

This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

**Usage guidelines**

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

**About Google Book Search**

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Library
of the
University of Wisconsin
PRESENTED BY
Mrs. William G. Haan

Library
of the
University of Wisconsin
PRESENTED BY
Mrs. William G. Haan

# NEW AMERICAN SUPPLEMENT

TO THE LATEST EDITION OF THE

# ENCYCLOPÆDIA BRITANNICA

A STANDARD WORK OF REFERENCE IN

ART, LITERATURE, SCIENCE, HISTORY, GEOGRAPHY
COMMERCE, BIOGRAPHY, DISCOVERY
AND INVENTION

EDITED UNDER THE PERSONAL SUPERVISION OF

DAY OTIS KELLOGG, D.D.

*Formerly Professor of English Literature and History, Kansas State University, etc., etc.*

ASSISTED BY A CORPS OF EXPERIENCED WRITERS

ENRICHED BY MANY HUNDRED SPECIAL ARTICLES CONTRIBUTED BY MEN AND WOMEN OF INTERNATIONAL REPUTATION

Illustrated with over Fifteen Hundred Portraits and Other Engravings

IN FIVE VOLUMES
VOLUME I

NEW YORK
THE WERNER COMPANY
CHICAGO
1898

COPYRIGHT, 1897
BY
THE WERNER COMPANY



AE
.EN3
.3
25

# PUBLISHERS' PREFACE.

EVERY encyclopædia has to confront, from the start, questions of plan and arrangement, involving the best method of putting its information before readers so that it shall render them the best service. There are but two expedients that have had any practical consideration; one may be called the library and the other the dictionary plan.

The dictionary plan consists in entering, for convenience in consultation, as many titles of articles as possible, and defining them as sententiously as possible. A book so made is essentially a lexicon, or glossary of terms, and nowadays we have come to have a class of dictionaries which, because of their definition of all sorts of technical, trade and patented terms, are, as they call themselves, encyclopædic. But a true encyclopædia is far more than a word-book. A word-book breaks all arts, sciences, philosophies, mechanisms and history into adjectives and nouns, and defines each separately. The difference is immense. For example, a man who knows all about a ship may be content with dictionary definitions of keels, stems, booms, strakes, etc., but the landsman has no acquaintance with these terms until he can turn to some account of ship-building, where he finds them used in a context that gives them intelligibility. Until he reads in this manner he does not even know the terms he needs to have defined. Now, an encyclopædia deals with events and things, rather than with words, and is therefore at once more elementary, as it is also more exhaustive and complete, than a dictionary. It is to help those who do not know what details or terms to look for. It is to explain processes, sequences, relations; and so the encyclopædia has a function far different from that which a dictionary can take up. The latter helps one to a ready understanding of what he has encountered in the world; the former takes him into new fields, and acquaints him with things he has not met with or anticipated.

Undoubtedly, the earliest design of an encyclopædia was to furnish students with a cheap, compact and universal library. At first, books were so expensive that students were unable to buy the special histories, commentaries and treatises published. The situation was not altered when books became cheaper; for industries and sciences and researches were multiplied and subdivided still faster. The encyclopædia then came, and offered, in a compendious way, the contents of thousands of volumes. It also grew rapidly in bulk, until, finally, the largest reference-book in the history of English literature appears in our thirty-volume edition of the ENCYCLOPÆDIA BRITANNICA. It contains nearly 12,000,000 more words than the most voluminous encyclopædic English dictionary extant, and thus illustrates the impossibility of taking into even an elaborate lexicon the historical, biographical, geographical, and statistical features of an encyclopædia.

THE ENCYCLOPÆDIA BRITANNICA was first published in 1771. Its proprietors announced it as on a new plan, the different sciences and arts being "digested into treatises and systems." It was a distinct adoption of the library plan, and it has been adhered to in all subsequent editions. The result is, that the edition here announced contains long articles that would make over fifty duodecimo volumes of 600 pages of small-pica print, each devoted to some special branch of art, theology, science, history, etc. The entire compass of this issue of the work would make 140 such volumes.

It is this library system that has constituted the strength and the weakness of the BRITANNICA,—the *strength*, because it lays under contribution a higher and more critical scholarship; the *weakness*, because the difficulty of referring to particular details or topics is increased. The testimony to its strength is unimpeachable, for it comprises the verdict of scholars and reading men the world over, indorsing its authority, and commending its skill of presentation and comprehensiveness as unapproached in any other English work of reference. The testimony also further indorses the fact that its pages are the storehouse from which other encyclopædias both replenish their columns and correct their errors. But beyond all this, it is indorsed triumphantly in the fact that more copies of the ninth edition of the BRITANNICA have passed into circulation, by scores of thousands, than of any other reference-book of contemporary sale.

A treatise has a law of art to govern its production; defining and explaining do not result in an art. Thus, were one to visit an inclosure in which were gathered all the material of a classic temple,—the stones and cements, the framing and the girders, the columns, keystones, capitals, molding and chiseled friezes,—it might instruct one to find each detail packed in barrels and cases, duly labeled, and assorted into piles, according to the alphabetical order of their labels. But such

instruction would be far inferior to that gathered from the study of the temple itself, with all its parts and members in place and order, exhibiting at once the architect's design and the constructor's skill. There is something, therefore, in "distinct treatises and systems" that must forever elude the definer. A writer, too, however skilled and accomplished, sacrifices his best qualities if he must break his subject into details and write them up separately for presentation under an arbitrary alphabetical arrangement.

It is, then, because of the library or treatise plan of the BRITANNICA, that its scholarship has been recognized as unsurpassed, its criticism as vital and lucid, its information as so varied and instructive. Let the plan stand, with all its splendid characteristics; a suitable system of reference is all that is needed to make the BRITANNICA stores of knowledge accessible. Thus, while keeping its own matchless qualities, it partakes of every convenience offered by the topical encyclopædias, that boast of needing no index.

After some years of experience with the book, having sold it all over the United States, and having learned in the operation what would best adapt it to the needs of the English-speaking world, THE WERNER COMPANY undertook to make this new edition (virtually the TENTH) of the ENCYCLOPÆDIA BRITANNICA. The aims sought are, to supplement the BRITANNICA as to bring all the developments of history, discovery, arts and sciences down to date; to extend biography as to include living men of distinction; to enlarge the view of American interests; and to supply references to the original text, making the whole work available for easy consultation.

The work was intrusted to an editor who had spent twelve years in the study of the BRITANNICA, about whom was gathered an office-staff of twenty and a special staff of sixty-seven persons, including heads of bureaus in Washington, army and navy officers, eminent theologians, college presidents and professors, women at the head of the best-managed reforms, educators, statesmen and specialists. Their names will be found in the front of each supplementary volume.

The features of this new WERNER EDITION of the BRITANNICA are as follows:

1. An exhibition, by means of copious cross-references, of all the matter usually found in encyclopædias, which is incorporated in the original text of the BRITANNICA. This was done, primarily, to indicate the completeness of the treatment of details in the original work, obscured by the treatise plan, and to show the reader how to find them; and secondly, to avoid repetitious handling of subjects, thus saving room for new matter.

2. An extension of the original articles on history, geography, discovery, pure and applied science, invention, politics, arts and literary and general criticism, down to the very day of publication.

3. The introduction of new topics, either arising from the differentiation of new departments of science; as, ECOLOGY, SENSE-ORGANS, SEGMENTATION OF THE VERTEBRATE BRAIN, etc.; or from discovery and invention; as, ARGON, ROENTGEN RAYS, KINETO-PHONOGRAPH, TESLA'S OSCILLATOR, SUBMARINE BOATS, etc.

4. Biographical enlargement, to cover eminent living persons, and the hundreds who have recently won distinction, of whom this edition sketches, under the authority of personal correspondence, many whose names appear in no other work of reference.

5. A particular survey of American interests in their latest phases.

6. A presentation of technical subjects in a form comprehensible to ordinary readers, as in the treatment of ELECTRICITY, MORPHOLOGY, etc.

7. A method of copious illustrations, amounting in number to fifteen hundred, including likenesses of notable persons, seals and capitols of states, college and university buildings, architectural structures in great cities, monumental work, and figures and diagrams exhibiting mechanisms and results of biological research.

8. A system of treating subjects by departments, so that large groups passed under the charge of specialists. Among others, THE WERNER COMPANY especially acknowledges the services of C. H. Cochrane, M.E., in Mechanisms, Dr. John M. Coulter in Botany, G. Mercer Adam in Literary Biography, Hon. C. D. Wright and Dr. John M. Finley in Sociological Questions, Hon. John Sherman in United States Finances, Dr. John Bach McMaster in Political Organizations, Dr. W. A. Locy in Zoölogy, Dr. Alexander Smith in Chemistry, Dr. S. W. Stratton in Electricity, Dr. B. A. Hinsdale in Education, and Mrs. Ellen M. Henrotin in the Advancement of Women. The systematic work of these departmental coadjutors will be found invaluable.

9. The last word that has yet been said on every theme of general or special interest.

10. It is claimed for this SUPPLEMENT that it will give new value to sets of all British and American editions heretofore bought, as well as bring them down to a later date than any other encyclopædia extant. The aim of THE WERNER COMPANY has been to put upon the market a work superior to and more recent than any work of reference in the language. Its articles are made as popular in style as fidelity to truth will permit, and, in any event, on no point of vital importance are its pages to be surpassed.

# PARTIAL LIST OF CONTRIBUTORS

## TO THE NEW AMERICAN SUPPLEMENT.

[ENCYCLOPÆDIA BRITANNICA.]

---

G. MERCER ADAM, founder of *The Canadian Monthly;* formerly editor of *The Canada Educational Monthly;* author of *Life of Sir John A. Macdonald*, etc.; and Editor of *Self Culture* (magazine), Chicago, Ill.

REV. P. A. BAART, A.M., of the Diocese of Detroit.

ALBERT S. BOLLES, LL.D., author of *Financial History of the United States*, etc.

WALTER CAMP, author of *Football, Facts and Figures*, etc.

JOHN F. CARGILL, formerly U. S. Deputy Mineral Surveyor, author of *A Freak in Finance*, etc.

J. I. CASE, J. I. Case Threshing-Machine Company.

CHARLES F. CLARK, President of the Bradstreet Company.

CHARLES H. CLARK (CAPT.), assistant ordnance officer, War Department, Washington, D.C.

JAMES B. CLOW, Sanitary Expert, Chicago, Ill.

CHARLES HENRY COCHRANE, M.E., author of *Artistic Homes, and How to Decorate Them; The Wonders of Modern Mechanism* (1896); etc.

LYMAN E. COOLEY, C.E., Engineer United States Deep Waterways Commission; formerly Chief Engineer and member Board of Trustees of the Sanitary District of Chicago; etc.

JOHN M. COULTER, LL.D., Head Professor of Botany, University of Chicago.

CARL A. DANIELL, Editor *Presto*, Chicago, Ill.

JOHN H. FINLEY, PH.D., President Knox College, Galesburg, Ill.

D. W. FLAGLER (BRIG.-GEN.), Chief of Ordnance, Washington, D.C.

JAMES CARDINAL GIBBONS, Baltimore, Md.; Primate of the Roman Catholic Church in America.

ALBERT G. GLOVER, Editor *Engraver and Printer*, Boston, Mass.

A. W. GREELY (BRIG.-GEN.), Arctic explorer, Chief Signal-Officer, Washington, D.C.

HENRY F. GRIERSON (CAPT.), Specialist in Irrigation, etc., Rochester, N.Y.

BAIRD HALBERSTADT, Mining Engineer and Geologist; member of Pennsylvania Board of Examiners; etc.

W. E. HALE, inventor of the Hale Elevator, etc.

MARK W. HARRINGTON, LL.D., President of the University of Washington, Seattle, Wash.; formerly Chief of United States Weather Bureau.

HENRY E. O. HEINEMANN, Journalist, Chicago, Ill.

ELLEN M. HENROTIN, President General Federation of Women's Clubs.

B. A. HINSDALE, PH.D., LL.D., Professor of the Art and Science of Teaching, University of Michigan.

EMIL G. HIRSCH, D.D., Professor of Semitic Languages in the University of Chicago; Rabbi Sinai Congregation, Chicago; member Board of Directors Chicago Public Library; etc.

SHEPPARD HOMANS, Consulting Actuary; First President Actuarial Society of America, and Corresponding Secretary London Institute of Actuaries, New York.

A. W. HULING, Editor *The Argus*.

E. W. HUNTINGFORD, M.A., Professor of Classics, Trinity University, Toronto, Canada.

ALBERT E. HYDE, Sanitary Expert, etc., Chattanooga, Tenn.

FRANKLIN JOHNSON, D.D., Professor, Divinity Department, University of Chicago.

J. H. S. JOHNSTONE, Editor *The Horseman*.

J. THOMAS KELLEY, JR., M.D., Washington, D.C.

DAY OTIS KELLOGG, D.D., Editor New Supplement to the ninth edition of the ENCYCLOPÆDIA BRITANNICA; formerly Professor of English Literature and History, Kansas State University.

FRANCIS E. LEUPP, Board of Indian Commissioners, Department of the Interior, Washington, D.C.

WILLIAM ALBERT LOCY, PH.D., Professor of Zoölogy, Northwestern University, Evanston, Ill.

BENJAMIN A. MACDONALD, formerly Editor *The Billiard Mirror*.

ROBERT CRAIK MCLEAN, Editor *Inland Architect*, Chicago, Ill.

JOHN BACH MCMASTER, C.E., PH.D., Professor of American History, University of Pennsylvania; author of *A History of the People of the United States from the Revolution to the Civil War*, etc.

JOHN P. MEANY, Editor *Poor's Manual of Railroads*, New York.

G. W. MELVILLE (COMMODORE), Engineer-in-Chief, United States Navy, Washington, D.C.

NELSON A. MILES (MAJ.-GEN.), Commanding the Army of the United States, Washington, D.C.

JOHN J. MITCHELL, President Illinois Trust and Savings Bank, Chicago.

WILLIAM F. MORSELL, PH.D., Assistant Director United States Geological Survey, Department of the Interior, Washington, D.C.

J. STERLING MORTON, Secretary of Agriculture, Washington, D.C.

MARY E. MUMFORD, Member of Philadelphia Board of Education, and Vice-President General Federation of Woman's Clubs.

SIMON NEWCOMB, LL.D., F.R.S., Professor of Mathematics and Astronomy, Johns Hopkins University; Superintendent of the *Nautical Almanac*, United States Navy Department, etc., Washington, D.C.

S. N. D. NORTH, Secretary of National Association of Wool Manufacturers, Boston, Mass.

FRED. PABST, President Pabst Brewing Company.

FRED LEWIS PATTEE, M.A., Professor of English and Rhetoric, Pennsylvania State College; author of *A History of American Literature*, etc.

ROSSITER W. RAYMOND, PH.D., Mining Engineer and Metallurgist; Secretary of the American Institute of Mining Engineers, New York.

THOMAS B. REED, Speaker Fifty-first and Fifty-fourth Congresses, etc., Washington, D.C.

JOHN SHERMAN, Ex-Secretary of the Treasury; United States Senator from Ohio; Secretary of State, etc.

ALEXANDER SMITH, PH.D., Assistant Professor of General Chemistry, University of Chicago.

A. G. SPALDING, First Captain Chicago Baseball Club, etc.

JOHN F. STEWARD, Deering Harvester Company.

MELVILLE E. STONE, General Manager Associated Press.

S. W. STRATTON, PH.D., Ryerson Physical Laboratory, University of Chicago.

CHARLES H. THORNTON, *Daily Commercial Record*, Duluth, Minn.

R. H. THURSTON, LL.D., Director of Sibley College, and Professor of Mechanical Engineering, Cornell University.

E. C. TOWNE (Yale, '56), Chicago, Ill.

HENRY C. WALLACE, Editor *The Creamery Gazette*, Des Moines, Iowa.

FRANCES E. WILLARD, LL.D., President of the World's and National Women's Christian Temperance Union, Evanston, Ill.

W. D. WILLES, Press Club, New York.

EDWARD L. WILSON, Editor *Wilson's Photographic Magazine;* author of *Quarter-Century in Photography*.

J. L. WITHROW, D.D., LL.D., Moderator of the General Assembly of the Presbyterian Church in the United States.

DE VOLSON WOOD, PH.D., Professor in Stevens Institute, Hoboken, N.J.

CARROLL D. WRIGHT, LL.D., United States Commissioner of Labor, Washington, D.C.

# ILLUSTRATIONS

IN THIS VOLUME.


PAGE.

Albert Memorial, London ---- 115
American Surety Co.'s Building, New York ---- 224
Antheridium ---- 194
Apical Cell ---- 203
Apisides ---- 210
Archegonium ---- 217
Archesporium ---- 218
Auditorium Building, Chicago ---- 224
Bacterial Forms ---- 311
Baseball-Field, Diagram of ---- 371
Beehives and Beehouses ---- 398
Bell of Moscow, The Great ---- 413
Bellevue Hospital, New York ---- 411
Bicycle, Modern Safety ---- 458
Bison, The American ---- 479
Boston Public Library ---- 528
British Museum, The ---- 576
Bruges Belfry ---- 406
Bunker Hill Monument ---- 621
Capitol at Washington, D. C. ---- 224
Chronicle Building, San Francisco ---- 224
City Hall, Baltimore ---- 331
City Hall, Phœnix, Arizona ---- 231
Elevation of Administration Building, Chicago ---- 224
Exchange Building, Kansas City ---- 224
Faneuil Hall, Boston ---- 527
Fisher Building, Chicago ---- 224
Fort Street Union Depot, Detroit ---- 224
Grand Central Passenger Depot, Chicago ---- 224
Hotel Ponce-De-Leon, St. Augustine ---- 224
Hotel Waldorf, New York ---- 224
Liberty Enlightening the World, New York ---- 397
Masonic Temple, Chicago ---- 224
Mills Building, SanFrancisco ---- 224
Modern Beehive ---- 399
Newberry Library, Chicago ---- 224
Residence, St. Joseph, Mo. ---- 224
Residence, St. Louis ---- 224
Residence, St. Louis ---- 224
Schiller Building, Chicago ---- 224
State, War, and Navy Department Building, Washington, D. C. ---- 224
The Brandenburg Gate, Berlin ---- 431
The Reichstag Building, Berlin ---- 430
The Rookery, Chicago ---- 224
The Treasury Building, Washington, D. C. ---- 224
Trinity Church, Boston ---- 224
Union Trust Company's Building, St. Louis ---- 224
United States Custom House and Postoffice, Chicago 224


## STATE AND TERRITORIAL SEALS.


PAGE.

Alabama ---- 107
Alaska ---- 109
Arizona ---- 230
Arkansas ---- 232


## STATE CAPITOL BUILDINGS.


Albany, New York ---- 113
Annapolis, Maryland ---- 190
Austin, Texas ---- 292
Baton Rouge, Louisiana ---- 379


## COLLEGE AND UNIVERSITY BUILDINGS.


Adelbert College, Cleveland, Ohio ---- 47
University of New Mexico, Albuquerque ---- 116
Amherst College, Massachusetts ---- 166
Beloit College, Wisconsin ---- 414
Bowdoin College, Brunswick, Maine ---- 536
Brown University, Providence, Rhode Island ---- 595
Bryn-Mawr College, Pennsylvania ---- 602


## PORTRAITS.


Abbott, Lyman, ---- 15
Aberdeen, John Hamilton Gordon, Seventh Earl of ---- 26
Abert, John James ---- 26
Abdul-Hamid II ---- 24
Adams, Abigail Smith ---- 42
Adams, Charles Francis ---- 43
Adams William ---- 45
Agassiz, Alexander ---- 84
Albani, Madame ---- 113
Alboni, Marietta ---- 116
Alcott, Louisa May ---- 118
Aldrich, Thomas Bailey ---- 119
Alexander III ---- 121
Alexandra, Princess of Wales ---- 122
Allen, Ethan ---- 129
Allibone, Samuel Austin ---- 133
Allison, William B ---- 134
Allston, Washington ---- 136
Alma-Tadema, Lawrence ---- 137
Ames, Edward Raymond ---- 167
Andersen, Hans Christian ---- 178
Anderson, Robert ---- 179
Andrassy, Julius, Count ---- 181
Andrew, John Albion ---- 181
Andrews, Edward Gayer ---- 182
Andrews, Elisha Benjamin ---- 182
Angell, James Burrill, ---- 186
Anthony, Henry Bowen ---- 195
Anthony, Susan Brownell ---- 195
Appleton, Daniel Sidney ---- 208
Arabi Pasha, Ahmed-El-Houssian ---- 213
Argyll, George Douglas Campbell, Duke of ---- 228
Arnold, Benedict ---- 242
Arnold, Matthew ---- 244

| | Page. |
|---|---|
| Arthur, Chester Alan | 250 |
| Asbury, Francis | 261 |
| Asquith, Herbert Henry | 267 |
| Astor, William Waldorf | 272 |
| Atkinson, Edward | 280 |
| Atwater, Wilbur O | 285 |
| Auerbach, Berthold | 288 |
| Aumale, Henri Eugène Philippe Louis d'Orléans, Duc d' | 290 |
| Austin, Alfred | 293 |
| Bagehot, Walter | 316 |
| Bainbridge, William | 320 |
| Baird, Spencer Fullerton | 321 |
| Baker, Sir Samuel White | 322 |
| Balfour, Arthur James | 326 |
| Ball, Thomas | 327 |
| Bancroft, George | 334 |
| Banks, Nathaniel Prentiss | 343 |
| Baring-Gould, Sabine | 354 |
| Barnard, Frederick Augustus Porter | 357 |
| Barney, Joshua | 359 |
| Barnum, Phineas Taylor | 359 |
| Barr, Amelia Edith | 360 |
| Barrie, James Matthew | 362 |
| Bartholdi, Frédéric Auguste | 365 |
| Barton, Clara | 367 |
| Bascom, John | 370 |
| Bayard, Thomas Francis | 384 |
| Beaconsfield, Earl of (Benjamin Disraeli) | 388 |
| Beauregard, General, Pierre Gustav Toutant de | 393 |
| Beecher, Henry Ward | 400 |
| Beecher, Lyman | 401 |
| Bell, Alexander Graham | 408 |
| Belmont, August | 413 |
| Benjamin, Park | 420 |
| Bennett, James Gordon, Jr. | 421 |
| Benson, Edward White, Archbishop | 422 |
| Benton, Thomas Hart | 423 |
| Bernhardt, Rosine (Sarah) | 433 |
| Berthelot, Pierre Eugène Marcelin | 435 |
| Besant, Walter | 436 |
| Bidwell, John | 462 |
| Bigelow, John | 464 |
| Bismarck-Schönhausen, Prince von | 478 |
| Björnson, Björnstjerne | 481 |
| Blackmore, Richard Doddridge | 486 |
| Blaine, James Gillespie | 489 |
| Blouet, Paul ("Max O'Rell") | 502 |
| Boies, Horace | 509 |
| Bonaparte, Elizabeth Patterson | 515 |
| Bonheur, Marie Rosalie (Rosa) | 517 |
| Boone, Daniel | 520 |
| Booth, Edwin Thomas | 521 |
| Booth, William | 522 |
| Boucicault, Dion | 531 |
| Bourget, Paul | 534 |
| Boutwell, George Sewall | 535 |
| Bowen, Henry Chandler | 537 |
| Boyesen, Hjalmar Hjorth | 540 |
| Bradley, Joseph P | 545 |
| Breckinridge, John Cabell | 556 |
| Brewer, David Josiah | 559 |
| Briggs, Charles Augustus | 570 |
| Brinton, Daniel Garrison | 572 |
| Brooks, Phillips | 584 |
| Brown, Joseph Emerson | 590 |
| Browning, Robert | 592 |
| Bryan, William Jennings | 600 |
| Bryant, William Cullen | 601 |
| Bryce, James | 602 |
| Buchanan, Robert William | 604 |
| Buckingham, William Alfred | 605 |
| Buckner, Simon Bolivar | 606 |
| Buell, Don Carlos | 608 |
| Bull, Ole Bornemann | 616 |
| Bulow, Hans Guido von | 620 |
| Bunner, Henry Cuyler | 622 |
| Burdett-Coutts, Angela Georgiana, Baroness | 624 |
| Burnett, Frances Hodgson | 629 |
| Burnside, Ambrose Everett | 631 |
| Burr, Aaron | 631 |
| Burroughs, John | 633 |
| Burton, Sir Richard Francis | 634 |
| Butler, Benjamin Franklin | 636 |

# CONTRIBUTIONS FROM SPECIAL WRITERS

## IN THIS VOLUME.

ACCIDENT OR CASUALTY INSURANCE IN THE UNITED STATES
A. H. HULING, Editor *The Argus*.

AFRICA.
E. C. TOWNE, Yale, '56.

AGRICULTURAL EXPERIMENT STATIONS.
ARMINIANISM.
BAPTISTS IN THE UNITED STATES.
BROWNING, ROBERT.
BULL RUN.
D. O. KELLOGG, D.D., formerly Professor of English Literature and History, Kansas State University; and Editor of this Supplement.

AGRICULTURE IN THE UNITED STATES.
J. STERLING MORTON, Secretary of Agriculture, Washington, D.C.

ALTERNATION OF GENERATIONS.
ANCESTRY OF PLANTS, OR PHYLOGENY.
BACTERIOLOGY.
JOHN M. COULTER, LL.D., Head Professor of Botany, University of Chicago.

AMERICAN LITERATURE.
FRED LEWIS PATTEE, M.A., Professor of English and Rhetoric in the Pennsylvania State College; author of *A History of American Literature*, etc.

AMERICAN PARTY, OR NATIVE AMERICAN AND KNOW-NOTHING.
JOHN BACH MCMASTER, C.E., PH.D., Professor of American History, University of Pennsylvania; author of *A History of the People of the United States from the Revolution to the Civil War*, etc.

AIR-COMPRESSORS, AND USES OF COMPRESSED AIR.
ANENOMETER.
APARTMENT-HOUSES.
ARMATURE.
ATHLETIC TRAINING AND APPARATUS.
AUTOMOBILE VEHICLES AND MOTOR-CARRIAGES.
BICYCLE-MANUFACTURE.
BICYCLE RAILWAYS.
BRAKE.
BRICKS AND BRICKMAKING.
BUILDING-STONES.
BUOYS.
BURNERS FOR LAMPS.
CHARLES HENRY COCHRANE, M.E., author of *The Wonders of Modern Mechanism* (1896); *Artistic Homes, and How to Decorate Them;* etc.

AQUEDUCTS.
LYMAN E. COOLEY, C.E., Engineer United States Deep Waterways Commission; formerly Chief Engineer and member Board of Trustees of the Sanitary District of Chicago; etc.

ARCHITECTURE (AMERICAN).
ROBERT CRAIK MCLEAN, Editor *Inland Architect*.

ARTILLERY IN THE UNITED STATES.
D. W. FLAGLER (Brig.-Gen.), Chief of Ordnance, U.S.A.
C. H. CLARK, Captain of Ordnance Department, Washington, D.C.

ASTRONOMY.
SIMON NEWCOMB, LL.D., F.R.S., Superintendent of the *Nautical Almanac*, United States Navy Department; Professor of Mathematics and Astronomy in the Johns Hopkins University; etc.

ATONEMENT.
FRANKLIN JOHNSON, D.D., Professor, Divinity Department, University of Chicago.

BANKING IN THE UNITED STATES.
ALBERT S. BOLLES, LL.D.; author of *Financial History of the United Seates*, etc.

BASEBALL.
A. G. SPALDING, First Captain Chicago Baseball Club, etc.

BENEFIT SOCIETIES (MUTUAL).
BUILDING AND LOAN ASSOCIATIONS.
CARROLL D. WRIGHT, LL.D., United States Commissioner of Labor.

BILLIARDS.
BENJAMIN A. MACDONALD, formerly Editor of *The Billiard Mirror*.

BREWING.
FRED. PABST, President Pabst Brewing Company.

BRITISH COLUMBIA.
G. MERCER ADAM, founder of *The Canadian Monthly;* formerly editor of *The Canada Educational Monthly;* author of a *Life of Sir John A. Macdonald*, etc.; and Editor *Self Culture* (magazine).

*For other articles by these, and many other contributors, of prominence, see Vols. II, III, IV and V, of this Supplement.*

# NEW AMERICAN SUPPLEMENT

TO THE

# ENCYCLOPÆDIA BRITANNICA.

## AACHEN—AARIFI PASHA

AACHEN, same as AIX-LA-CHAPELLE, Vol. I, p. 432.

AAGESEN, SVEND, a Danish historian, who at the beginning of the thirteenth century wrote a history of Denmark down to 1187.

AALESUND, a coast town in the province of Romsdal, Norway, built on three small islands. Population (1891) 8,406.

AALI PASHA, MEHEMED EMIN, a distinguished Turkish statesman, born in 1815; entered the Turkish foreign office in 1830; Turkish ambassador at London in 1841–44; appointed minister of foreign affairs in 1845, serving as such three terms between 1846 and 1853. He became chancellor of the divan in 1845, pasha in 1856, and grand vizier in 1852, holding this latter position several times. He was closely identified with the reforms in the government of the Ottoman empire under the sultans Abdul Medjid and Abdul Aziz. He represented the Porte at the conferences of Vienna and Paris in 1855, and signed the Treaty of Paris in 1856. He presided at the conference of the European powers called to settle the Roumanian difficulties in 1864. During the absence, in 1867, from Constantinople, of the Sultan, who was engaged in making a tour of the Continent, Aali Pasha acted as regent of the empire, and was active in suppressing the Cretan rebellion in 1867–68, and in repressing the efforts of the Egyptians to escape from the supremacy of the Porte. He died Sept. 6, 1871.

AALL, JAKOB, a Norwegian historian and statesman, was born at Porsgrund July 27, 1773. While studying divinity at Copenhagen he became interested in the pursuit of natural science, and in 1797 he set out to make the tour of the scientific schools of Leipsic, Kiel and Göttingen. In Germany he became acquainted with the great geologist, Werner; and in 1799, having spent the winter at the celebrated academy of mines in Freiberg, he returned to Norway and invested his patrimony in the purchase of the immense iron-works of Naes, in the Arendal ore region. In 1814 he took a prominent part in the framing of the free constitution of Norway, and for 14 years, 1816–30, he was a leading member of the Storthing. In 1832–36 he published, in three volumes, entitled *Present and Past*, a redaction of his own numerous magazine articles on the history and antiquities of Norway. In 1838–39 appeared his standard translation of Snorre Sturleson's *Heimskringla*. His *Reminiscences* (1844–45) is a repository of data concerning the contemporaneous history of the Scandinavian peninsula. Died Aug. 4, 1844.

AALTEN, a town in the province of Gelderland, Netherlands, about 30 miles east of Arnhem, on the river Aar. Population (1891) 7,030.

AAM, AUM or AWM, a Dutch liquid measure of varying value. The standard or Amsterdam aam is 41 gallons for wine and about 38 gallons for oil. The aam is in limited use in other continental countries, in some of which it shrinks in capacity to about 36 gallons. In Germany it is written *ahm*, and sometimes, though erroneously, *ohm*.

AARESTRUP, CARL LUDWIG EMIL, Danish physician and poet, born Dec. 4, 1800. A volume of his poems was published in 1838, and another posthumously in 1863. He died in 1856.

AARIFI PASHA, a Turkish statesman, born in Constantinople in 1830. He entered the diplomatic service at an early age, accompanying his father, Shekib Pasha, on a mission to Rome in 1847. Turning his attention to one of the chief requirements of a diplomatist, linguistic attainments, he successively filled minor and gradually more im-

portant posts in the European embassies of his country. For many years he was the first translator in the divan. Subsequently he was appointed under-secretary of state for foreign affairs, holding at the same time three other important portfolios in the ministry. He became minister of public instruction in 1874, minister of justice, and later ambassador at Vienna. The futile reform constitution of November, 1876, brought Aarifi to the front as president of the senate for a brief period. He was Ottoman ambassador in Paris in 1877, becoming prime minister for a brief period in 1879.

AARON, SAMUEL, a Baptist clergyman and educator, born at New Britain, Pennsylvania, in 1800. Ordained in 1829. Established an enviable reputation as a teacher in Treemount Seminary, near Norristown, Pennsylvania, and in the Mount Holly Institute in New Jersey. He was also the author of various text-books. He died April 11, 1865.

AARON BEN ASHER, a Jewish scholar living at Tiberias in the tenth century. He completed the Masora (the accents and vowels) of the Hebrew Bible. His codex, named after him, was preserved at Berea.

AARON'S BEARD, a vernacular name applied to at least four widely different species of plants: (*a*) *Saxifraga sarmentosa*, a Chinese plant in common cultivation, with alternate bright and hairy leaves on long, drooping stems; (*b*) *Hypericum calycinum*, a dwarf evergreen shrub of southeastern Europe, with conspicuous flowers and clusters of long hair-like stamens, which suggest the name; (*c*) *Rhus cotinus*, the common "smoke tree," whose flowers are mostly abortive and their pedicels lengthen and branch, bearing long plumy hairs, making feathery clusters; (*d*) *Geropogon hirsutus*, a plant of Southern Europe, with purplish head and plumy pappus.

AARS, JACOB JONATHAN, Norwegian linguist, born in Christiania, July 12, 1837. He wrote an old Norse grammar, and rendered tales and songs of that speech into modern Norwegian.

AASEN, IVAR ANDREAS. See NORWAY, Vol. XVII, p. 592.

AASVÆR, a group of Norwegian islands. See VÆRO, in these Supplements.

AB, a Jewish month. See CALENDAR, Vol. IV, pp. 678, 681.

ABACO, the largest of the Bahama Islands. Length, 80 miles, area, 96 sq. miles; lat. 26° 18′ N., long. 76° 57′ W. Its chief town is Carleton. It is also called Great Abaco and Lucaya. Little Abaco lies west of the northern portion of Abaco.

ABAD, a dynastic title applied to several of the Moorish kings in Spain. Abad I, the first Moslem king of Seville, reigned 1023–42. The last of the dynasty, Abad III, died in 1095.

ABAD OR ABADIANO, DIEGO JOSÉ, a Mexican poet and Jesuit, born near Jiquilpan, Mexico, July 1, 1727, was rector of the college of Queretaro, where he studied and practiced medicine. Later he went to Italy, where he published a volume of heroic verses concerning God, in Latin, to which his fame is principally due. It was in cantos and went through several editions. He also wrote a book describing the principal rivers of the world. Died in Barcelona, Spain, Sept. 30, 1779.

ABADDON, a Hebrew word used in rabbinical legends to denote the deepest place in hell. As used in Rev. ix, 2, it denotes the angel of the abyss, the bottomless pit.

ABAFFY OR ABAFFI, MIHALY. See APAFI, in these Supplements.

ABALONE, a name used on the coast of California to designate gasteropod mollusks of the genus *Haliotis*. They are edible, and great quantities are dried and exported for use as food. The shell, commonly known as ear-shell, is used in inlaying and other ornamental work.

ABANA, now the Barada, a river of Syria having its source in the Antilibanus, some 23 miles from Damascus, through which city it flows, losing itself in the lake or marsh Bahret-el-Kibliyeh. It is mentioned in 2 Kings v, 12, as one of the rivers of Damascus, with the Pharpar, now known as the Awab.

ABANCOURT, CHARLES XAVIER JOSEPH FRANQUEVILLE D', a minister of war to Louis XVI of France, in 1792. Born at Douai, 1758; murdered by a mob at Versailles, Sept. 9, 1792. He was a nephew of Calonne, and an ardent royalist.

ABARBANEL. See ABRABANEL, Vol. I, p. 52.

ABARCA, JOAQUIN, a bishop and leader of the absolutist party of Spain, born in 1780. He became prime minister of Don Carlos, but, falling into disfavor, was banished, and died in 1844.

ABARIM, a range of mountains on the east side of the Jordan, opposite Jericho, in the land of Moab. These mountains have an elevation of nearly 3,000 feet above the Mediterranean, and more than 4,000 feet above the Dead Sea. The summit of the range was formerly supposed to be level, but recent explorers have found considerable inequalities of surface. Mount Nebo, the highest point, and still called Mount Neba or Nebbah, is believed to be the point from which Moses obtained his view of Palestine.

ABASCAL Y SOUSA, JOSÉ FERNANDO, a Spanish general and statesman; born at Oviedo, Asturias, June 3, 1743. He was viceroy of Peru 1804–16; was created Marquis de la Concordia Española del Peru in 1812, and was made captain-general on his return to Spain. He died in Madrid, July 31, 1821.

ABASIA. See ABKHASIA, Vol. I, p. 50.

ABATEMENT, in heraldry, is the term commonly applied to a mark of dishonor across a coat of arms. Abatement is also a term used in legal matters. Abatement of legacies occurs when the estate of the testator is insufficient to pay his debts and the legacies in full. When the estate is not sufficient to pay both debts and legacies, it is the rule that the general legacies must abate proportionately for the purpose of paying the debts. After the exhaustion of the general legacies and the remainder of the estate, the specific legacies will be abated proportionately for the payment of debts. Abatement in pleading defeats the action, unless the defect be such that it can be cured by amendment, but does not bar the plaintiff from recommencing his suit, and thus, if possible, avoiding the defect. A plea in abatement, as it is dilatory in its nature and does not go to the merits of the controversy, is not favored by the courts, and must be drawn with the greatest accuracy, and is not amendable. It must be presented at the earliest

opportunity, before any plea to the merits, in both civil and criminal actions, unless the matter pleaded in abatement arises subsequently. Generally, a plea in abatement must be accompanied by affidavit of the truth of the facts pleaded. Pleas denying the jurisdiction of the court are usually classed with pleas in abatement, but are not strictly such. In many states, such pleas are considered meritorious and are amendable to almost the same extent as other pleadings. Abatement in suits in chancery is the suspension of all proceedings in the suit for want of proper parties. Abatement of a nuisance may be accomplished by a removal or destruction, by the party injured, of the nuisance with the least possible damage and disturbance, but the more usual and efficient remedy is by proceedings in equity to restrain the maintenance of the nuisance, or command its destruction. The right to invoke the aid of a court of equity to abate a nuisance will be barred by unnecessary delay or acquiescence. The maintenance of a public nuisance is, in many cases, an indictable offense. See ABATEMENT, Vol. I, p. 5.

ABATTIS (FR.) See FORTIFICATION, Vol. IX, p. 422.

ABAT-VOIX, a sounding-board placed over a pulpit or the head of a speaker to throw the voice toward the audience.

ABAUJVAR or ABAUJ, a county of Hungary. Area, 1109 sq. miles. Bounded by the counties of Borsod, Torna, Zemplin, Saros and Zips. Its chief town is Kaschau, and its population (1890) 165,000. The country is mountainous, and the soil specially favorable for grape culture. Gold, silver, iron and copper are among its mineral products.

ABBADIE, ANTOINE THOMSON D', a traveler and explorer, born in Dublin, Ireland, Jan. 3, 1810; was educated in France, and from 1837 to 1848 made extensive explorations in Abyssinia and Upper Egypt. On his return he published a catalogue of Ethiopian MSS., the *Géodésie d'une partie de la Haute-Éthiopie* (1860–73) and a Dictionary of the Amarinna (Amharic) language.

ABBADIE, ARNAUD MICHEL D', brother of Antoine, was born in Dublin, July 24, 1815. He accompanied his brother on his travels and on their return published the *Douze Ans dans la Haute-Éthiopie*.

ABBAS, ABBAS-IBN-ABD-IL-MOOLTALIB, the paternal uncle of Mohammed, and the progenitor of the dynasty of Abbasides; born at Mecca, 566. He opposed Mohammed at first, but, subsequently becoming converted, became one of the principal promoters of the Mohammedan religion. Died in 652.

ABBAS PASHA, viceroy of Egypt, and a grandson of Mehemet Ali; born at Jiddah, in Arabia, in 1813. He ascended the viceregal throne at Cairo on the death of his uncle, Ibrahim Pasha, in 1848. He was a bigoted, indolent and sensual ruler, bitterly opposed to foreigners and their civilization. He was found dead, probably murdered, July 13, 1854, and was succeeded by his uncle, Said Pasha. See EGYPT, Vol. VII, p. 766.

ABBAS HILMI, Khedive of Egypt, is the eldest son of the late Tewfik Pasha. He was born July 14, 1874, and succeeded his father Jan. 7, 1892, when he was 18 years of age. He had received some portion of his education, with his brother Mehemet Ali, at the Theresianum Academy in Vienna, and was there when his father died. His attitude toward the British administrative control of Egypt is considered unfriendly. He married one of his slaves in 1895.

ABBATO, NICCOLO DELL'. See ABATI, Vol. I, p. 5.

ABATTOIRS, ECONOMICAL SYSTEM OF. Since the slaughter of animals for food products has been almost entirely performed in the abattoirs of the great packing centers, the utilization of the offal, or portions of the animal formerly allowed to go to waste, has become a matter of great importance. About one third of the weight of an animal consists of products that cannot be eaten; and when it is known that in excess of thirty thousand animals have been slaughtered in a single day in the abattoirs of Chicago alone, the importance of utilizing this great amount of refuse will be seen. At the present time use is found for every part of the animal slaughtered, and the entire amount of offal is converted into a mercantile commodity by processes adopted within recent years. A considerable sum is realized from the sale of these products, made from the portions of the animal formerly unused, and this fact has contributed largely to keeping the price of the edible parts within the reach of all classes, many of whom would be deprived of meat as a regular food if this utilization were not effected.

To follow the process of slaughtering an ox will illustrate the manner in which the different portions are converted into products ready for the market. The animal is killed by a blow of a hammer upon the skull, and immediately seized by hooks attached to its hind legs, and suspended, head down, by a chain fastened to a pulley, that permits the carcass to descend of its own weight along an inclined rail. It thus passes in succession before a gang of workmen, each of whom performs a different operation. The first cuts, with a stroke of a knife, the jugular vein and carotid artery, whence the blood escapes and flows over a scrupulously clean floor into reservoirs. When the blood is cold it coagulates, and the fluid portion, which contains the soluble salts, is liberated. This is used for sizing paper. The solid part is prepared for a number of purposes, among which the most important is that of fertilization, a use for which it is especially valuable. The blood is sometimes placed in huge vats and about 70 per cent of the bulk evaporated. The residuum is then placed in hydraulic presses, and more moisture driven off in this manner. The solid cakes are then reduced to a fine powder by attrition, which is mixed with potash and phosphoric acid, making a fertilizer rich in plant-food. Ordinary blood contains about 17 per cent of ammonia, and of this about 13 per cent is pure nitrogen. The best qualities of blood are used for the refining of sugar. When desired for this purpose it is dried at a low temperature, in order to prevent the coagulation of the albumen. These cakes are dissolved in warm water and added to the liquid sugar. As an increasing heat is applied the albumen rises as a scum, carrying with it

the impurities in the sugar. The syrup is then filtered through bone-black, another product of the slaughter-house, being made of calcined bones. The inferior qualities of blood are employed in the manufacture of buttons, being pressed into shape by hydraulic machinery. Imitation tortoise-shell articles are also composed largely of blood. Defibrinated blood is now extensively used as a medicine, where the blood lacks the red corpuscles. The blood of an average ox will weigh about 40 pounds, and the amount realized from the sale of blood by the slaughter-houses averages from $35 to $45 per ton.

Other workmen in succession cut off the animal's head, skin the legs and cut them off, split and remove the skin, when it is conveyed to another gang, who prepare it for conversion into leather. Others seize the internal portions of the animal, separate the parts which are to go to the different rooms as food, from those which enter into the composition of fertilizers, and those to be converted into oil, thence into margarine or butterine. During these operations water flows in abundance along the floor, composed of gutters and containing numerous apertures. Through these the water, charged with detritus of all sorts, runs into reservoirs, from which the solid parts are taken and mixed with fertilizers, after being first dried and pressed. Previous to the removal of these solids from the vats the water is skimmed, and the fat and particles of meat sold to the manufacturers of soap, candles and axle-grease. The water is then evaporated to preserve whatever else may remain, and the residue mixed with fertilizers, the final asylum of all that cannot be otherwise utilized. The edibility of the stomach in the form of tripe is well known. The bladder is dried and sold to druggists and snuff-makers, while brewers and gold-beaters secure certain of the intestines, which are prepared especially for them. Brewers use one intestine, about seven or eight centimeters in diameter and about forty in length, to line pipes, so as to prevent the beer's contact with the metal. The intestines are glued end to end until sufficient length is secured for the desired purpose. Gold-beaters use the intestine as a receptacle for the sheets of gold already beaten to a film, but when placed between sheets of this parchment-like substance, as it is when dried and prepared, they reduce the gold to a thickness estimated at one ten-millionth of a millimeter. One of the membranes of the large intestine of the ox is used by surgeons in closing wounds and in making plasters. Other uses, as casings for sausage, etc., are well known. The paring of the skin, the ears, a portion of the tail, the feet, the muzzle, the bones that cannot be otherwise employed, such as those of the skull and jaws, the interior of the horns, are all employed for the manufacture of glue and gelatine. The latter is the same product as the former, but more carefully made of selected materials. In using the parts named for the above purpose they are first depilated by the use of lime, which is afterward neutralized by sulphuric acid and the mass separated from impurities by washing. Where bones are employed for the manufacture of gelatine they are first treated with hydrochloric acid. About one third of the osseous substance thus formed is gelatine, or glue, and more than one half is in the form of phosphates of lime and magnesia, which, for its soluble phosphoric acid, is sold as a fertilizer. There is also made with particular care a form of gelatine used by brewers to clarify beer.

The hair collected in these operations is not of uniform value. That which comes from the interior of the ears is very fine and is plucked out before all else, and after being properly treated is used for making "camel's"-hair pencils, which are sold at a low price and used for a multitude of purposes. The feet, after being freed from the horny covering, serve for the manufacture of a kind of oil used for dressing leather, the horn substance being manufactured into combs, buttons, etc. The horns of the ox serve for a multitude of purposes. They can be made supple, be split into thin plates and pressed in heated molds into divers forms and receive various colors, thus imitating closely the highest priced tortoise-shell. They can also be made into umbrella-handles, knife-handles, tobacco-boxes, goblets, napkin-rings, etc. The comparative scarcity of whalebone has called attention to this product, which in a measure replaces it.

The different uses of bones are increasing. For knife-handles and kindred service they have long been utilized, and, as stated herein, are now made into bone charcoal, fertilizer, glue and gelatine, and different chemical substances.

The hair removed in the process of making glue is burned in a closed vessel, and serves in the manufacture of ammonia, which is used for making artificial ice in breweries, cold-storage warehouses, etc.

Even the undigested food found in the stomach of the ox is utilized, one purpose to which it is put being the manufacture of strawboard. When it is a mixture of hay and Indian corn it is compressed and dried, and then forms a food known by the name of "Texas Nut."

The bile, under the name of ox-gall, is used in painting, in cleaning and in bookbinding. The stomach of the young calf furnishes the rennet used to curdle milk for cheese, and pepsin is also obtained from the same source. The most convenient and abundant source of pepsin, however, is the stomach of the hog, from which the greater part of this medical product, now much used, is obtained.

The by-products of the hog, sheep, calf and other animals are as closely and economically utilized as those of the ox, and absolutely nothing is allowed to go to waste.

The importance of beef extract as an article of commerce may be realized when it is stated that one firm in Chicago manufactured three hundred thousand pounds of this article in 1895.

Among articles manufactured for medicinal use from the products of animals may be mentioned pancreatin, pepsin, peptone, thyroids, and, as mentioned herein, defibrinated blood and beef extract.

ABBATUCCI, Carlo, or Charles, a French general, son of G. P. Abbatucci; served with distinction in the campaigns of the French army of the Rhine, 1794–96. Born 1771; killed in battle Dec. 2, 1796.

ABBATUCCI, Charles a counselor of state un-

der Napoleon III. In June, 1872, he was elected to the National Assembly. Born 1816; died 1885.

ABBATUCCI, GIACOMO PIETRO, or JACQUES PIERRE, a Corsican partisan commander who became a general of division in the French service in Italy under Napoleon. Born 1726; died 1812.

ABBATUCCI, JACQUES PIERRE CHARLES, a French jurist and politician, grandson of G. P. Abbatucci. He was at one time (1852) appointed minister of justice by Louis Napoleon. Born 1792; died 1857.

ABBE, CLEVELAND, an American meteorologist and astronomer; born in New York City, Dec. 3, 1838. He was graduated at the New York Free Academy; taught mathematics in Trinity Latin School, and then studied astronomy under Brünow, Gould and Struvé. In 1868 he was elected director of the Cincinnati Observatory, and inaugurated a system of daily meteorological reports by telegraph, with weather predictions. Its success led Congress to direct the Secretary of War to provide for taking meteorological observations at military posts, with the design of giving warning of any approach of storms. In 1871 Abbe was appointed meteorologist of the new Weather Bureau at Washington, under A. J. Myer. As it was his duty to prepare "probabilities," Professor Abbe became popularly known as "Old Probabilities," and under his direction the service reached a high degree of efficiency. He has written for numerous periodicals, cyclopædias, and books of reference on astronomical and meteorological subjects.

ABBETT, LEON, governor of New Jersey, was born in Philadelphia, Oct. 8, 1836. He removed to New Jersey in early life, and for many years was a member of the New Jersey and New York bars. He early entered politics, and served three terms as a member of the New Jersey legislature, subsequently becoming state senator, and for three years was president of the senate. In 1883, and again in 1889, he was elected governor of New Jersey, and was twice an unsuccessful candidate for the United States Senate. In 1893 he was appointed a justice of the New Jersey supreme court by his successor, Governor George T. Werts. Died Dec. 4, 1894.

ABBEVILLE, capital of Henry County, in the southeast part of Alabama, is a precinct and village on a branch of the Yattayabba Creek, and is connected by a branch line with the Alabama Midland railroad. Population of the precinct in 1890, 1,826.

ABBEVILLE, capital of Vermilion Parish, Louisiana, is a district and town in the southern part of the state. It is connected by a branch line with New Iberia, on the Southern Pacific railroad, and is also on Vermilion Bayou. It has a few manufactures. Population in 1890, 2,737.

ABBEVILLE COURT HOUSE is the capital of Abbeville County, in the west-northwest part of South Carolina. It is at the junction of the Georgia, Carolina and Northern and the Southern railroads, 107 miles N.W. of Columbia, and has manufactures of cotton-seed oil and fertilizers. Population of the town in 1890, 1,696; of the township, 4,048.

ABBEVILLE TREATIES, so called because of the meeting of Henry III of England and Louis IX of France at Abbeville, May 20, 1259, to conduct negotiations for a treaty of peace, by which Henry relinquished his claims to Anjou, Poitou, Normandy, Touraine and Maine, and acknowledged his tenure of Guienne as a fief of France. The final terms of the treaty were settled in Paris.

ABBEY, EDWIN AUSTIN, American artist, born in Philadelphia, Pennsylvania, April 1, 1852. He studied at the Pennsylvania Academy of Fine Arts, and later devoted himself to drawing illustrations for books and magazines. In 1875 he took up water-color work, and in 1883 removed to London, where his studio now is. Among his notable pictures are *The Stage Office*, *The Evil Eye*, *Lady in a Garden*, *Rose in October*, and *The Widower*. Mr. Abbey is a member of the New York Water-Color Society, of the New York Etching Club, of the Tile Club, and of the London Institute of Water-Colors. In 1896 he was made an associate of the Royal Academy in London. His picture, *Richard Duke, of Gloucester, and the Lady Anne*, was the success of the year 1896 in the English Royal Academy Exhibition.

ABBEY, HENRY E., an American theatrical manager, was born in Akron, Ohio, in 1848. He commenced his managerial career in 1870, and acted as manager for Patti, Sara Bernhardt, Mrs. Langtry, Sir Henry Irving, and others. He died in New York City, Oct. 17, 1896.

ABBEY, RICHARD, an American Methodist clergyman and author; born in Genesee County, New York, Nov. 16, 1805. Removed to Natchez, Miss., 1825, and in 1844 joined the Mississippi conference of the Methodist Episcopal Church South. He is the author of several religious books, among which are *The End of the Apostolic Succession*, *Creeds for All Men*, *The Church and the Ministry*, and *The City of God and the Church-Makers*. He was also a frequent contributor to religious papers and reviews.

ABBEYVILLE, capital of Wilcox County, in south-central Georgia, is a town on the Ockmulgee River, at the point where the Georgia and Alabama railroad joins a branch railway to Waycross. It is 130 miles W. of Savannah. Population of township in 1890, 1,332.

ABBITIBBI, a lake, river and trading-station in the northeast of the province of Ontario, Canada, south of James Bay, into which the river empties.

ABBON, THE CROOKED (Lat. *Abbo Cernuus*), a Norman monk of St. Germain-des-Prés who wrote a Latin poem descriptive of the siege of Paris by the Normans (885–887). Died 923.

ABBOT, BENJAMIN, LL.D., an eminent American educator; born at Andover, Massachusetts, Sept. 17, 1762. Graduated at Harvard in 1788. For half a century he was principal of Phillips Academy at Exeter, New Hampshire, and numbered among his pupils Daniel Webster, Alexander H. Everett. Edward Everett, Lewis Cass, Jared Sparks, George Bancroft, and others. Died Oct. 25, 1849.

ABBOT, EZRA, born in Jackson, Maine, April 28, 1819; died at Cambridge, Massachusetts, March 21, 1884. He studied at Phillips Exeter Academy, and afterward at Bowdoin College, where he graduated at the age of 21. For many years he was engaged in

tuition and in the preparation of books on Scriptural and theological subjects. In 1856 he was appointed assistant librarian of Harvard College. That University gave him the degree of D.D. in 1872, and Yale made him LL.D. in 1869. Dr. Abbot in 1872 associated himself with the Divinity School at Cambridge, Massachusetts, as professor of New Testament criticism, and held this position until his death. As an exegetical and critical reviewer, his views being those of a Unitarian, he became widely known. He published *New Discussions of the Trinity*, *Literature of the Doctrine of a Future Life*, and various controversial works, but his most important production was *The Authorship of the Fourth Gospel*, published in 1880. He assisted in the revision of the New Testament, as a member of the American committee.

ABBOT, Francis Ellingwood, American philosopher; born in Boston, Massachusetts, Nov. 6, 1836. After graduating at Harvard College in 1859, he studied theology and became a Unitarian clergyman. In 1870 he left the ministry, however, and edited *The Index*, a Boston journal of free thought. He has written much on metaphysical subjects, and has published *Scientific Theism* and *The Way Out of Agnosticism*.

ABBOT, Henry Larcom, an American military engineer, born at Beverly, Massachusetts, Aug. 13, 1831, and educated at West Point. Before the Civil War he was engaged in the survey of the Pacific railroad and of the Mississippi Delta. He was wounded at the battle of Bull Run, 1861; served in the Virginia peninsular campaign; topographical engineer to Banks' expedition to New Orleans; commanded the siege artillery before Richmond, Va., 1864–65, and at the capture of Fort Fisher; attained the rank of brevet major-general of volunteers. After the war he devoted himself to scientific pursuits. He accompanied the eclipse expedition to Sicily in 1870; wrote on fortifications, river and harbor improvements, hydraulics, gun-foundries and siege artillery; invented a submarine mine system used in the coast defenses of the United States; wrote the article on the Mississippi River (see Vol. XVI, pp. 518–21) in this Encyclopædia.

ABBOT, Joel, an American naval commander, was born at Westford, Massachusetts, Jan. 18, 1793. He entered the navy as midshipman, and was signal-officer of the *President;* was promoted for gallantry in connection with the naval campaign against the British on Lake Champlain; commanded the captured pirate vessel *Mariana* in 1818, and was promoted commander in 1838. He succeeded Commodore Perry as flag-officer of the expedition to Japan. He rendered efficient service in the conduct of our diplomatic relations with China, where he died, Dec. 14, 1855.

ABBOT, Joel, M.D., was born at Fairfield, Connecticut, March 17, 1766, and removed to Georgia in 1794, where he engaged in the practice of medicine. He was a member of the Georgia legislature in 1809, and United States Congressman 1816–25. He died at Washington, Georgia, Nov. 19, 1826.

ABBOT, Joseph Hale, an American lexicographer and educator, was born at Wilton, New Hampshire, Sept. 26, 1802, and taught at Bowdoin College, at Phillips Exeter Academy, and in Boston and Beverly. He contributed to Worcester's Dictionary, and was prominent among the advocates of the claims of Dr. Jackson as the discoverer of the use of ether as an anæsthetic. Died at Cambridge, Massachusetts, April 7, 1873.

ABBOT, Samuel, an American merchant and philanthropist; born at Andover, Massachusetts, Feb. 25, 1732. He was one of the founders of the Andover Theological Seminary, to which he gave twenty thousand dollars during his lifetime, and one hundred thousand dollars at his death. Died April 12, 1812.

ABBOT OF MISRULE, a name given in Scotland during the middle ages to the master of revels. Also called the "Abbot of Unreason" and the "Abbot of Fools."

ABBOTT, Austin, an American lawyer and legal writer, born in Boston, Dec. 18, 1831, the son of Jacob Abbott. He was appointed dean of the faculty of law of the University of the City of New York in 1891, and is the author of several legal compilations. Died in New York, April 19, 1896.

ABBOTT, Benjamin, an American Methodist clergyman, born on Long Island, New York, in 1732. In his early youth he was apprenticed to a hatter in Philadelphia, where he led a riotous existence. At the age 33 he came under the influence of a Methodist preacher, and soon after himself began to preach. Suspected, as the Methodists were, of disloyalty, he on one occasion preached to one hundred soldiers who had assembled to injure him, and so effectively as to persuade them to disperse. He became an itinerant preacher and held services in New York, New Jersey, and Maryland. He died in Salem, New Jersey, Aug. 14, 1796.

ABBOTT, Benjamin Vaughan, an American lawyer and writer; born in Boston, June 4, 1830, the son of Jacob Abbott and the brother of Austin and Lyman Abbott. He was graduated at the University of the City of New York, and after several years of study began the practice of law in New York. He soon turned his attention to editing and compiling law reports and published several original treatises. In 1870 to 1873 he was a member of a commission of three appointed to revise the United States statutes. Among his works are *Digest of New York Statutes* (1863; new ed. 1876); *Digest of U. S. Court Reports and Acts of Congress* (1875); *Law Dictionary* (1879); *National Digest* (1884); and *Patent Laws of all Nations* (1886), besides working with Austin on law text-books. He died in Brooklyn, Feb. 17, 1890.

ABBOTT, Charles, Lord Tenterden, an eminent English jurist; born at Canterbury, Oct. 7, 1762, of humble parents. In 1802 he published a treatise on the law relative to *Merchant Ships and Seamen*. In 1816 he became one of the justices of the court of common pleas. In 1818 he was knighted and became chief justice of the king's bench. He was raised to the peerage in 1827, and became one of the most influential members of the House of Lords. Died Nov. 4, 1832.

ABBOTT, Charles Stuart Aubrey, third Lord

TENTERDEN, an English diplomatist; born in London, Dec. 26, 1834. After considerable service in the foreign office, he acted as secretary to the joint high commission at Washington in relation to the Alabama claims in 1871, and subsequently was the general agent of Great Britain in the conference on the claims. Lord Tenterden was appointed permanent under-secretary for foreign affairs in 1873, and in 1878 was one of the royal commissioners at the Paris Exhibition. He died Sept. 22, 1882.

ABBOTT, EDWIN ABBOTT, D.D., theologian and philologist, was born in London in 1838. After a brilliant career at St. John's, Cambridge, he obtained a fellowship, was master at King Edward's School, Birmingham, and at Clifton College, and was for 24 years head master of the City of London School, retiring in 1889 on a pension. He was select preacher at both universities, and his sermons gave him a place in the front rank of the more liberal theologians within the English Church. His view of Christianity he stated in *Through Nature to Christ* (1877). He was the author of *Philochristus* and *Onesimus*, two romances of the first age of the church, and of *The Kernel and the Husk* (1877), an amplification of the view of Christianity contained in the preceding. In 1884 he published, in conjunction with W. J. Rushbrooke, *The Common Tradition of the Synoptic Gospels*, and he wrote the article on the GOSPELS, in this ENCYCLOPÆDIA, Vol. X, pp. 789–843. His well-known *Shakespearean Grammar* (1869) has been followed by several works of great practical value on the teaching of English. Of more general interest are his *Bacon and Essex* (1877) and *Francis Bacon* (1885). Among his later works are *Philomythus* (1891), and *The Anglican Career of Cardinal Newman* (1892).

ABBOTT, EMMA, an American operatic singer, born in Chicago, Illinois, Dec. 9, 1849. At an early age she exhibited some musical talent, and while singing at a parlor entertainment in Toledo, Ohio, attracted the notice of Clara Louise Kellogg, who took her to New York to complete her musical training. In 1872 she was sent abroad by the congregation of the Rev. Dr. Chapin's church, studied in Paris and Milan, and was befriended by the Baroness Solomon de Rothschild. In Paris she was secretly married to Eugene Wetherell. Her first appearance was in *The Daughter of the Regiment*, produced in London; then a refusal to appear in *La Traviata* caused some sensation and met with the approval of her American friends. From her first appearance her operatic success was assured and unbroken. She survived her husband two years, and died in Salt Lake City, Jan. 5, 1891.

ABBOTT, GORHAM DUMMER, an American educator; born at Hallowell, Maine, Sept. 3, 1807. He graduated at Bowdoin College and studied theology at Andover; was ordained as a Congregational minister and became a teacher in New York city. He established and conducted two educational institutions for women, and was much occupied with biblical research. He is the author of *Nathan Dickerman; Mexico and the United States;* and other works. Died at South Natick, Massachusetts, July 31, 1874.

ABBOTT, JACOB, was born at Hallowell, Maine, Nov. 14, 1803; was professor of mathematics in Amherst College from 1825 till 1829, and was subsequently a Congregational pastor. In 1838 he began writing simple and popular works, mainly for the young, by which his name was widely known. His most popular work is *The Young Christian*, the "memorial edition" of which contains a life by his son. He published over 200 volumes, amongst which are *The Franconia Stories*, 10 vols.; *Histories for the Young*, 19 vols.; *Marco Paul's Adventures*, 6 vols.; *Harper's Story Books*, 36 vols.; *The Rollo Books*, 36 vols.; *Science for the Young*, 4 vols.; *American Histories for Youth*, 8 vols. He died at Farmington, Maine, Oct. 31, 1879.

ABBOTT, JOHN JOSEPH CALDWELL, Canadian statesman, born at St. Andrews, Argenteuil County, Canada East, March 12, 1821. He was educated at St. Andrews and McGill colleges, was admitted to the bar in 1847, and in 1859 he was elected as representative to the Canadian Assembly. He was knighted and served as premier of the Dominion, 1891–92. Died Oct. 30, 1893.

ABBOTT, JOHN STEPHENS CABOT, American historian, born at Brunswick, Maine, Sept. 18, 1805. In 1825 he was graduated at Bowdoin College, studied theology, and continued his pastoral labors until 1844, when he retired to devote himself to literature. His principal works are *Kings and Queens, or Life in the Palace; The French Revolution of 1789; The History of Napoleon Bonaparte; Napoleon at St. Helena; The History of Napoleon III; A History of the Civil War in America; Romance of Spanish History; The History of Frederick the Second, called Frederick the Great;* histories of *Austria, Russia, Spain* and *Italy; Lives of the Presidents;* and *Practical Christianity.* Many of his works have been translated into foreign languages. He died at Fair Haven, Connecticut, June 17, 1877.

ABBOTT, JOSIAH GARDNER, an American jurist and politician, born at Chelmsford, Massachusetts, Nov. 1, 1815; judge of the superior court for Suffolk County, 1855–59; member of Congress, 1875–77. Died at Wellesley Hills, Massachusetts, June 2, 1891.

ABBOTT, LYMAN, D.D., American clergyman; born at Roxbury, Massachusetts, Dec. 18, 1835, son of Jacob Abbott; graduated at the University of the City of New York; studied law; ordained pastor of Congregational church, Terre Haute, Ind.; editor of *Illustrated Christian Weekly*, 1871–76, and then of *The Christian Union* (now *The Outlook*); succeeded Mr. Beecher, of whom he wrote a *Life* (1883), as pastor of Plymouth Church, Brooklyn, 1888; wrote commentaries on the first six books of the New Testament; assisted on Conant's *Dictionary of Religious Knowledge;* and published *The Evolution of Christianity* (1892).



LYMAN ABBOTT, D.D.

ABBOTT, ROBERT OSBORNE, American surgeon; born in Pennsylvania in 1824. His entire life was given up to arduous labors in the military field and hospital. He died in Brooklyn, New York, June 16, 1867, a victim of overwork.

ABBREVIATIONS AND CONTRACTIONS are often made of words and phrases in common use. As a general rule a contraction is made by omitting certain letters, preferably vowels, and bringing together the first and last letters or elements. An abbreviation may be made either by omitting certain portions from the interior of the word or by cutting off a part. A contraction is an abbreviation, but an abbreviation is not necessarily a contraction. The principal abbreviations in general use will be found in the subjoined table.

## ABBREVIATIONS.

### A.

A. *or* a Answer; Acre; Alto; Accepted (*in commerce*); Are (*in the metric system*).
A.A.G. Assistant Adjutant-General.
A.A.S. Fellow of the American Academy.
A.A.S.S. Member of the American Antiquarian Society.
A.B. Bachelor of Arts; (see B.A.); Able-bodied seamen.
Abbr. *or* Abbrev. Abbreviated, Abbreviation.
Abl. *or* abl. Ablative.
Abp. Archbishop.
Abr. Abridged, Abridgment.
Abt. About.
A.C. Before Christ.
Acad. Academy.
Acad. Nat. Sci. Academy of Natural Science.
A.D. In the year of our Lord.
Ad. *or* Adv. Adverb; Advertisement.
A.D.C. Aide-de-Camp.
Adj. *or* adj. Adjective.
Adjt. Adjutant.
Ad lib. *or* ad libit. At pleasure.
Adm. Admiral, Admiralty.
Admr. Administrator.
Admx. Administratrix.
Adv. *or* adv. Advent; Advocate; Adverb.
Adv. *or* Ad. val. *Ad valorem.*
Advt. Advertisement.
Æ. *or* Æt. Of age.
Af. *or* A. fir. Firkin of Ale.
Af. *or* Afr. Africa, African.
A.G. Adjutant-General; Accountant-General; Attorney-General.
Ag. (Argentum) Silver.
Agl. Agricultural.
A.G.S.S. American Geographical and Statistical Society.
Agt. Agent.
A. H. In the year of the Hegira, or flight of Mahomet.
A.H.M.S. American Home Missionary Society.
Al. Aluminum.
Ala. Alabama.
Ald. Alderman.
Alex. Alexander.
Alg. Algebra.
Alt. Altitude.
A.M. (*Ante Meridiem*) Before noon.—(*Anno Mundi*) In the year of the world.—(*Ave Maria*) Hail Mary.—See M.A.
A.M.A. American Missionary Association.
Am. American.
Am. Assn. Sci. American Association for the Advancement of Science.
Amb. Ambassador.
A.M.D.G. To the greater glory of God.
Amer. America, American.
Amer. Phil. Soc. American Philosophical Society.
Amt. Amount.
An. (*Anno*) In the year.
Anal. Analysis, Analytic.
Anat. Anatomical, Anatomy.
Anc. Ancient, Anciently.
Angl Anglican.
Ang.-Sax. Anglo-Saxon.
Ann. Annales, Annals.
Anon. Anonymous
Ans. *or* ans. Answer.
Ant. *or* Antiq. Antiquities, Antiquarian.
Anthrop. Anthropology, Anthropological.
Aor. *or* aor. Aorist.
A.P. Associate Presbyterian.
Ap. Apostle.
Apl. *or* Apr. April.
A.P.A. American Protective Association.
Apo. Apogee.
Apoc Apocalypse, Apocrypha, Apocryphal.
App. Appendix.
Approx. Approximately.
Aq. (*Aqua*) Water.
Ar. Arrive, Arrival; Arabic.
A.R.A. Associate of the Royal Academy.
Arch. Architecture.
Archæol. Archæology.
Archd. Archdeacon.
Arith. Arithmetic, Arithmetical.
Ariz. Arizona.
Ark. Arkansas.
Arm. Armenian, Armoric.
Arr. Arrived, Arrivals.
Art. *or* art. Article.
As. Arsenic.
AS., A-S., A.S., *or* A.Sax. Anglo-Saxon.
A.S.A. American Statistical Association.
Assn. Association.
Asst. Assistant.
Astrol. Astrology, Astrological.
Astron. Astronomy, Astronomical.
Atty. Attorney.
Atty.-Gen. Attorney-General.
Au. (*Aurum*) Gold.
A.U.C. From the year of the building of Rome.
Aug. August.
Auxl. Auxiliary.
A.V. Authorized Version.
Av. *or* Ave. Avenue.
Avoir. Avoirdupois.

### B.

B. Bass (in music); Bay; Book, Baron; Boron; British.
b. Born.
B.A. Bachelor of Arts. (See A.B.)
Ba. Barium.
Bal. Balance.
Bap. *or* Bapt. Baptist.
Bar. Barleycorn; Barley; Barometer.
Bart. *or* Bt. Baronet.
Bat., Batt., *or* Bn. Battalion.
Bbl. Barrel. Bbls., Barrels.
B.C. Before Christ; Board of Control; British Columbia.
B.C.L. Bachelor of Civil Law.
B.D. Bachelor of Divinity.
Bd. Bond; Bound.
Bds. Bundles.
Bds. Boards (bookbinding); Bonds.
Be. (Beryllium) Glucinum.
Beds. Bedfordshire.
Benj. Benjamin.
Berks. Berkshire.
Bi. Bismuth.
Bib. Biblical.
Bibliog. Bibliography.
Biog. Biography, Biographical.
Biol. Biology, Biological.
Bk. Bank; Book; Bark (a vessel).
B.LL. See LL.B.
Bls. Bales.
B.M. Bachelor of Medicine.
B.M. *or* B. Mus. Bachelor of Music.
B.O. Buyer's Option.
Bor. Boron; Borough.
Bot. Botany, Botanical, Botanist; Bought.
Bp. Bishop.
Br. or br. Bromine; Brig.
Brig. Brigade, Brigadier.
Brit. Britain, British.
Bro. Brother. Bros., Brothers.
B.S. Bachelor of Surgery.
B.Sc. Bachelor of Science.
Bucks. Buckinghamshire.
Bu. Bushel.
B.V.M. Blessed Virgin Mary.

### C.

C. Caius; Carbon; Church; Congress; Consul; Centigrade; Catholic; Cent; Centime; A hundred; A gallon.
C. *or* Cap. Chapter.
C. *or* cub. Cubic.

Ca. Calcium; About.
Cal. California.
Cambs. Cambridgeshire.
Cant. Canterbury; Canticles.
Cantab. Of Cambridge.
Cantuar. Canterbury.
Cap. Capital; Chapter.
Caps. *or* caps. Capitals.
Capt. Captain.
Car. Carat.
Card. Cardinal.
Cash. Cashier.
Cat. Catalogue.
Cath. Catholic; Catherine; Cathedral.
C.B. Companion of the Bath; Cape Breton.
Cb. Columbium.
C.C. Caius College; Contra Credit; Account Current.
C.C.C. Corpus Christi College.
Cd. Cadmium.
C.D.V. *Carte-de-visite.*
C.E. Civil Engineer.
Ce. Cerium.
Cel. Celsius.
Cent., C. Centigrade; A hundred.
Cert., Certif. Certify; Certificate.
Cf. *or* cf. Compare.
C.G. Consul-General.
Cg. Centigram.
C.G.H. Cape of Good Hope.
C.H. Courthouse; Custom-house.
Ch. Church; Chapter.
Chanc. Chancellor.
Chap. Chapter.
Chas. Charles.
Chem. Chemistry, Chemical.
Chr. Christopher; Christian.
Chron. Chronicles, Chronology.
Cic. Cicero.
C.I.E. Companion of the Order of the Indian Empire.
Cir. About.
Circ. Circuit.
Civ. Civil.
C.J. Chief Justice.
Cl. Chlorine.
cl. Centiliter.
Cld. *or* cld. Cleared.
Clk. Clerk.
C.L.S.C. Chautauqua Literary and Scientific Circle.
C.M. Common Meter; Certificated Master; Corresponding Member; Master in Surgery; Lazarist Fathers.
Cm. Centimeter.
C.M.G. Companion of the Order of St. Michael and St. George.
Cml. Commercial.
Co. Cobalt; Company; County.
Coad. Coadjutor.
Coch. *or* Cochs. A spoonful.
C.O.D. Cash (or Collect) on Delivery.
Cod. Codex.
Col. Colonel; Colossians; Colonial; Column.
Coll. College.
Colloq. Colloquial.
Col. *or* Colo. Colorado.
Com. Commissioner; Commodore; Committee; Commerce; Common; Commander.
Com. *or* Comm. Commentary.
Comp. Compare, Comparative; Compound, Composition.
Compar. Comparative.
Comr. Commissioner.
Com. *and* Nav. Commerce *and* Navigation.
Com. Ver. Common Version.
Con. Against; In opposition.
Conch. Conchology.
Cong. Congress, Congregation, Congregational; A gallon.
Conj. *or* conj. Conjunction.
Conn. Connecticut.
Con. Sect. Conic Sections.
Contr. Contracted, Contraction.
Cor. Corinthians.
Corol. Corollary.
Cor. Sec. Corresponding Secretary.
Cos. *or* cos. Cosine.
Cosc. *or* cosec. Cosecant.
C.P. Common Pleas.
C.P.M. Common Particular Meter.
Cr. Chromium.
Cres. Crescendo.
Crim. Criminal.
Crim. con. Criminal conversation, *or* Adultery.
Crystal. *or* Crystallog. Crystallography.
Cs. Cæsium.
C.S.A. Confederate States of America; Confederate States Army.
C.S.I. Companion of the Star of India.
Csks. Casks.
C.S.N. Confederate States Navy.
Ct. Connecticut; Count; Court.
Ct. *or* ct. Cent; A hundred.
Ctl. *or* ctls. Cental *or* Centals.
Cts. *or* cts. Cents.
Cu. Copper.
Cub. *or* cub. Cubic.
Cur. *or* curt. Current (i.e., this month).
C.V. Common Version.
Cwt. *or* cwt. Hundredweight; Hundredweights.
Cyc. *or* cyclo. Cyclopædia.

## D.

D. Didymium; Dose.
D. *or* d. Day; Died; Daughter; A penny *or* pence.
Da. Davyum.
Dan. Daniel.
Dat. *or* dat. Dative.
D.C. District of Columbia. Again, *or* From the beginning.
D.C.L. Doctor of Civil (*or* Canon) Law.
D.D. Doctor of Divinity.
D.D.S. Doctor of Dental Surgery.
Dea. Deacon.
Dec. December.
Decag. Decagram.
Decal. Decaliter.
Decam. Decameter.
Def. *or* def. Definition.
Deft. *or* deft. Defendant.
Deg. *or* degs. Degree, Degrees.
Del. Delaware; Delegate.
Del. *or* del. He (*or* she) drew it.
Dem. Democrat, Democratic.
Dep. Deputy; Deponent.
Dept. Department; Deponent.
Deut. Deuteronomy.
Dft. *or* dft. Defendant.
D.G. By the grace of God; Thanks to God.
Dg. Decigram.
D.H. Deadhead.
Di. Didymium.
Dial. Dialectic.
Diam. *or* diam. Diameter.
Dict. Dictionary; Dictator.
Dim. *or* Dimin. Diminutive; Diminuendo.
Dio. Diocese.
Diosc. Dioscorides.
Dis. *or* dis. Discipline; Discharged; Disorderly; Distance; Distant.
Dis. *or* Disct. Discount.
Disp. Dispensatory.
Diss. Dissertation.
Dist. District.
Dist. Atty. District Attorney.
Div. Dividend.
Dl. Deciliter.
D. Lit. Doctor of Literature.
D.M. Doctor of Medicine, of Music.
Dm. Decimeter.
Do. *or* do. The same.
Doc. Document.
Dol. *or* dol. Dollar.
Dols. *or* dols. Dollars.
Dom. Econ. Domestic Economy.
Doz. *or* doz. Dozen.
Dpt. Deponent; Department.
Dr. Debtor; Doctor.
Dr. *or* dr. Dram; Drams.
D.Sc. Doctor of Science.
D.S.O. Distinguished Service Order.
D.S.P. He died without issue.
D.T. Doctor of Divinity.
D.V. God willing.
Dwt. *or* dwt. Pennyweight; Pennyweights.
Dyn. Dynamics.

## E.

E. East; Eastern (Postal District, London); Earl.
Ea. Each.
Eb. Erbium.
Eben. Ebenezer.
Ebor. York.
E.C. Eastern Central (Postal District, London), Established Church.
Eccl. *or* Eccles. Ecclesiastes; Ecclesiastical.
Eclec. Eclectic.
Econ. Economy.
Ed. Editor.
Ed. *or* ed. Edition.
Ed. *or* Edin. Edinburgh.
Edm. Edmund.
Eds. Editors.
Edw. Edward.
E.E. Errors excepted.
e.g. For example.
E.I. East Indies; East India.
Elec. Electricity, Electrical.
Eliz. Elizabeth.
E.Lon. East Longitude.
Em. Emma; Emily; Emanuel.
Emp. Emperor; Empress.
Ency. *or* Encyc. Encyclopædia.
E.N.E. East-northeast.
Eng. England, English; Engraving.
Engin. Engineering.

Ent. *or* Entom. Entomology.
Env. Ext. Envoy Extraordinary.
e.o.d. Every other day. (Printer's advertising mark.)
e.o.w. Every other week. (Printer's advertising mark.)
Ep. Epistle.
Eph. Ephesians; Ephraim.
Epiph. Epiphany.
Epis. Episcopal.
Eq. *or* eq. Equal; Equivalent.
Equiv. *or* equiv. Equivalent.
Er. Erbium.
Esd. Esdras.
E.S.E. East-southeast.
Esp., esp. *or* espec. Especially.
Esq. *or* Esqr. Esquire.
Esth. Esther.
E.T. English Translations.
*et al.* And elsewhere; And others. (Sometimes improperly written *et als.*)
Etc., etc., *or* &c. And others; And so forth.
Ethnol. Ethnology; Ethnological.
*et seq.*, *sq.*, or *sqq.* And the following.
Etym. *or* Etymol. Etymology.
Ex. Example; Exception; Exodus.
Exc. Excellency; Exception.
Exch. Exchequer; Exchange.
Ex. Doc. Executive Document.
Exec. Executor.
Execx. Executrix.
*Ex. Gr.* For example.
Exod. Exodus.
Exon. Exeter.
Ez. *or* Ezr. Ezra.
Ezek. Ezekiel.
E.& O.E. Errors and Omissions Excepted.

## F.

F. Folio; Friday; Fluorine; Fahrenheit.
F. *or* f Feminine; Franc; Florin; Farthing; Foot.—(*Fiat*) Let it be made.
Fahr. Fahrenheit.
F.A.S Fellow of the Society of Arts; Fellow of the Antiquarian Society.
Fcp. *or* fcp. Foolscap.
Fe. Iron.
Feb. February.
Fec. *or* fec. He (or she) did it.
Fem. *or* fem. Feminine.
Ferd. Ferdinand.
Feud. Feudal.
F.F.[L.] Felicissimus; Fratres.
F.F.V. First Families of Virginia.
Fid. Def. Defender of the Faith.
*Fi. Fa.* or *fi. fa.* You shall cause to be made.
Fig. *or* fig. Figure, Figures; Figurative, Figuratively.
Fir. *or* fir. Firkin.
Fl. or fl. Florin, Florins.
Fla. Florida.
F.L.S. Fellow of the Linnæan Society.
F.M. Field-Marshal.
F.O. Field-Officer; Foreign Office.
Fo., fo., Fol. *or* fol. Folio.
F.O.B. Free on board.
For. Foreign.
Fort. Fortification.
Fr. France; Francis; French.
Fr. From.
F.R.A.S. Fellow of the Royal Astronomical Society; Fellow of the Royal Asiatic Society.
F.R.C.P. Fellow of the Royal College of Physicians.
F.R.C.S. Fellow of the Royal College of Surgeons.
Fred. Frederic, Frederick.
F.R.G.S. Fellow of the Royal Geographical Society.
F.R.H.S. Fellow of the Royal Historical Society; Fellow of the Royal Horticultural Society.
Fri. Friday.
F.R.S. Fellow of the Royal Society.
F.S.A. Fellow of the Society of Arts, or of Antiquaries.
Ft. *or* ft. Foot, Feet; Fort.
Fth. *or* fth. Fathom.
Fur. *or* fur. Furlong.
Fut. *or* fut. Future.
F.Z.S. Fellow of the Zoölogical Society.

## G.

G. Genitive; Glucinum.
G. *or* g. Guinea, Guineas; Gulf.
g. Gram.
Ga. Georgia; Gallium.
G.A. General Assembly.
Gal. Galatians; Galen.
Gal. *or* gal. Gallon.
Galv. Galvanism.
G.A.R. Grand Army of the Republic.
G.B.&I. Great Britain and Ireland.
G.C.B. Grand Cross of the Bath.
G.C.M. Greatest Common Measure.
G.C.M.G. Grand Cross of St. Michael and St. George.
G.C.S.I. Grand Commander of the Star of India.
Gd. Gadolinium.
Ge. Germanium.
Gen. Genesis; General; Geneva *or* Genevan.
Gen. *or* gen. Genitive, Generally, Genus, Genera, Generic.
Geo. George.
Geog. Geography, Geographer, Geographical.
Geol. Geology, Geological, Geologist.
Geom. Geometry, Geometer, Geometrical.
Ger. *or* ger. Gerund.
Gl. Glucinum.
Gloss. Glossary.
G.O. General Order.
G.O.P. Grand Old Party.
Gov. Governor.
Govt. Government.
G.P. *Gloria Patri*.
G.P.O. General Post-Office.
G.R. George the King.
Gr. *or* gr. Grain, Grains; Gross; Great.
Gram. Grammar.
Gris. Grisons.
Gro. *or* gro. Gross.
Gtt. *or* gtt. Drop, Drops.

## H.

H. Hydrogen.
H. *or* h. High, Height; Harbor; Husband; Hour, Hours.
Ha. Hectare.
Hab. Habakkuk.
H.A.C. Honorable Artillery Company.
Hag. Haggai.
Hants. Hampshire.
H.B.C. Hudson's Bay Company.
H.B.M. His (*or* Her) Britannic Majesty.
H.C. House of Commons.
H.C.M. His (*or* Her) Catholic Majesty.
Hdkf. *or* hdkf. Handkerchief.
H.E. His Eminence, or Excellency.
Heb. *or* Hebs. Hebrew, Hebrews.
H.E.I.C.S. Honorable East India Company's Service.
Herp. Herpetology.
Hf. bd. *or* hf. bd. Half-bound.
Hg. Mercury.
hg. Hectogram.
H.H. His (*or* Her) Highness; His Holiness (the Pope.)
Hhd. *or* hhd. Hogshead, Hogsheads.
H.I.H. His(*or* Her) Imperial Highness.
Hil. Hilary.
Hist. History, Historical.
H.J.S. Here lies buried.
H.L. House of Lords.
Hl. Hectoliter.
H.M. His (*or* Her) Majesty; Hallelujah Meter; Home Mission.
Hm. Hectometer.
H.M.P. Erected this monument.
H.M.S. His (*or* Her) Majesty's Steamer, Ship *or* Service.
Ho. House.
Hon. *or* Honble. Honorable.
Hor. *or* Horol. Horology.
Hort. Horticulture, Horticultural.
Hos. Hosea.
H.P. Horse-power; Half-pay.
H.P.M. Hallelujah Particular Meter.
H.R. House of Representatives.
Hr. *or* hr. Hour.
H.R.E. Holy Roman Empire.
H.R.H. His (*or* Her) Royal Highness.
H.S.H. His (*or* Her) Serene Highness.
Hund. *or* hund. Hundred, hundreds.
Hunts. Huntingdonshire.
Hyd. Hydrostatics.
Hydraul. Hydraulics.
Hydros. Hydrostatics.
H.Y.M.A. Hebrew Young Men's Association.
Hypoth. Hypothesis, Hypothetical.

## I.

I. Iodine; Island.
Ia. Iowa.
Ib., ib., Ibid. *or* ibid. In the same place.
Ich. *or* Ichth. Ichthyology.
Icon. Iconographic.
Id. Island.
Id. *or* id. The same.
Ida. Idaho.
I.e. *or* i.e. (*Id est*) That is.
I.H.S. Jesus the Saviour of Men.
Ill. Illinois.
Illus. Illustration.
Imp. Imperial; Impersonal; Imported.
Imp., imp., Imperf. *or* imperf. Imperfect.

In. Indium.
In. *or* in. Inch, Inches.
Incog. Unknown.
Ind. India, Indian, Indiana.
Ind., ind., Indic. *or* indic. Indicative.
Ind. T. *or* Ind. Ter. Indian Territory.
Inf. *or* inf. Infinitive.
In lim. *or* in lim. At the outset.
In loc. *or* in loc. In its place.
I.N.R.I. Jesus of Nazareth, King of the Jews.
Ins. *or* Insur. Insurance.
Insep. *or* insep. Inseparable.
Insp.-Gen. Inspector-General.
Inst. Instant (the present month); Institute, Institution.
Int. *or* int. Interest.
Int. Dept. Department of the Interior.
Intens. Intensive.
Interj. *or* interj. Interjection.
Internat. International.
Intrans. *or* intrans. Intransitive.
Int. Rev. Internal Revenue.
Introd. Introduction.
Inv. Invoice.
I.O.G.T. Independent Order of Good Templars.
I.O.O.F. Independent Order of Odd Fellows.
I.O.U. I owe you (an acknowledgment for money).
Ir. Ireland, Irish; Iridium.
Irreg., irreg. Irregular.
Is. *or* Isa. Isaiah.
Is., Isl. *or* isl. Island.
I.T. Indian Territory.
Itin. Itinerary.

## J.

J. Judge, Justice; Julius.
Jac. Jacob.
Jan. January.
Jas. James.
J.C. Jesus Christ.
Jer. Jeremiah.
J.H.S. See I.H.S.
Jno. John.
Jona. Jonathan.
Jos. Joseph.
Josh. Joshua.
Jour. Journal.
J.P. Justice of the Peace.
Jr. *or* jr. Junior.
Jud. Judith; Judicial.
Judg. Judges.
Jul. July.
Jul. Per. Julian Period.
Jun. June.
Jun., jun., Junr., junr. or jr. Junior.
Just. Justinian.

## K.

K. King, Kings; Knight; Potassium.
Kal. Kalends.
Kan. *or* Kans. Kansas.
K.B. Knight of the Bath (in Great Britain) King's Bench.
K.C.B. Knight Commander of the Bath (in Great Britain).
K.C.M.G. Knight Commander of St. Michael and St. George.
Ken. *or* Ky. Kentucky.
K.G. Knight of the Garter (in Great Britain).
Kg. Kilogram. Kgs., Kegs.
Kil. *or* kil. Kilderkin.
Kilo. Kilogram; Kilometer.
K.K.K. Kuklux Klan (*or* Clan).
Kl. Kiloliter.
Km. Kilometer.
K.N. Know-Nothing.
K.P. Knight of St. Patrick; Knight of Pythias.
Kt. Knight.
K.T. Knight of the Thistle; Knights Templar.
Ky. Kentucky.

## L.

L. Lady; Lord; Lithium—(After titles)—Book.
L. *or* l. Lake; Latitude; League, Leagues; Line, Lines; Link, Links.
L., Lb., lb., *or* ℔. A pound in weight.
L., l., *or* £. A pound sterling.
L. Liter.
La. Louisiana; Lanthanum.
Lab. Labor.
L.A.C. Licentiate of the Apothecaries' Company.
Lam. Lamentations.
Lat. Latin.
Lat. *or* lat. Latitude.
l.c. Lower case; in the place before cited.
L.C.J. Lord Chief Justice.
L.C.M. Least Common Multiple.
Ld. Lord.
Ldp. *or* Lp. Lordship.
L.D.S. Licentiate of Dental Surgery.
Lea. *or* lea. League.
Leg. Smoothly.
Leg. *or* Legis. Legislature, Legislative.
Lin. Lineal (Right-line measure).
Lev. Leviticus.
Lex. Lexicon.
Lexicog. Lexicography.
L.I. Long Island; Light Infantry.
Li. *or* L. Lithium.
Lib. Librarian, Library.
Lib. *or* lib. Book.
Lieut. *or* Lt. Lieutenant.
Linn. Linnæus; Linnæan.
Liq. Liquor.
Lit. Literature, Literary.
Lit. *or* lit. Literally.
Lit. D. *or* Litt. D. Doctor of Literature.
Lith. *or* lith. Lithograph.
Liv. *or* liv. Livre.
L.L. *or* L.Lat. Low Latin; Law Latin; Land League; Lord-Lieutenant.
LL.B. Bachelor of Laws. See B.LL.
LL.D. Doctor of Laws.
LL.M. Master of Laws.
L.M. Long Meter.
Lon., Lond. London.
Lon., lon., Long. *or* long. Longitude.
Loq. Speaks.
L.P.M. Long Particular Meter.
L.R.C.P. Licentiate of the Royal College of Physicians.
L.S. Left Side; Place of the Seal.
L.S.A. Licentiate of the Apothecaries' Society.
L.S.D., £.s.d. *or* l.s.d. Pounds, shillings, pence.
Lt. Inf. Light Infantry.
Luth. Lutheran.
Lv. *or* lv. Livres.
Lxx. The Septuagint.

## M.

M. Monday; Monsieur; Meter; Thousand; Meridian *or* Noon.
m. Married.
M. *or* m. Masculine; Moon; Month, Months; Minute, Minutes; Mill, Mills; Mile, Miles; Member; Medicine; A handful; Mix; Mixture; Measure; By measure.
M.A. Master of Arts.
Mac. *or* Macc. Maccabees.
Mach. Machinery.
Mad. *or* Madm. Madam.
Mag. Magazine.
Maj. Major.
Mal. Malachi.
Man. Manége; Manual.
Manuf. Manufacture.
Mar. March; Maritime.
March. Marchioness.
Marg. Trans. Marginal Translation.
Marq. Marquis.
Mas., mas., Masc., masc. Masculine.
Mass. Massachusetts.
Math. Mathematics.
Matt. Matthew.
M.B. See B.M.
M.C. Member of Congress; Master of Ceremonies.
Mch. March.
M.D. Doctor of Medicine.
Md. Maryland.
Mdlle. Mademoiselle.
M.E. Methodist Episcopal.
Me. Maine.
Meas. Measure.
Mech. Mechanics, Mechanical.
Med. Medicine, Medical.
Mem. Memorandum, Memoranda.
Mess. & Doc. Message and Document.
Messrs. *or* MM. Gentlemen, Sirs.
Met. Metaphysics, Metaphysical.
Metal. Metallurgy.
Metaph. Metaphysics.
Meteor. Meteorology, Meteorological.
Meth. Methodist.
Meton. Metonymy.
Mex. Mexico.
Mfd. Manufactured.
Mfg. Manufacturing.
M.F.H. Master of Foxhounds.
M. ft. Let a mixture be made.
Mg. Magnesium.
Mg. *or* mgr. Milligram.
Mgr. Monsignor; Magistrate.
Mi. *or* mi. Mill, Mills.
Mic. Micah.
Mich. Michigan; Michaelmas.
Mid. *or* mid. Middle (voice).
Mil. Military.
Min. Mineralogy, Mineralogical.
Min. *or* min. Minute; Mining.
Minn. Minnesota.
Min. Plen. Minister Plenipotentiary.
Misc. Miscellaneous.
Misce. Mix.
Miss. Mississippi.
Ml. Milliliter.
Mlle. Mademoiselle.
Mm. Millimeter.
M.M. [L.] Magistri; Martyres; Matrimonium; Meritissimus.

Mme. Madame.
Mn. Manganese.
Mnfg. Manufacturing.
M.O. Money-Order.
Mo. Missouri; Molybdenum.
Mo. *or* mo. Month.
Mod. Modern; Moderately.
Mon. *or* Mond. Monday.
Mons. Monsieur *or* Sir.
Monsig. Monsignore.
Mont. Montana.
Mos. *or* mos. Months.
M.P. Member of Parliament; Metropolitan Police; Municipal Police; Methodist Protestant.
M.P.P. Member of the Provincial Parliament.
Mr. Master *or* Mister.
M.R. Master of the Rolls.
M.R.C.C. Member of the Royal College of Chemistry.
M.R.C.P. Member of the Royal College of Physicians.
M.R.C.S. Member of the Royal College of Surgeons.
M.R.C.V.S. Member of the Royal College of Veterinary Surgeons.
M.R.I. Member of the Royal Institution.
Mrs. Mistress.
MS. Manuscript.
MSS. Manuscripts.
Mt. Mount *or* Mountain.
Mts. Mountains.
Mus. Music, Musical; Museum.
Mus. B. Bachelor of Music.
Mus. D. Musical Director.
Mus. D., Mus. Doc. *or* Mus. Doct. Doctor of Music.
M.W.S. Member of the Wernerian Society.
Myg. Myriagram.
Myl. Myrialiter.
Mym. Myriameter.
Myst. Mysteries.
Myth. Mythology, Mythological.

## N.

N. Noon; North, Northern (Postal District, London); Note; Name; New; Number; Nitrogen; Norse.
N. *or* n. Noun; Neuter; Nail, Nails.
N.A. North America, North American.
Na. Sodium.
N.A.D. National Academy of Design.
Nah. Nahum.
Nap. Napoleon.
Nat. Natural; Natal; National.
Nath. Nathaniel, *or* Nathanael.
Naut. Nautical.
Nav. Naval.
Navig. Navigation.
N.B. North Britain, North British; New Brunswick; Note well, *or* Take note.
Nb. Niobium.
N.C. North Carolina.
N.D. *or* n.d. No date.
Nd. Neodymium.
N.Dak. North Dakota.
N.E. Northeast, Northeastern (Postal District, London); New England.
Neb. Nebraska.
Neh. Nehemiah.
Nem. Con. *or* nem. con. No one contradicting; Unanimously.
Nem. Diss. No one dissenting; Unanimously.
Neth. Netherlands.
Neut. *or* neut. Neuter.
Nev. Nevada.
New Test. New Testament.
N.F. New French; Newfoundland.
N.G. No good.
N.H. New Hampshire.
Ni. Nickel.
N.J. New Jersey.
N.l. *or* n.l. It appears not; The case is not clear.
N.L. *or* N.Lat. North Latitude.
N.M. New Mexico.
N.N.E. North-northeast.
N.N.W. North-northwest.
No. Norium.
No. Number.
N.O. New Orleans.
Nol. Pros. Will not Prosecute *or* Prosecution Abandoned.
Nom. *or* nom. Nominative.
Non-com. Non-commissioned.
Non obst. *or* non obst. Notwithstanding.
Non seq. *or* non seq. It does not follow.
N.O.P. Not otherwise provided for.
Norm.Fr. Norman French.
Nos. Numbers.
Notts. Nottinghamshire.
Nov. November.
N.P. New Providence; Notary Public.
N.P.D. North Polar distance.
N.S. Nova Scotia; New School; New Style (since 1752).
N.T. New Testament.
Num. *or* Numb. Numbers.
Numis. Numismatics.
N.V. New Version.
Nux vom. Nux vomica.
N.W. Northwest; Northwestern (Postal District, London).
N.W.T. Northwest Territory.
N.Y. New York.
N.Z. *or* N.Zeal. New Zealand.

## O.

O. Ohio; Oxygen; Old; A pint.
Ob. *or* ob. Died.
Ob. *or* Obad. Obadiah.
Obj. *or* obj. Objective, Objection.
Obs. Observatory.
Obs. *or* obs. Obsolete; Observation.
Obsoles. Obsolescent.
Obt. *or* Obdt. Obedient.
Oct. *or* 8vo. Octavo.
Oct. October.
O.F. Odd Fellows.
O.H.M.S. On His (*or* Her) Majesty's Service.
O.K. All correct ("Oll Korrect").
Ol. Oil.
Old Test. Old Testament.
Olym. Olympiad.
O.M. Old measurement.
Op. Opposite; Opus; Opera.
Opt. Optics.
Opt. *or* opt. Optative.
Or. *or* Oreg. Oregon.
Ord. Ordinance; Ordinary.
Orig. *or* orig. Original, Originally.
Ornith. Ornithology, Ornithological.
O.S. Old School; Old Style (previous to 1752).
Os. Osmium.
O.T. Old Testament.
Oxf. Oxford.
Oxf. Gloss. Oxford Glossary of Architecture.
Oxon. Of Oxford.
Oz. *or* oz. Ounce, Ounces.

## P.

P. *or* p. Page; Participle; Post; Pole; Phosphorus; Penny; By weight, a pugil; Father.
Pa. Pennsylvania.
P.a. Participial adjective.
Pal. *or* Paleon. Paleontology.
Par. Paragraph.
Parl. Parliament, Parliamentary.
Part. *or* part. Participle.
Pass. *or* pass. Passive.
Pathol. Pathology.
Pat. Of. Patent-Office.
Payt. *or* payt. Payment.
Pb. Lead.
P.C. Privy Council (*or* Councilor); Police Constable; Conscript Fathers.
P.Cyc. Penny Cyclopædia.
Pd. Paid; Palladium.
P.E. Protestant Episcopal.
Pe. Pelopium.
P.E.I. Prince Edward Island.
Penn. Pennsylvania.
Per. *or* Pers. Persia, Persian.
Per an. By the year.
Per cent *or* per cent, Per ct. *or* per ct. By the hundred.
Perf. *or* perf. Perfect.
Peri. Perigee.
Persp. Perspective.
Pet. Peter.
Pg. Portuguese.
Phar. *or* Pharm. Pharmacy, Pharmacopœia.
Ph.B. Bachelor of Philosophy.
Ph.D. Doctor of Philosophy.
Phil. Philip; Philippians; Philosophy, Philosopher; Philosophical; Philemon.
Phil. *or* Phila. Philadelphia.
Philem. Philemon.
Philol. Philology.
Philos. Philosophy, Philosophical.
Phil. Trans. Philosophical Transactions.
Phon. *or* Phonet. Phonetics.
Photog. Photography.
Photom. Photometry.
Phren. Phrenology, Phrenological.
Phy. Physical.
Phys. Physics, Physical; Physiology, Physiological.
Physiol. Physiology.
Pinx. *or* pinx. He (or She) painted it.
Pk. *or* pk. Peck.
Pkgs. Packages.
Pks. *or* pks. Pecks.
Pl. *or* pl. Place; Plate; Plural.
Plin. Pliny.
Pltf. Plaintiff.
Plup. *or* plup. Pluperfect.
Plur. *or* plur. Plural.
P.M. Postmaster; Afternoon.

P.M.G. *or* P.M.Gen. Postmaster-General.
P.O. Post-Office; Province of Ontario.
Pol. Econ. *or* Polit. Econ. Political Economy.
P.O.O. Post-Office Order.
Pop. *or* pop. Population; Popular, Popularly; Populist.
Pos., pos., Poss. *or* poss. Possessive.
pp. Pages.
p.p. Past participle.
P.P. Parish Priest.
P.P.C. To take leave.
Pph. *or* pph. Pamphlet.
p.pr. Present participle.
P.Q. Previous question; Province of Quebec.
Pr., Prs. Pair, Pairs.
Pr. Priest; Prince; Provençal; Praseodymium.
Pr. *or* pr. Preposition; Pronoun; Price; Present.
Pr., pr. *or* P. By the.
P.R. Prize Ring; Porto Rico.
P.R.A. President of the Royal Academy.
Preb. Prebend.
Pref. *or* pref. Prefix; Preface; Preferred.
Prep. *or* prep. Preposition.
Pres. President; Presbyterian.
Pres. *or* pres. Present.
Pret. *or* pret. Preterit.
Prim. Primary.
Prin. Principles.
Prin. Principal, Principally.
Print. Printing.
Priv. *or* priv. Privative.
P.R.N. According to the occasion.
Prob. *or* prob. Problem; Probably.
Prof. Professor.
Proc. Proceedings.
Pron. *or* pron. Pronoun; Pronominal; Pronounced, Pronunciation.
Pron. a. *or* pron. a. Pronominal Adjective.
Prop. *or* prop. Proposition; Properly.
Pros. Prosody.
Prot. Protestant.
Pro tem. *or* pro tem. For the time being.
Prov. Proverbs; Proverbially; Provost; Province; Provincial.
Prox. *or* prox. Next; Of the next month.
Prus. Prussian; Prussia.
P.S. Postscript.
Ps. *or* Psa. Psalm, Psalms.
Psychol. Psychology.
Pt. Platinum.
Pt. *or* pt. Pint; Part; Payment; Point; Port.
P.t. *or* p.t. Post town.
P.T.O. Please turn over.
Pub. Public; Published, Publisher, Publishing.
Pub. Doc. Public Documents.
Pulv. Powder.
Pun. *or* pun. Puncheon.
P.v. *or* p.v. Post village.
Pwt. *or* pwt. Pennyweight.
Pyro-elect. Pyro-electricity.

## Q.

Q. Question; Quintos.
Q. *or* q. A farthing.
Q. *or* qu. Query; Question; Queen; Quintus; Quintius.
Q.B. Queen's Bench.
Q.C. Queen's Counsel.
Q.d. *or* q.d. As if he should say.
Q.e. *or* q.e. Which is.
Q.E.D. Which was to be demonstrated.
Q.E.F. Which was to be done.
Q.l. *or* q.l. As much as you please.
Ql. Quintal.
Q.M. Quartermaster.
Q.M.G. Quartermaster-General.
Qr. *or* qr. Quarter(28 pounds); Quire; A farthing.
Qrs. *or* qrs. Quarters; Quires; Farthings.
Q.S. Quarter-section; A sufficient quantity.
Qt. *or* qt. Quart; Quantity.
Qts. *or* qts. Quarts.
Qu. Queen; Question.
Qu. *or* Qy. Query.
Q.v. *or* q.v. Which see; As much as you will.

## R.

R. Railway; Rare; Rhodium; Réaumur; King; Queen; Take.
R. Réaumur Thermometric scale.
R. *or* r. Rood, Roods; Rod, Rods; Rises; River; Right.
R.A. Royal Academy (*or* Academician); Royal Artillery; Rear-Admiral; Right-Ascension.
Rad. *or* rad. Root; Radical.
Rb. Rubidium.
R.C. Roman Catholic.
R.E. Royal Engineers; Reformed Episcopal.
Rec. *or* R. Recipe.
Recd. Received.
Recpt. Receipt.
Rec. Sec. Recording Secretary.
Rect. Rector; Receipt.
Ref. Reformed, Reformer, Reformation; Reference.
Ref. Ch. Reformed Church.
Reg. *or* Regr. Register, Registrar; Regular.
Reg. Prof. Regius Professor.
Reg. *or* Regt. Regent.
Regt. Regiment.
Rem. Remark, Remarks.
Rep. Representative; Republic; Report; Republican.
Repts. Reports.
Res. Resolution.
Retd. Returned.
Rev. Revelation; Revolution; Review; Revenue; Revise.
Rev. *or* Revd. Reverend.
Revs. (Plural of) Reverend.
Rev. Ver. Revised Version.
Rev. Stats. Revised Statutes.
Rh. Rhodium.
R.H.A. Royal Horse Artillery.
Rhet. Rhetoric, Rhetorical.
R.I. Rhode Island.
Rich. *or* Richd. Richard.
R.I.P. May He (*or* She) rest in peace.
Riv. *or* riv. River.
R.M. Royal Marines; Royal Mail; Resident Magistrate.
R.M.A. Royal Military (*or* Marine) Asylum; Royal Marine Artillery.
R.M.L.I. Royal Marine Light Infantry.
R.M.S. Royal Mail Steamer.
R.N. Royal Navy.
R.N.R. Royal Naval Reserve.
Ro. Right-hand page.
Ro. *or* ro. Rood.
Robt. Robert.
Rom. Roman, Romans.
Rom. Cath. Roman Catholic.
Rpt. Report.
R.R. Railroad.
Rs. Rupees.
R.S.V.P. Answer if you please.
Rt. Hon. Right Honorable.
Rt. Rev. Right Reverend.
Rt. Wpful. Right Worshipful.
Ru. Ruthenium; Runic; Russia, Russian.
Ry. Railway.

## S.

S. Sign; South; Southern (Postal District, London); Sulphur; Saint; Sunday; Saturday; Signor; Saxon; Scribe; Sextus.
S. *or* Sab. Sabbath.
S. *or* s. Second; Shilling; Sun; Sets; See; Solo; Stem; Section; Series; Singular; Son; Succeeded.
S.A. South America; South Africa; South Australia.
S.A. *or* s.a. According to Art.
Sam. Samuel; Samaritan.
Saml. Samuel.
Sans., Sansk. *or* Sanc. Sanskrit.
Sat. Saturday.
Sb. Antimony.
S.C. South Carolina.
Sc. *or* sc. To wit; Namely being understood.
Sc. Scandium; Scotch.
Sc. *or* Sculp. He (*or* She) engraved it.
Scan. Mag. Defamatory expressions injurious to persons of dignity.
Sch. A note; School.
Sch., sch. *or* schr. Schooner.
Sci. Science.
Sci. fa. *Scire facias.*
Scil. *or* scil. To wit; Namely being understood.
S.C.M. Imperial Majesty.
Scot. Scotland, Scotch, Scottish.
Scr. *or* scr. Scruple, Scrip, Scripture, Scriptural.
Sculp. or sculp. He (*or* She) engraved it.
Sculp. *or* sculpt. Sculpture.
S. Dak. South Dakota.
S.E. Southeast; Southeastern (Postal District, London).
Se. Selenium.
Sec. *or* Sec'y. Secretary.
Sec. *or* sec. Second; Section.
Sec. Secant.
Sec. Leg. Secretary of Legation.
Sect. *or* sect. Section.
Sen. Senate, Senator; Senior.
Sep. *or* Sept. September; Septuagint.
Seq. *or* seq. The following.
Sen. Doc. Senate Document.
Ser. Series.
Serg. *or* serj. Sergeant *or* Serjeant.

Serv. *or* Servt. Servant.
Sess. Session.
Sh., sh., S. *or* s. Shilling.
Shak. Shakespeare.
Si. Silicium, Silicon.
Sing. *or* sing. Singular.
S.J. Society of Jesus.
Skr. Sanskrit.
S. Lat. *or* S.L. South Latitude.
Sld. *or* sld. Sailed.
S.M. Short Meter.
Sm. Samarium.
Sm. Caps. Small Capitals.
S.N. *or* sn. According to Nature.
Sn. Tin.
S.O. *or* s.o. Seller's Option.
Soc. Society; Socialist.
S. of Sol. Song of Solomon.
Sol. Solomon; Solution.
Sol.-Gen. Solicitor-General.
Sp. Spain, Spanish; Spirit.
S.P. Without issue.
S.P.C.A. Society for the Prevention of Cruelty to Animals.
S.P.C.C. Society for the Prevention of Cruelty to Children.
S.P.C.K. Society for the Promotion of Christian Knowledge.
Spec. *or* specif. Specifically.
S.P.G. Society for the Propagation of the Gospel.
Sp. gr. Specific gravity.
S.P.M. Short Particular Meter.
S.P.Q.R. The Senate and People of Rome.
s.p.s. Without surviving issue.
Sq. *or* sqq. And the following.
Sq. *or* sq. Square.
Sr. Sir, *or* Senior; Strontium.
SS. *or* ss. Namely Saints.
S.S.E. South-southeast.
S.S.W. South-southwest.
St. Saint; Street; Stone; Strait. Let it stand.
Stat. Statute; Statutes; Statuary.
S.T.D. Doctor of Divinity; Doctor of Sacred Theology.
Ster. *or* Stg. Sterling.
Str. Steamer.
Subj. *or* subj. Subjunctive.
Subst. *or* subst. Substantive; Substitute.
Suff. *or* suff. Suffix.
Sun. *or* Sund. Sunday.
Sup. Supreme; Superior; Supplement; Superfine; Superlative.
Supp. Supplement.
Supt. Superintendent.
Surg. Surgeon; Surgery.
Surv. Surveying; Surveyor.
S.v. *or* s.v. Under the word (*or* title).
S.W. Southwest; Southwestern (Postal District, London).
Syn. *or* syn. Synonym; Synonymous.
Synop. Synopsis.

## T.

T. Tenor; Titus; Tullius; Tuesday; All together.
T. *or* t. Town; Township; Territory; Ton; Tun; Testament.
Ta. Tantalum.
Tab. Table; tabular statement.
Tal. qual. *or* tal. qual. Just as they come; average quality.
Tan. *or* tan. Tangent.
Tart. Tartaric.
Tb. Terbium.
Te. Tellurium.
Tel. *or* Teleg. Telegraphy.
Tenn. Tennessee.
Ter. Territory.
Term. *or* term. Termination.
Test. Testament.
Tex. Texas.
Text. Rec. Received Text.
Tf. *or* tf. Till forbidden (Printer's advertising mark).
Th. Thursday; Thomas; Thorium.
Theo. Theodore; Theodosia.
Theol. Theology; Theological.
Theoph. Theophilus.
Theor. *or* theor. Theorem.
Thess. Thessalonians.
Tho. *or* Thos. Thomas.
Thurs. Thursday.
Ti. Titanium.
Tier. or tier. Tierce.
Tim. Timothy.
Tit. Titus; Title.
Tl. Thallium.
Tob. Tobit; Tobacco.
Tom. Tome *or* volume.
Tonn. *or* tonn. Tonnage.
Topog. Topography, Topographical.
Tp. Township.
Tr. *or* tr. Translation, Translator; Transpose; Treasurer; Trustee; Terbium.
Trans. Transactions; Translated, Translation, Translator.
Trav. Travels.
Treas. Treasurer.
Trig. Trigonometry; Trigonometrical.
Trin. Trinity.
Tu. Thulium.
Tu. *or* Tues. Tuesday.
Typ. *or* Typo. Typographer.
Typog. Typography; Typographical.

## U.

U. Uranium.
U.B. United Brethren.
U.K. United Kingdom.
Ult. *or* ult. Last; of the last month.
Unit. Unitarian.
Univ. University; Universalist.
Univ. *or* univ. Universally.
Unm. Unmarried.
u.s. As above.
U.S. United States.
U.S.A. United States of America; United States Army.
U.S.L. United States Legation.
U.S.M. United States Mail; United States Marine.
U.S.M.A. United States Military Academy.
U.S.N. United States Navy.
U.S.S. United States Senate; United States Ship (*or* Steamer).
U.S.S.Ct. United States Supreme Court.
U.S.V. United States Volunteers.
u.s.w. And so forth.
U. Utah.
Ux. Wife.

## V.

V. Vanadium; Viscount.
V. *or* v. Verb; Verse; Village; Vocative; Volume.
V. *or* v. Against; See; Verb.
v.a. Verb active.
Va. Virginia.
Val. Value.
Var. *or* var. Variety.
Var. lect. Different reading.
Vat. Vatican.
V. aux. Verb auxiliary.
Vb. n. Verbal noun.
V.C. Vice-Chancellor; Victoria Cross.
v. def. Verb defective.
v. dep. Verb deponent.
V.D.M. Minister of the Word of God.
Ven. Venerable.
Ver. *or* ver. Verse; Verses.
V.G. Vicar-General.
V.G. *or* v.g. For example.
V.i. Verb intransitive.
Vid. *or* vid. See.
Vil. Village.
v. imp. Verb impersonal.
v. irr. Verb irregular.
Vis. *or* Visc. Viscount.
Vitr. Vitruvius.
Viz. *or* viz. Namely; To wit.
v.n. Verb neuter.
Vo. Left-hand page.
Voc. *or* voc. Vocative.
Vol. *or* vol. Volume.
Vols. *or* vols. Volumes.
V.P. Vice-President.
V.R. Queen Victoria.
v.r. Verb reflexive.
V. Rev. Very Reverend.
Vs. *or* vs. Against.
V.S. Veterinary Surgeon.
Vt. Vermont.
v.t. Verb transitive.
Vul. Vulgate.
Vulg. *or* vulg. Vulgar; Vulgarly.
vv.ll. Various readings.

## W.

W. Western (Postal District, London); Wednesday; Welsh; William; Warden; Tungsten.
W. *or* w. Week.
Wash. Washington.
W.C. Western Continent; Western Central (Postal District, London).
W.C.T.U. Women's Christian Temperance Union.
Wed. Wednesday.
Westm. Westminster.
W.f. *or* w.f. Wrong font.
Whf. *or* whf. Wharf.
Wk. *or* wk. Week.
W. I. West India; West Indies.
Wis. Wisconsin.
W. Long. West Longitude.
Wm. William.
W.N.W. West-northwest.
W.S. Writer to the Signet.
W.S.W. West-southwest.
Wt. *or* wt. Weight.
W. Va. West Virginia.
Wyo. Wyoming.

## X.

Xd. Examined; without dividend.
X. *or* Xt. Christ.
Xm. *or* Xmas. Christmas.
Xn. *or* Xtian. Christian.

Xnty. *or* Xty. Christianity.
Xper. *or* Xr. Christopher.

Y.

Y. Yttrium.
Y. *or* yr. Year.
Y.B. *or* Yr.B. Year Book.
Yb. Ytterbium.
Yd. *or* yd. Yard.—Yds., Yards.
Ye *or* ye. The; Thee.
Ym. *or* ym. Them.
Y.M.C.A. Young Men's Christian Association.
Yn. *or* yn. Then.
Y.P.S.C.E. Young People's Society of Christian Endeavor.
Yr. *or* yr. Their.
Yr. Your; Year.
Yrs. Yours; Years.
Ys. *or* ys. This.
Yt. *or* yt. That.
Yt. Yttrium.
Y.W.C.A. Young Women's Christian Association.

Z.

Zach. Zachary.
Zech. Zechariah.
Zeph. Zephaniah.
Z.G. Zoölogical Garden.
Zn. Zinc.
Zoöl. Zoölogy; Zoölogical.
Zr. Zirconium.

See ABBREVIATIONS, Vol. I, pp. 26–29.

ABBREVIATORY SIGNS and symbols are extensively employed in commerce and in various arts and sciences. With brevity as the principal reason for their existence, many are of purely arbitrary origin. Others, of later adoption, possess a scientific reason for their use. The principal abbreviatory signs may be classified as follows:

APOTHECARIES' SIGNS. The following arbitrary signs indicate apothecaries' weights:

℈ Scruple. ʒ Dram.
℥ Ounce. ℔ Pound.

The prescriptions of physicians are written in Roman notation, a small j being used for small i when final. Thus, 2 scruples are written ℈ij; 7 drams, ʒvij; 12 ounces, ℥xij.

Ancient apothecaries and physicians carefully concealed from others all knowledge of the mixtures given as medicines, and hence Latin names were given, and arbitrary signs used to express the quantity.

In apothecaries' fluid measure the following signs are used:

♏ Minim (about equal to a drop of water).
f ʒ Fluid dram.
f ℥ Fluid ounce.
O. Pint. (Lat. *octarius*, one eighth.)
C. or *Cong.* Gallon. (Lat. *congius.*)

In medicine ℞ means "take," M (*Misce*) is used for "mix," and ā or āā imports "of each" the same quantity.

ASTRONOMICAL SIGNS. See ASTRONOMY, Vol. II, p. 771.

CHEMICAL SYMBOLS. The elements are represented by accepted abbreviations, termed symbols. See ABBREVIATIONS, s. v.

COMMERCIAL SIGNS.

$ Dollar.
£ Pound sterling.
/ Shilling; as, 5/6=five shillings and sixpence.
% Per cent.
@ 1. At; 2. To.
℀ Account.
A1. First class.
A/O On account of.
A/S Account of sales.
B/E Bill of exchange.
B/L Bill of lading.
B/S Bill of sale.
¢ Cent.
C. F. I. Cost, freight and insurance.
C/O Care of.
D/S Day's sight.
F. A. A. Free of all average.
F. P. A. Free of particular average.
L/C Letter of credit.
O. K. All correct.
℗ Per.
# Number.

TYPOGRAPHICAL SIGNS. See Table under PROOF-READER, in these Supplements.

UNCLASSIFIED SIGNS.

& *or* & And.
&c. Et cetera.
* Capital.
⊙ County seat. } On maps.
++++ Railroad. }

ABBT, THOMAS, a German writer; born at Ulm, in 1738. In his twenty-third year he was appointed to the chair of mathematics in the Rinteln University. In the same year he published *On Dying for One's Fatherland;* and the year before his early death his principal work, *On Merit.* He died at Bückeburg, Nov. 3, 1766.

ABD, an Arabic word meaning slave or servant. It is generally used in a religious sense, and is placed as a prefix to the names of persons; as, Abd-allah, "Servant of God"; Abd-el-Kader, "Servant of the Mighty One"; Abd-ullatif, or Abd-allatif, "Servant of the Gracious One." The Hebrew and Syriac word used in the same sense is "Ebed."

ABD-AL-RAHMAN, ABD-EL-RAHMAN, ABD-ER-RAHMAN, OR ABDERAME; four Spanish Mohammedan rulers. See SPAIN, Vol. XXII, pp. 310, 312, 313, 314.

ABD-EL-HAMID, BEY, the adopted name of DU COURET, a noted French traveler; born at Huningue, in the department of the Haut-Rhin, France, in 1812. His first tour of importance was through Egypt, the Nile country, Abyssinia, and the Red Sea. He adopted the habits and customs of the East, changed his name, and became a Mohammedan. Later, while traveling in Persia, he was held as a prisoner of state, and was released only upon the intervention of the French government, in whose interest he next undertook an expedition to the Soudan. In 1855 he published, in three volumes, *Médina et la Mekke*, also *Mémoire à Napoléon III.* Died in Cairo, Egypt, April 1, 1867.

ABD-EL-LATIF. See ABDALLATIF, Vol. I, p. 30.

ABDOMINAL SURGERY. See SURGERY, Vol. XXII, pp. 690–91, and in these Supplements.

ABDUL-AZIZ, SULTAN OF TURKEY, born Feb. 9, 1830. In 1861 succeeded his brother, Abdul-Medjid, who was the thirty-second sultan of the Ottoman Turks. His reign was weak and corrupt, characterized by numerous insurrections. His professions of liberality upon accession to the throne lasted but a short time, and his people soon saw

that his promise of governmental reform would come to naught. He taxed the people heavily, and with the money equipped his army extravagantly, beautified the capital, and went on pleasure-seeking journeys or costly hunting expeditions. In 1867 he paid a visit to western Europe, but his disappointed subjects gained no benefit from the expedition. During his reign the neglected government had a severe struggle to maintain its existence. First there broke out the Cretan insurrection; then came the struggle of Roumania and Servia to secure independence, and lastly, the treatment of Balkan Christians caused great disturbance. In 1871 the sultan attempted to secure the throne for his son in place of his nephew, to whom the Ottoman law of succession gave the right. At last his subjects became thoroughly dissatisfied, and in 1875, through his financial difficulties and the intrigues into which he had entered with Russia, revolts were raised in Bosnia, Herzegovina and Bulgaria. A conspiracy forced him first to dismiss his ministers, and afterward, May 30, 1876, to abdicate the throne. His death occurred mysteriously four days later. See TURKEY, Vol. XXIII, p. 651.

ABDUL HAMID I, SULTAN OF TURKEY, twenty-sixth ruler of the House of Othman, succeeded to the throne in 1774, Turkey being then engaged in that war with Russia which terminated disastrously for her a year later. The sultan concluded peace by the treaty made at Kutchuk-Kainardji, by which Turkey lost the Crimea. The encroachments of Catherine of Russia provoked so much discontent in Turkey that Abdul-Hamid was compelled by his subjects to declare war in 1787; but, Austria combining with Russia, the Turks were defeated and Abdul-Hamid overthrown in 1788. He was succeeded by Selim III. See TURKEY, Vol. XXIII, p. 647.

ABDUL–HAMID II, the reigning Sultan or Padishah of Turkey, born Sept. 22, 1842 (15 Shaban, 1245), the second son of Sultan Abdul-Medjid; succeeded to the throne on the deposition of his insane elder brother, Sultan Murad V, Aug. 31, 1876.



ABDUL-HAMID II.

The present Sultan is the thirty-fifth in descent from Othman, the founder of the empire, and the twenty-eighth sultan since the conquest of Constantinople. According to the Ottoman law of succession the crown descends among the male descendants of Othman, sprung from the imperial harem, but in strict order of seniority. The heir apparent of the Turkish empire is therefore the present Sultan's brother, Mehemmed-Reshad Effendi, born Nov. 3, 1844, in preference to Abdul-Hamid's own children. The Sultan is succeeded by his eldest son only in case there are no uncles or cousins of greater age living.

It is mainly in relation to the Armenian question (q.v.) that the present occupant of the Turkish throne has attracted attention. He resisted every reform demanded by the European powers and has been accused of ordering the massacre of Christians in certain parts of his dominions. Outrage and rapine have followed his newly appointed governors to the disturbed provinces, and the civilized world has been not only aghast, but supine, at the merciless persecutions carried on by the present rule of the "unspeakable Turk."

ABD–ER–RAHMAN, sultan of Fez and Morocco; born Nov. 28, 1778. He ascended the throne upon the death of his uncle in 1822, and the first four years of his reign were spent in settling domestic disputes. The piratical propensities of his subjects involved him in serious difficulties with the European powers, which resulted in the abolition of the blackmail, which for ages had been paid for immunity from attack. The sultan afterward engaged in the religious war, under Abd-el-Kader, against the French in Algeria, which ended in the battle of Isly (1844). He died August, 1859.

ABDURRAHMAN KHAN, the reigning Ameer of Afghanistan; born about 1830; is a nephew of the late ameer, Shere Ali, and the eldest son of Mohammed Afzul Khan, grandson of Dost Mohammed. For joining in a revolt against his uncle he became, in 1869, a refugee in Russian territory. Ten years later he returned as a pretender, and being supported by the British was proclaimed Ameer in July, 1880. The Ameer's leanings are essentially toward alliance with the British, and against Russian encroachments in the East. He was appointed a K.G.C.S.I. in January, 1894, and in the following year sent his second son, the Shazada Nasrullah Khan, on an extended visit to England. See also AFGHANISTAN, these Supplements.

ABDY, JOHN THOMAS, an English jurist and writer; born July 5, 1822; educated at Cambridge University, where he subsequently, in 1854, was appointed regius professor of civil law. For several years he was a county court judge and published several standard legal works, especially commentaries upon the Roman civil law.

ABECEDARIANS, a sixteenth century sect of Anabaptists in Germany, founded by Nicholas Stork, a weaver of Zwickau. They were especially noted for their fanatical ideas with regard to education, teaching that the merest rudimentary learning was unnecessary, and led to evil consequences. The Lord, they said, would communicate sufficient understanding to such as desired to read the Bible.

A'BECKETT, ARTHUR WILLIAM, an English journalist, dramatist and miscellaneous writer, son of Gilbert Abbott A'Beckett (see Vol. I, p. 33), the London police magistrate and man of letters; born at Hammersmith, Oct. 25, 1837. He edited several comic publications and periodicals, and was special correspondent for the *Standard* and *Globe* during the Franco-Prussian War. He was on the staff of *Punch*, and in 1891 became the editor of the *Sunday Times*. He wrote several novels and some popular comedies. Died in London, Oct. 15, 1891.

A'BECKETT, SIR WILLIAM, an Australian judge, brother of G. A. A'Beckett (Vol. I, p. 33); was born in London and went to New South Wales soon after

his call to the bar. He was in succession solicitor-general, attorney-general and judge at Port Philip. He served as chief justice of the colony of Victoria for many years, and returning to London, died there June 27, 1869.

ABEEL, DAVID, American missionary, born at New Brunswick, New Jersey, June 12, 1804. He graduated at Rutgers College, entered the ministry, and became a missionary to China. He was one of the most successful of the early Americans in the missionary field, but his health gave way and he returned to die, at Albany, New York, Sept. 4, 1846.

ABEGG, JULIUS FRIEDRICH HEINRICH, a German writer on jurisprudence, born at Erlangen, Bavaria, March 27, 1796. From 1826 until his death in 1868 he was professor at Breslau. His works on criminal legislation are numerous and important, and have exercised considerable influence, especially in Germany and the Scandinavian peninsula. Died at Breslau, Prussia, May 29, 1868.

ABEL, SIR FREDERICK AUGUSTUS, an English chemist and expert on explosives, was born in London, 1827. His main study was the science of explosives, in which he made numerous discoveries, and in 1866 published them in a work called *Gun-Cotton*. Subsequently, he wrote *The Modern History of Gunpowder; On Explosive Agents; Researches in Explosives*, and in 1884, *Electricity Applied to Explosive Purposes*. He also wrote, with the assistance of Colonel Bloxam, a *Handbook of Chemistry*. After protracted experiments he produced, by solidifying blasting-gelatin, a very powerful and more easily manageable explosive. He was knighted in 1883, and the same year received at Oxford the degree of D.C.L. He has been elected associate member of the ordnance committee, chemist to the war department, and chemical referee to the government. Was made baronet in 1893.

ABEL, KARL, a German comparative philologist; born in Berlin, Nov. 25, 1837. He studied at the Universities of Berlin, Munich and Tübingen, and for some time acted as the Berlin correspondent of the London *Times* and *Standard*. He held the position of Ilchester lecturer at Oxford University for a period, and is the author of several works on comparative philology, among which may be mentioned his *Linguistic Essays* (1880).

ABELASIE, an aromatic tuber used as a food by certain of the inhabitants of Alexandria. It is small, fleshy and somewhat oily, and is said to stimulate the lacteal glands of females.

ABELITES OR ABELIANS. See ABEL, Vol. I, p. 33.

ABELL, ARUNAH SHEPHERDSON, an American journalist, founder of the Philadelphia *Public Ledger* and of the Baltimore *Sun*, was born at East Providence, Rhode Island, Aug. 10, 1806, and learned the printer's trade in the office of the Providence *Patriot*. He worked for some time in Boston and in New York, whence he removed to Philadelphia, and afterward to Baltimore. He was associated with Professor Morse in establishing the electric telegraph, published the first message sent over the wires, between Washington and Baltimore, in 1844, and received for publication the first presidential message ever transmitted by wire, May 11, 1846. He died in Baltimore, Maryland, April 19, 1888.

ABENAKIS OR ABNAKIS, a confederation of North American Indians, comprising the Penobscot, Passamaquoddy, and Amalicite tribes. They were allies of the French, and occupied all the land comprising the present state of Maine and the valley of the St. John's River, ranging as far northwest as the banks of the St. Lawrence. Colonial writers and the autochthonal tribes of New England called the members of this confederation by the name of Tarrenteen Indians. Shortly after the downfall of French supremacy in North America the majority of the Abenakis withdrew to Canada. Their number does not exceed 1,600 at the present day.

ABENDBERG, a mountain in the canton of Berne, Switzerland, rising abruptly out of the south side of Lake Thun. Height, 4,124 feet. It is interesting as the site of an institution established in 1842 by Dr. Gugenbuhl for the cure of cretinism, but long since abandoned.

ABER, an ancient word of Celtic origin, signifying the emptying of a smaller body of water into a larger one. It also means the mouth of a river, or a conflux of waters.

ABERBROTHOCK, same as ARBROATH. See Vol. II, p. 324.

ABERCORN, a hamlet in Linlithgowshire, Scotland, near the Firth of Forth, and about ten miles west of Edinburgh. Here stood the monastery of Aebbercurnig, or Eoricorn, which, founded about 675, was from 681 to 685 the seat of a bishopric, the earliest in Scotland.

ABERCORN, JAMES HAMILTON, FIRST DUKE OF, an English statesman, born Jan. 21, 1811. He held the appointment of lord-lieutenant of Ireland from 1866 to 1868, and again from 1874 to 1876. His administration was extremely successful, in spite of repeated Fenian plots. He died Oct. 31, 1885.

ABERCORN, JAMES HAMILTON, SECOND DUKE OF, an English statesman; born 1838, and succeeded to the title 1885; appointed lord-lieutenant of county Donegal, which he represented in the House of Commons from 1860 to 1880. The Duke of Abercorn is chairman of the British South African Company.

ABERCROMBIE, JAMES, British general and statesman, born at Glasshaugh, Scotland, in 1706. He entered the army and became colonel in 1746, major-general in 1756, lieutenant-general in 1759, and general in 1772. On July 8, 1758, he attacked Fort Ticonderoga with 15,000 men, of whom 9,000 were colonial troops, and was completely defeated by 3,600 Frenchmen under General Montcalm, losing about 2,000 followers. In 1759 he returned to England, and as a member of Parliament opposed the rights of the American colonists. He died at Stirling, Scotland, April 28, 1781.

ABERCROMBIE, JAMES, American clergyman, was born in Philadelphia in 1758. After graduation at the University of Pennsylvania in 1776, he was compelled to forsake divinity for mercantile pursuits until 1793. Then he was ordained and became associate pastor of Christ Church in his native city. He published several works, and, retiring from

the ministry in 1833, died in Philadelphia, June 26, 1841.

ABERCROMBIE, JOHN JOSEPH, an American general, was born in Tennessee in 1802; was educated at West Point, and served as captain of infantry in the Seminole War. During the Mexican War he distinguished himself at Cerro Gordo and at Vera Cruz, being wounded at Monterey. He was brigadier-general of volunteers during the Civil War, and was wounded at Fair Oaks. He died at Roslyn, New York, Jan. 3, 1877.

ABERDARE, a manufacturing and mining town in Glamorganshire, South Wales, distant about five miles southwest of Merthyr-Tydvil. There are many coal and iron mines in this locality. Population 1891, 38,513.

ABERDARE, HENRY AUSTIN BRUCE-PRYCE, LORD, was born at Duffryn, in Glamorganshire, April 16, 1815. He was called to the bar in 1837, and in 1852 was returned as a Liberal member for Merthyr-Tydvil in the House of Commons. He was home secretary under Gladstone in 1868, and carried an important licensing act; raised to the peerage as Lord Aberdare in 1873, when he became Lord president of the council. He was elected president of the Royal Geographical Society in 1880, and was governor of the Royal Niger Company. He died Feb. 25, 1895.

ABERDEEN, a town, capital of Monroe County, Mississippi, on the west bank of the Tombigbee River, has considerable trade in cotton and general merchandise; is an educational center, and contains the Federal courthouse and the public buildings of Monroe County. Population 1890, 3,449.

ABERDEEN, county seat of Brown County, South Dakota, about 120 miles northeast of Pierre, and in the northeastern portion of the state. It is a railroad and trading center in a fertile region. Population, 1895, 3,335.

ABERDEEN, JOHN CAMPBELL HAMILTON GORDON, SEVENTH EARL OF, was born Aug. 3, 1847. He was the grandson of the fourth Earl, under whom, as premier, the Crimean war was carried on (see Vol. I, p. 46). He succeeded to the title and estates on the death of his brother, Jan. 27, 1870. He was educated at College Hall, Aberdeen University, and at University College, Oxford. He began his political career as a member of the Tory or Conservative party, but early in Beaconsfield's last government, 1874–80, he began to show signs of discontent with the policy of the premier. Earl Aberdeen was a member of, and subsequently chairman of, a royal commission to enquire into the subject of railway accidents, 1875; three years later he was one of a House of Lords' committee upon the question of temperance. When Gladstone came into office in 1880 he appointed him Lord-Lieutenant of Aberdeenshire, and High Commissioner to the General Assembly of the Church of Scotland. In 1886 he was appointed Lord-Lieutenant of Ireland, and in his few weeks of service gained an immense popularity in that island. In 1893 Mr. Gladstone appointed him Governor-General of the Dominion of Canada, where his government was successful. Lady Aberdeen is noted for her interest in the advancement of women, and in the Irish.



JOHN CAMPBELL HAMILTON GORDON.—EARL OF ABERDEEN.

ABERDEEN UNIVERSITY was founded at Aberdeen, Scotland, in 1495 by Bishop Elphinstone as a *studium generale*, in which he constituted a college in 1505, known as King's College. In 1593 George Keith, fifth Earl Marischal, founded Marischal College there. These two universities were in 1860 united in one institution, and now form the University of Aberdeen. There are 23 professors and upward of 700 students on the books of the university, which, with Glasgow, sends one representative to Parliament. Co-education is in operation, and degrees are conferred in arts, science, divinity, law and medicine. (See Vol. I, p. 39.)

ABERDEVINE, same as ABADAVINE. See SISKIN, Vol. XXII, p. 99.

ABERGAVENNY, a market town of Monmouthshire. Population 1891, 7,640. See Vol. I, p. 46.

ABERGELDIE CASTLE, the Highland seat of the Prince of Wales, on the Dee's right bank, 6 miles W. of Ballater, and 2 N.E. of Balmoral, in the county of Aberdeen.

ABERNETHY, JAMES, a celebrated English civil engineer; born in Aberdeen in 1815. Commencing his professional career as an assistant to his father, on the engineering-works at the London docks extension, he was soon after resident engineer in charge of the Aberdeen harbor-works. Later he was professionally connected with some of the most important engineering-works of the day, including the dock-works at Swansea, Newport and Hull. In 1874 he superintended the reclamation of Lake Aboukir, in Egypt, and from 1882 until its completion was the consulting engineer for the great Manchester ship canal. Mr. Abernethy was elected president of the Institute of Civil Engineers in 1881.

ABERT, JOHN JAMES, American military topographical engineer, born at Shepherdstown, Virginia, Sept. 17, 1788. He graduated at West Point in 1811, and was employed in the War Department. He studied law and was admitted to the bar in 1813. He volunteered for the defense of the capital in the War of 1812, and in 1814 was reappointed to the army as brevet major of the United States Topographical Engineers. In 1829 he took charge of the topographical bureau at Washington, and in 1861 retired, after "long and



JOHN JAMES ABERT.

faithful service." He died in Washington, District of Columbia, Sept. 27, 1863.

ABERYSTWYTH. The University College of Wales has been established at Aberystwyth as one of the colleges composing the University of Wales. Previously, and for many years, maintained by voluntary donations, it has since 1886 been in receipt of an annual government grant of twenty thousand dollars. In addition to the ordinary courses in art and science, the college possesses a department of agriculture and a normal department. Co-education exists, 145 of the 350 students in 1895 being women. See ABERYSTWYTH, Vol. I, p. 48.

ABEYANCE, in law, is the condition of property, real or personal, when no person exists in whom the title is vested. The law requires that a freehold shall never be in abeyance if it can be prevented, and will adopt almost any pretext to vest the title in some existing person to prevent its remaining in abeyance. It is asserted by some that there is no such thing as an estate in abeyance. Titles of honor and of dignity are in abeyance when it is uncertain who shall enjoy them. The title to personal property may also be in abeyance, as in replevin suits, where the ownership of property is in dispute, and the property itself is in the custody of the law pending its delivery to the successful claimant. In such case the title is said to be in abeyance until the determination of the suit.

ABGILLUS, JOHN, son of a Frisian king, was converted to Christianity and accompanied the emperor Charlemagne on some of his expeditions. His ascetic life gained for him the appellation of prester or priest, thus occasionally causing him to be confounded with the Mongolian Prester John of the eleventh century.

ABHORRERS AND PETITIONERS, the names given to two political factions in the reign of Charles II, king of England (1679–80). In some principles they were the germs of the present Whigs and Tories. The origin of the factions was when Lord Shaftesbury procured, by intrigue, a host of petitions from the rural districts, asking the king and Parliament to set aside, not only the succession of James, the brother of the king, but also his daughter, Mary, who was a Protestant, and married to William, Prince of Orange, and to fix the succession on the Duke of Monmouth, one of the king's illegitimate children. A strong party objected to this injustice, and obtained numerous counter-petitions, declaring the signers' "abhorrence" of Shaftesbury's scheme.

ABIATHAR. See ISRAEL, Vol. XIII, p. 404.

ABIB, the Jewish month Nisan. See CALENDAR, Vol. IV, p. 678.

ABICH, WILHELM HERMANN, a German geologist and traveler, was born in Berlin, Dec. 11, 1806. He studied natural science at Berlin, became professor at Dorpat in 1842, fellow of the St. Petersburg Academy in 1853, and after 1877 lived at Vienna. He explored the Caucasus region, the Armenian highlands and northern Persia, and his published works are invaluable geological and mineralogical memoirs on these countries. He died at Graz, July 2, 1886.

ABIES. See FIR, Vol. IX, p. 222.

ABIGAIL, the wife of Nabal, the rich churl of Carmel, and after his death the wife of David, king of Israel. When David marched against Nabal she met him with a present, and calling herself "his handmaid" (1 Sam. xxv. 3), she, while averting Nabal's punishment, was the cause of her name being used as a modern synonym for a serving or waiting woman. Another notable instance of the name in a similar character is in Beaumont and Fletcher's play of *The Scornful Lady*. The mother of Amasa and sister of David also bore this name. Abigail Hill (or Abigail Earwig, as her enemies called her) was the waiting-woman who supplanted Sarah Jennings, the first Duchess of Marlborough, in the favor of Anne, queen of England, and in so doing gave a further lease of life to the use of this synonym.

ABILENE, a tetrarchy and district of Syria, in the political geography of the ancients. It was situate to the eastward of Antilibanus.

ABILENE, the county seat of Dickinson County, Kansas, on Smoky Hill River, about 85 miles W. of Topeka. It was formerly an important shipping center for cattle. It is a railroad center for the Santa Fé, Rock Island, and Union Pacific railroads. Population 1895, 3,400.

ABILENE, capital of Taylor County, Texas, about 200 miles to the N.W. of Austin. Population 1890, 3,194.

ABINGDON, a town of Knox County, in the northwest portion of Illinois, at the intersection of the Galesburg division of the Chicago, Burlington and Quincy and Iowa Central railroads. Abingdon is 85 miles N.E. of Quincy and 10 miles S. of Galesburg. It is the seat of Abingdon Normal and Hedding colleges, and is in the midst of a fertile agricultural district. Population 1896, 2,000.

ABINGDON, an historical town of Virginia, county seat of the first county named in honor of Washington, is agreeably situated near Walker's Mountain, in the extreme southwest part of the state. There are stations of the Norfolk and Western and Virginia Western railways here. It is the seat of a Roman Catholic academy and convent, the library of the Maury Literary Society, Stonewall Jackson Institute, Abingdon Male Academy, and Martha Washington College for Girls. Deposits of gypsum, salt and iron ore are found here. During the Civil War Abingdon furnished quantities of salt to the Confederacy. Population 1895, about 1,700.

ABINGER, SIR JAMES SCARLETT, BARON, a distinguished English jurist, was born in Jamaica in 1769. He was attorney-general in 1827 and 1829, and in 1834 he was appointed chief baron of the court of exchequer. He died at Bury St. Edmunds, April 7, 1844.

ABINGTON, a town in Plymouth County, Massachusetts, distant about 20 miles S.E. of Boston, on the Plymouth branch of the Old Colony railroad. The principal industries are the manufacture of machinery and boots and shoes. Population 1895, 4,207.

ABLAUT, a German technical term in scientific grammar, best rendered into English by the expression, *vowel gradation*, such as takes place in the verb

*sing, sang, sung.* A kindred expression, *umlaut*, or mutation, is used to denote the changes of the vowel in the formation of the plural of a word; as in cow, *kine;* louse, *lice*, and similar words.

ABNAKIS, an Indian family. See ABENAKIS, in these Supplements.

ABNEY, WILLIAM DE WIVELESLIE, an English soldier and scientist, born at Derby in 1843. Entering the royal engineer corps, he rose to the rank of captain, and was for some time instructor in chemistry to the Royal Engineers at Chatham. Captain Abney was one of the scientific observers of the transit of Venus in 1874. He wrote PHOTOGRAPHY, Vol. XVIII, pp. 821–40, in this ENCYCLOPÆDIA.

ÅBO, TREATY OF PEACE OF, a treaty signed at Åbo, Aug. 17, 1743, between Russia and Sweden. By its terms Russia obtained the southern portion of Finland as far as the river Kymen, and secured the election of an ally as prince royal of Sweden.

ÅBO–BJÖRNEBORG, a län or province of Russian Finland, containing some 9,335 square miles, and situate on the Gulf of Bothnia. The chief town of the province is Åbo. Population of the province 1895, 399,534. See RUSSIA, Vol. XXI, p. 69.

ABOLITIONIST. While popularly and primarily meaning one who sought the abolition of all human slavery, and in this sense used as long ago as 1790 by one of the earliest Abolitionists, Thomas Clarkson, the term *Abolitionist*, in the United States, must be considered as more often referring to the members of a semi-political party, to a certain extent composed of Republicans, and in contradistinction to the Southern Democrats, who, to a man, were apologists of slaveholding. While this anomaly of a semi-political party, which nominated no candidate for office, and yet was sufficiently powerful to influence elections, is unquestionably attributable to the agitation started by William Lloyd Garrison in 1829, seconded as it was so ably by the silvery eloquence of Wendell Phillips, and supported by a rapidly growing New England party, the term soon became an opprobrious epithet, in the mouth of a Southerner, wherewith to stigmatize the entire Northern population who differed from him in regard to politics, and, above all, in relation to the burning question of the future of the slavery question. Even in the ranks of the Abolitionists themselves were differences and divisions. One section timorously, and a trifle tentatively, contented themselves with a mild and general denunciation of slavery as an abstract question. The extreme wing and the more powerful portion of the Abolitionist party, under the impassioned eloquence of Wendell Phillips, hesitated not to denounce even the constitution itself as the bulwark of slavery. In point of fact there never was a time when the entirety of America had acquiesced in slavery. The Quakers had long been its unalterable opponents, and the virulence of the struggle increased when the anti-slavery agitator could point to the English colonies as an evidence of the benefits accruing from the emancipation of the African slave, and in so doing could, and did, cast a reflection on the tardiness and anomalous injustice of his own ideal republic. The fiery and impassioned utterances of the Abolitionist school soon began to bear fruit. Stung to the quick, the Southern slaveholder, and the Southwestern sympathizer with slavery, or anything to antagonize the North, soon began the series of outrages on Abolitionists, destined to turn the flood of sympathy in favor of the negro's freedom. The murder of Lovejoy, the protomartyr of the cause, at Alton, in 1839, the savage penalties inflicted on escaping slaves, or those who aided their efforts, culminated, as a natural sequence, in the election of the champion of the Republican party, Abraham Lincoln. Then the question of the future of slavery had to be referred to the arbitrament of the God of battles, in case of any opposition to the freely expressed intention of secession. With the first shot against Sumter the fanatic of the Free-Soil movement, John Brown, became the martyr of freedom's cause, and his name the battle-cry that rang from Manassas to Appomattox. Lincoln issued his famous proclamation of Sept. 22, 1862, as a warning to the Southern states in rebellion, and on Jan. 1, 1863, in its operation it removed the bonds from every slave. As a matter of interest, one may draw the comparison, that, while the British could effect the peaceful emancipation of 770,280 slaves in the West Indies at a cost of $150,000,000, the freedom of the American negro cost the nation the enormous sum of $7,000,000,000 and the lives of a million of its best men, and this without the slaveholder receiving a solitary cent as compensation for his loss.

ABOU-GIRGEH, a village on the west bank of the Nile, about 100 miles S. of Cairo, inhabited by fellahs, who are engaged in agriculture. Population in 1896, about 3,000.

ABOUSAMBUL, same as ABU-SIMBEL. See Vol. I, p. 61; also ARCHITECTURE, Vol. II, p. 388.

ABOUT, EDMOND FRANÇOIS VALENTIN, a French novelist, journalist and playwright; born at Dieuze, Feb. 14, 1828; educated in Paris. He spent two years at Athens, returning to Paris in 1853 to commence a journalistic career. His first literary venture was a satire on the customs and domestic manners of the modern Greeks, which owed much of its domestic popularity to the annoyance it caused the subjects of his witticisms. His first novel, *Tolla Feraldi*, was published in the pages of the *Revue des Deux Mondes*. *Les Mariages de Paris* was first published in the columns of the *Moniteur du Soir*. Other books followed rapidly. In 1868, About was decorated with the cross of the Legion of Honor, possibly as a reward for his inspired *Question Romaine* (1860). He acted as war correspondent for *Le Soir* in the Franco-Prussian war. About's many novels and short stories are characterized by a droll fantastic humor, and evince considerable ingenuity in serio-comical plots and situations. In 1884 he was elected a member of the French Academy, but died before taking his seat, Jan. 17, 1885.

ABOVILLE, FRANÇOIS MARIE, COMTE D', a French soldier, who rendered service to America in the war of the Revolution. Born at Brest, in 1730, his early history is obscure. He came to the aid of

the colonists with Rochambeau, and was director of the artillery at the siege of Yorktown. Returning to France at the close of the Revolution, he became, governor of Brest in 1807. He was an adherent of the Bourbons, and was created a peer of France. He died Nov. 1, 1819.

ABRAHAM, PLAINS OR HEIGHTS OF, an elevated plateau immediately to the southwest of the city of Quebec, Canada, above the river St. Lawrence. It was the scene, Sept. 13, 1759, of a decisive battle between the forces of the English and colonial troops, under General James Wolfe (q. v., Vol. XXIV, p. 630), and the French and Indians under the Marquis de Montcalm. Wolfe, thrice wounded, died in the moment of victory, his opponent, mortally injured on the field, expiring in the city of Quebec. The result of the battle was the fall of the city, and, ultimately, the loss to the French of the whole of Canada.

ABRAHAMITES, a small sect of Bohemian deists whose most noticeable peculiarity was that they rejected all the doctrines of the church, professing to follow the religion of the patriarch Abraham before his circumcision. They obtained a short-lived prominence near Pardubitz, whence they were expelled in 1783. The term is also used of a branch of the Paulicians, of whom Abraham of Antioch was the leader.

ABRAHAM-MEN. At first this term only referred to a lunatic mendicant from Bethlehem Hospital, in London. Here the wards were named in honor of various saints and patriarchs. The inmates of the Abraham ward were allowed liberty on certain days, and used the opportunity to beg for themselves and fellows. Their badges and the name of the ward soon obtained for them a familiar name, which, as success begat imitation, was applied to every sturdy vagrant who suffered from or simulated insanity.

ABRAHAMSON, WERNER, Danish poet and critic. See DENMARK, Vol. VII, p. 91.

ABRANTES, DUC D'. See JUNOT, Vol. XIII, p. 779.

ABRIDGMENT. See COPYRIGHT, Vol. VI, p. 361.

ABROLHOS (Port. Open your eyes), a group of small islets off the coast of Western Australia, about 100 miles N. of Perth, and between 28° and 29° S. lat. They are separated from the mainland by the Ceelvink Channel.

ABROLHOS ROCKS, a cluster of reefs and low, rock-bound islets in the South Atlantic Ocean, off the coast of Brazil, and immediately east of Caravellas. They are situated about 710 miles north of Rio de Janeiro, in lat. 17° 58′ S., long. 38° 42′ W.

ABRUZZI E MOLISE, Italian province. See ABRUZZO, Vol. I, p. 56; also MOLISE, Vol. XVI, p. 631.

ABRUS, a genus of the family *Leguminosæ*, a native of India, but now found in all tropical countries. The root is often used as a substitute for licorice. The round, parti-colored (scarlet and black) seeds are used as beads for necklaces, rosaries, etc., and as a remedy for certain diseases.

ABSCISSA. See CONIC SECTIONS, Vol. VI, p. 275.

ABSCOND. To abscond is to depart clandestinely from one's usual place of residence, or to lie concealed, with the intent to avoid legal process. An absconding debtor is one who departs from the state or from his usual abode, or who secretes or conceals himself, with the intent to hinder and delay or defraud his creditors. The statutes of the various states usually define who shall be treated as absconding debtors, but generally it is not necessary that the debtor should depart from the state, but it is essential only that there be a concealment beyond the reach of the process of the court, with the intent to delay or defraud creditors.

ABSECON OR ABSECOM, the name of a bay, an inlet and a village on the coast of New Jersey, northeast of Atlantic City. Here is a lighthouse for the protection of the numerous vessels making the port of New York from the southward. The inhabitants of the village are mostly fishermen. Population 1895, 522.

ABSENTEE, a term applied, by way of reproach, to landlords deriving their income in rent from estates in one country, but residing and expending the income in another. It was first, and is still in the main, used in relation to the Irish landlords, for whom the capitals of Europe have long held attractions superior to those of their own country. The objection to absenteeism is far from a fanciful grievance. Its tendency and result is to place agents and bailiffs in the place of the landlord, with interests inimical to those of the tenant. The needs of a tenant receive but slight attention at the hands of a bailiff, whose main object is the remittance of as much rent as possible to the absentee landlord. The question of absenteeism has become one of moment in the United States, where tracts of lands, in some cases larger than whole European principalities, have been purchased by alien capitalists. Several of the states have found it advisable to regulate alien ownership by legislation. See also IRELAND, Vol. XIII, p. 229.

ABSOLUTISM, a form of government in which the executive power is not controlled or limited by any constitutional restrictions. On the downfall of the feudal system in Europe the golden era of absolutism ensued. Based on the subordination of the church and nobility, and supported by large revenues and a numerous standing army, the ruler argued on the assumption of divine right much in the strain of Louis XIV's *L'état, c'est moi* (I am the state), for Louis was the representative absolute monarch.

ABSOROKAS. See CROW INDIANS, in these Supplements.

ABSORPTION, in plants, depends upon the activity of their protoplasm and is a fundamental nutritive process. It chiefly concerns the absorption of water and other substances from without, but cells also absorb from each other. The food of plants is always absorbed in fluid form, either as a liquid or a gas. The liquid food is water containing various substances in solution, and the absorbing organ is usually the root. The gaseous food is mostly carbon dioxid and is absorbed from the air by all green parts of the plant, but chiefly by the

leaves acting as organs of gas absorption. Submerged water-plants, parasites, air-plants, insectivorous plants, all have the work of absorption somewhat modified by their sources of food.

ABSORPTION. See ELECTRICITY, in these Supplements.

ABSTINENCE, ECCLESIASTICAL. See FASTING, Vol. IX, p. 44.

ABSTINENCE, TOTAL, AND ABSTINENCE SOCIETIES. See TEMPERANCE SOCIETIES, Vol. XXIII, pp. 158–60.

ABSTINENTS, a sect of the Manichæans who were prominent in Spain and France in the third century. See MANICHÆISM, Vol. XV, p. 481–7.

ABSTRACT OF TITLE, a brief summary, generally in chronological order, of the various deeds, wills, legal proceedings and other matters of public record constituting the history of the title to or interest in real estate. An abstract should show the material portion of all transfers of title, as well as all encumbrances and liens, from the time of the issuance of the patent from the government or other original source of title, so that one familiar with the laws concerning real estate may be able from its examination to determine accurately the condition of the title.

In the United States, where conveyancing is much less involved and complicated than in England, and where offices for the recording of deeds are universal, and the recording laws such that it is exceedingly unsafe to neglect the placing of all conveyances upon record, abstracts are much more simple and inexpensive than in England. See CONVEYANCING, in these Supplements.

ABT, FRANZ, a noted German musician and songwriter; born at Eilenburg, in Prussian Saxony, Dec. 22, 1819. He was intended and educated for the church. While studying at the University of Leipsic, he became, through his father's death, the sole support of his mother. To do this he obtained work as a teacher, slowly pursuing meanwhile his studies in music. Soon after the publication of his first musical compositions, in 1838, Abt was appointed conductor of the Leipsic Philharmonic Society; subsequently holding similar positions in other German towns. His most famous song, *When the Swallows Homeward Fly*, was first published in Stuttgart. Thenceforth his fame was assured. Abt visited the United States in 1872, conducting many concerts in the principal cities of the Union. His published works are numerous, his songs being characterized by a remarkable gift of melody. Hardly a German or American singing society exists where his songs have not been sung and admired. He died in Wiesbaden, April 3, 1885.

ABUKIR. See ABOUKIR, Vol. I, p. 52.

ABULCASIS OR ABULKASIS. See MEDICINE, Vol. XV, p. 805; SURGERY, Vol. XXII, p. 675.

ABU-KLEA, a group of wells in the Nubian desert, in the bend of the Nile, between Korti and Shendy, north of Khartoum. The place was the scene of a battle on Jan. 17, 1885, in which the British troops under Sir Herbert Stewart defeated the Mahdi's forces.

ABUTILON, a genus of the family *Malvaceæ*, or "mallows." About seventy species of mostly shrubby plants, found in all warm regions. Some of them are showy and frequent in cultivation. *A. avicennæ*, a native of India, is a common weed in the United States, and is popularly known as "velvet-leaf."

ABUTMENT. See ARCH, Vol. II, p. 330; BRIDGES, Vol. IV, p. 324.

ABYDOS, Hellespontine, a town in Mysia, Asia Minor, famous as the location of the Bridge of Xerxes, and noted in the legend of HERO AND LEANDER, as to which see Vol. XI, p. 754.

ABYLA AND CALPE, the two opposing and rocky headlands of the Straits of Gibraltar, termed in ancient geography "The Pillars of Hercules," beyond which all was mystery and unknown. Abyla corresponds with the modern Jebel Musa or Apes' Hill, in Africa, while Calpe is, of course, the Rock of Gibraltar.

ABYSMAL ACCUMULATIONS. See FORAMINIFERA, Vol. IX, pp. 382–85.

ABYSSINIA. For early history and general description of the country, see ABYSSINIA, Vol. I, pp. 61–67. The chronological record there given ends with the accession of Prince Kassai under the title of Negus Johannes II, in 1872. One of the Negus's first acts was to embark on a war with Egypt. In two battles the Abyssinians carried all before them. At Kherad Iska the Egyptian troops were massacred, while their valor at Gonda Gouddi (Oct. 16, 1875) did not avail to save them from a severe defeat. Then internecine troubles broke out, and Menelek, king of Shoa, was involved in warfare with Abyssinia's ruler. Johannes was killed in battle March 9, 1889, and was succeeded by his old-time opponent, Menelek, who, as all his ancestors did, claims direct lineal descent from King Solomon and the Queen of Sheba. Then Italy came into the theater of operations, and under the following circumstances: When England, in directing the policy of Egypt, decided against the retention of the Upper Nile provinces, which had been Egyptian only in name, she was prepared to abandon any claim to the Red Sea coast so long as she retained the useful coaling-station of Suakim. For centuries the lower part of the Red Sea littoral has been claimed by Abyssinia, and a port was guaranteed to her by the treaty negotiated by Admiral Hewett, in May, 1884. Egypt had also claimed this coast strip, now usually called Erythrea, and it was here that the Italians essayed to enter on a campaign of acquisition in Africa. In 1885 Italian troops occupied the port of Massowah, and soon began to extend their operations inland, until the sturdy highlanders of Abyssinia swept their troops back to the sea. By the treaty of Uccialli, signed May 2, 1889, Italy claimed a protectorate over the whole of Abyssinia, and began to extend her sphere of influence. The Abyssinians denied the right of Italy to control their foreign relations, and made all preparations to defend their soil from the cupidity of the invader. Underestimating the strength of the native troops, Italy landed 25,000 men under Generals Baldissera and Baratieri. The advance had penetrated as far as Adowa, where General Baratieri, at the head of 15,000 men, awaited the arrival of his superior

with reinforcements. On Sunday, March 1, 1896, the Abyssinians attacked the Italian troops, and after severe fighting succeeded in putting the entire force to flight. The invader's loss was over 3,000 men, including a number of officers. Nothing seemed to interpose between the Abyssinians and a triumphant march to the sea except the panic-stricken and scanty garrisons of a few fortified posts. In Italy rioting and a change of the ministry were the natural consequences of the horror excited by the news of defeat. Reinforcements were hurried to the aid of the beleaguered garrisons. In view of the uneasiness in the Soudan, it was feared that Menelek and the Mahdi would move in conjunction against Egypt, and Moslem and Christian thus combine in a holy war against the English occupation. To counteract this and keep the Mahdi's savage hordes occupied, it was decided that the troops of the Khedive, supported by British soldiery as soon as the cool season set in, should occupy Dongola and slowly advance toward Khartum. The English advance was supplemented by Indian soldiery drawn from the East Indian forces, and inured to the heat of an African desert campaign. The Italian complication was ended in the autumn of 1896 by a new treaty under which Italy withdrew her claim to a protectorate over Abyssinian states. The subjoined table gives an estimate of the extent and population of the political divisions of Abyssinia.

| Political Divisions. | Area in sq. miles. | Population. |
|---|---|---|
| Tigré, Lasta, Amhara, and Gojam | 80,000 | 2,000,000 |
| Shoa | 26,000 | 1,500,000 |
| Territory of the Bogos, Mensas, Beni-Amer, etc. | 28,000 | 100,000 |
| Territory of the Afars and Adals (Danakil) | 40,000 | 200,000 |
| Territory of the Issa and other dependent Somali tribes | 6,000 | 60,000 |
| Galla and Kaffa lands | 64,000 | 3,500,000 |
| Total | 244,000 | 7,360,000 |

Besides the chiefs and their retainers summoned in time of war, the king maintains a permanent army of *Wottoader*, or "mercenaries," most of whom are now armed with rifles instead of the national weapons, shield and lance.

There is comparatively little land under tillage, pasturage being the chief pursuit of the people, who raise large herds of cattle, as well as sheep and goats. Wild indigo, coffee, cotton, the sugar-cane, date-palm, and vine thrive well in many districts, but are nowhere extensively cultivated. The forests abound in valuable trees. The chief exports are skins, ivory, butter, gums, mules, forwarded mainly through Massowah, the exchanges of which port rose from $200,000 in 1861 to $1,400,000 in 1881. Besides Maria Theresa pieces, bales of cloth and salt are still used as currency. Towns are numerous, but are all of small size, scarcely any with a population of over 5,000. The most important, politically and commercially, are: Gondar, capital of Amhara, 5,000; Adua, capital of Tigré, 3,000; Aksum, ancient capital of the Ethiopian empire, 5,000; Antalo, former capital of Tigré, 1,000; Ankober, former capital of Shoa, 7,000; Licheh, present capital of Shoa, 3,000; Debra-Tabor, Magdala, and Makallé, occasional royal residences; Besso and Sokoto, 1,500, important trading-centers; Amba-Mariam, 4,000; Mahdera-Mariam, 4,000.

ACACIANS, a sect of the Arians (q. v., Vol. II, pp. 537, 538), named after Acacius, bishop of Cæsarea, who flourished from 340–365 A.D. The principal item of belief in which they differed from the Arians and Semi-Arians was that they held that Christ was *like* the Father, but not of the same substance. The heresy of the Acacians was condemned in two councils of the early Church—at Sardica in 346, and at the Council of Seleucia in 359.

ACADEMY, The French, an association of French men of letters, having its origin in Paris, in 1629, in the informal meeting weekly of a few men of letters for the purpose of improving the French language and regulating literary taste. It was formally established by Cardinal Richelieu on Jan. 2, 1635. It now consists of 40 members, familiarly known as the Forty Immortals. Its officers include a director and a chancellor selected by lot, and a permanent secretary elected by vote. The Academy meets twice weekly, at the Palais Mazarin, 23 Quai Conti, Paris. The present immortals are as follows (three seats, being those made vacant by the death of Alexander Dumas, fils, Jean Baptiste Leon Say and Jules François Simon, being at present unoccupied):

The Immortals:
Ernest Wilfred Gabriel Baptiste Legouvé.
Jacques Victor Albe, Duc de Broglie.
Emile Ollivier.
Henri Eugène Orléans, Duc d'Aumale.
Alfred Jean François Mézières.
Marie Louis Antoine Gaston Boissier.
Victorien Sardou.
Edmund Armand, Duc d'Audiffret-Pasquier.
Aimé Joseph Edmund Rousse.
René François Armand Sully-Prudhomme.
Charles Victor Cherbuliez.
Adolphe Louis Albert Perraud.
Édouard Jules Henri Pailleron.
Francis Edouard Joachim Coppée.
Joseph Louis François Bertrand.
Ludovic Halévy.
Aimé Marie Edouard Hervé.
Vallery Clément Octave Gréard.
Othénin P. de Cléron, Comte d'Haussonville.
Jules Arnaud Arsène Claretie.
Henri Meilhac.
Eugène Marie Melchior, Vicomte de Vogué.
Charles Louis de Saulces de Freycinet.
Louis Marie Julien Viaud (Pierre Loti).
Ernest Lavisse.
Paul Challemel-Lacour. (died Oct. 26, 1896).
Vicomte Henri de Bornier.
Paul Louis Thureau-Dangin.
Marie Ferdinand Brunetière.
Albert Sorel.
José Maria de Heredia.
Paul Bourget.
Henry Houssaye.

Jules Lemaitre.
Anatole France.
Costa de Beauregard.
Gaston Bruno Paulin Paris.

One of the first duties of the newly elected academician is to deliver, before the Academy, a eulogy on the academician to whose seat he succeeds. The Academy is the highest authority on all pertaining to the French language, grammar, rhetoric, or poetry, and a chair in its classic precincts is the supreme ambition of every literary Frenchman. See ACADEMY, Vol. I, p. 74-5.

ACADEMIES OF SCIENCE. American learned societies bearing names other than that of "Academy" will be found at SOCIETIES, Vol. XXII, pp. 222–228.

The AMERICAN ACADEMY OF MEDICINE is composed of fellows and honorary members, the former consisting of physicians possessing an A.B. degree from a respectable college, or giving evidence of training equivalent thereto. Honorary members shall not exceed 5 to each 100 fellows, the qualification being the contribution of important matter to medical science, in addition to standing in the profession. The objects of the Academy are to associate physicians who are alumni of academic or scientific colleges; to encourage persons intending to become physicians to pursue a course of study leading to a bachelor degree; to investigate and discuss the various problems of medical sociology. An official paper, the *Bulletin*, is published by the Academy. The membership in 1896 consisted of 18 honorary members and 628 fellows.

The NATIONAL ACADEMY OF SCIENCES is an organization the object of which is to make the knowledge of specialists available for the service of the government. The membership is composed of two classes, those in mathematics and physics and those in natural history. Incorporation, by act of Congress, took place March 3, 1863. When called upon by any department of the government the expense of the investigations, experiments, examinations and reports are paid for from special appropriation. The membership in 1896 was 113, composed of 88 ordinary members, 1 honorary member and 24 foreign associates.

The AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE was formed in 1889 for the purpose of promoting the political and social sciences. Its growth was rapid, the membership in 1896 being 2,500, including residents of every state, as well as 34 foreign countries. Annual meetings are held in January, the yearly fee is $5, and life membership $100.

The AMERICAN ACADEMY OF ARTS AND SCIENCES, of Boston, is second in point of date among the learned societies of the United States. It was incorporated in 1780, with the object of furthering the study of the antiquities and natural history of the country.

The ACADEMY OF NATURAL SCIENCES, of Philadelphia, has one of the largest natural history museums in the world, especially rich in conchology, and a natural history library of 35,000 volumes. It was founded in 1812, and was incorporated in 1817.

The CONNECTICUT ACADEMY OF ARTS AND SCIENCES was incorporated at New Haven in 1799. At first only devoted to matters connected with the state of Connecticut, it now embraces the entire field of science and art.

The NEW YORK ACADEMY OF SCIENCES was incorporated in 1817 under the name of THE LYCEUM OF NATURAL HISTORY, assuming its present title in 1876. The annuals issued by this academy since 1823 have been valuable contributions to the scientific literature of the country.

Baltimore has the *Maryland Academy of Science and Literatare*, founded in 1837; Cleveland, the *Academy of Natural Science*, founded in 1852; Indianapolis, the *Academy of Science;* Madison, the *Wisconsin Academy of Sciences, Arts and Letters*, founded in 1870; Minneapolis, the *Minnesota Academy of Natural Science*, founded in 1873; New Orleans, the *Academy of Science*, founded in 1853; Rochester, the *Academy of Natural Science*, founded in 1881; Topeka, the *Kansas Academy of Science*, founded in 1867.

*Academies of science* were founded in the following named cities at the dates given: San Francisco, 1853; St. Louis, 1856, incorporated 1857; Chicago, 1857, incorporated 1865; Davenport, 1867.

The term *academy* is also applied to those collegiate seminaries in which young men are educated for the army and navy. In the United States there are two of these institutions under governmental control — the Military Academy, located at West Point, New York (see ARMY, Vol. II, p. 619), and the Naval Academy, at Annapolis, Maryland (see NAVY, Vol. XVII, p. 301).

ACAJUTLA, a seaport town of the republic of Salvador, Central America. It lies on the Pacific Ocean, about 40 miles west of San Salvador, the capital city. It was once a large and important town, and during the Spanish control the only port of the state. It is still the second in importance in Salvador, and a considerable export trade in Peruvian balsam is carried on. But the town is extremely dilapidated. Aside from the rude huts of the workmen, there exist only the custom-house, the residence of the officer of the port, and a large, ancient warehouse.

ACANTHACEÆ, a large family of gamopetalous plants; many of which, as the *Thunbergia*, the *Justicia* and the *Aphelandra*, are held in high esteem for the beauty of their flowers. They are known by their opposite leaves, irregular corollas, two or four stamens, and two-celled pods, in which the seeds are borne on hooklike projections.

ACANTHASPIS, fossil fishes found in the limestone of Ohio. They are buckler-headed, and somewhat resemble Cephalaspis.

ACANTHOPHIS, a small, venomous serpent characterized by a horny spine at end of the tail. The death-adder of Australia is a well-known species of this genus.

ACANTHURIDÆ, a family of fishes which are commonly known as lancet-fishes or surgeon-fishes. They are characterized by the presence of sharp spines on the side of the tail. The name signifies thorn-tailed.

ACANTHURUS popularly known as the *Surgeon*,

*Doctor* or *Barber*, is a tropical sea-fish of the *Acanthuridæ*.

A CAPPELLA, a term used, in music, to signify church or chapel style of music. Modern musicians use the expression more usually to signify a vocal composition sung without accompaniment, as was customary with the musical compositions of the primitive church. When an accompaniment is used, the use of the expression signifies that the instruments are intended to play in unison with the voices.

ACARIDÆ OR MITES, a group of minute animals belonging to the family *Acarida*, which is the lowest order of arachnids. The itch-mites (*Sarcoptes*) and the mites living in cheese and flour (*Tyroglyphus*) are typical representatives of the group.

ACARUS. On grounds of priority, the name *Demodex* has been substituted for Acarus. See DEMODEX, in these Supplements.

ACCAD OR AKKAD AND ACCADAI. See BABYLONIA, Vol. III, pp. 184, 185.

ACCA LAURENTIA OR LARENTIA. See ARVAL BROTHERS, Vol. II, p. 671.

ACCELERANDO, a musical term used to signify a gradually increasing velocity of movement.

ACCELERATOR, a term used in the science of ballistics to signify a cannon which has supplementary powder-chambers, the charges of which, exploding in succession after the ignition of the main or primary charge, are intended to accelerate the speed of the projectile. The term is also used, in anatomy, to describe a muscle whose function is to expedite the discharge of urine. The word is also used, in photography, to describe those chemical substances which shorten the time necessary for the development of sensitized plates or paper.

ACCENT. For the accents used on words and syllables, see ACCENT, Vol. I, pp. 80–82 and SPEECH SOUNDS, Vol. XXII, pp. 381–390. In music the term *accent* is employed to denote that the stress or emphasis is to be placed by the performer. The first note inside the bar is always accented, while other accents can be placed where wanted by the use of the sign >. A proper grouping of accents will produce rhythm. Arbitrary accentuation can be placed by the performer in executing the composition.

In mathematics various marks of accentuation are employed, feet and inches being denoted by the use of a single and double accent; as, for instance, 30′ 10″; i. e., 30 feet, 10 inches. Minutes and seconds, in horology, are denoted in a similar manner, as are also the minutes and seconds made use of in trigonometry.

ACCENTOR. See Hedge-Sparrow, under SPARROW, Vol. XXII, p. 369.

ACCEPTANCE, in law, is the receipt of, or acquiescence in, something furnished or some act done in recognition or performance of a contract. A person is said to accept an offer, the service of a notice, a bid, the terms of a contract, rent, or goods delivered, when he performs some act indicating acquiescence. By the common law the oral acceptance of an offer of sale constituted a valid contract of sale. Under a provision in the English statute of frauds (a provision which has been adopted in most of the states of this country) the acceptance must be accompanied by delivery of some part of the goods to create a binding oral contract for the sale of goods. Acceptance of the rent due, or a part thereof, destroys the effect of a notice to vacate premises for default in payment of rent, and is often a waiver of the right to forfeit a lease for other causes. For discussion of acceptance of commercial paper, see Vol. I, p. 82.

ACCEPTANTS OR CONSTITUTIONISTS, the name applied to the Jesuits of France who in 1713 accepted the bull *Unigenitus*, issued by Pope Clement XI. As opposed to them, the Jansenists, Appellants or Recusants rejected the bull and appealed to a general council.

ACCEPTILATION, literally the bearing of a receipt, means, in Roman and Scotch law, the imaginary discharge of a debt or other obligation growing out of a verbal contract, with a declaration that the terms of the contract have been fulfilled when they have not. Hence, by transference to theology, the word is used of the forgiveness of sins by God for the sake of Jesus Christ.

ACCESSORY, in painting, is any part of a picture which is not an essential motive or center of interest, but is introduced for the purpose of enhancing the effectiveness of the main object; thus, for example, the furniture, the drapery, and the ground on which the principal subject is represented, are termed the accessories, and a fault of paying too much attention to them is one of the criticisms often applied to painters.

ACCIDENS OR PER ACCIDENS, an expression signifying not inherent in essence or substance. The object to which a quality *per accidens* is attributed is not affected either by the presence or the absence of that quality, but if it is *per se*, it is not separable from the object. Thus, if we predicate the two qualities, racer and Arabian, the former is separable without at all affecting the horse, being but an accidental quality, or *per accidens*, while the latter is inseparable, being *per se*.

ACCIDENT, IN LAW. An accident, in the strict legal sense, is an injurious happening which occurs unexpectedly in the performance of a lawful act and without negligence on the part of any one other than the person injured. Under such conditions no action, either civil or criminal, can be supported for damages on account of the accident. Generally, when the person who is injured has, through negligence or misconduct, contributed toward causing the accident, he cannot recover damages on account of the injuries sustained unless willful negligence on the part of the defendant contributed to the injury.

Courts of equity have jurisdiction to extend relief in many cases where hardship would arise through accident, as where bonds or notes are destroyed or lost, or have been so defectively executed that they could not be enforced in a court of law. But equity will not relieve a party from the obligations assumed in his contract, which he has undertaken to perform without reserving any conditions, even though performance has become impos-

sible through inevitable accident. Thus where one undertakes to erect a building, and the building is destroyed by fire, without the fault of any one, before it is completed or accepted, he must rebuild before he is entitled to compensation. And, generally, where demised premises are injured or destroyed by fire or accident, the tenant who has covenanted to pay rent will not be relieved therefrom, and if he has by his lease agreed to keep the premises in repair, he must rebuild, after the accidental destruction of the buildings, at his own expense, in addition to paying the stipulated rent. This rule does not apply when the demised premises are only a part of the building, and it has been altered by statute in some states. See ACCIDENT, Vol. I, p. 83.

ACCIDENT OR CASUALTY INSURANCE IN THE UNITED STATES. From the insurance of persons against injuries from casualties and against death from purely accidental causes, which was undertaken as accident insurance originally in this country, as it had been in Great Britain, the business of casualty insurance has come to include not only personal accident insurance, but several other forms of indemnity for loss from happenings which are problematical, both as to the extent of the loss or the time of occurrence, if at all. Accident insurance proper—i. e., the injury or death of persons from accident—first took form, in the United States, at Hartford, Connecticut, in 1863, by the organization of the Travelers Insurance Company, largely to cover the risk of persons traveling by rail and other public conveyances. A year later the company commenced business, and has continued in the field ever since. In 1866 the Railway Passengers' Insurance Company was also formed at Hartford, and did a large business until 1878, when it was consolidated with the Travelers. In 1874 the Hartford Accident Insurance Company was formed, but soon ceased business. All other purely personal accident companies have been organized since the above date, and all of the latter now in existence were organized since 1883. Until within a very few years the accident business has been conducted by joint-stock companies, but since 1881 a large number of companies or associations have appeared and disappeared, formed to do business on the mutual plan. Originally, an entrance or membership fee was charged and an amount fixed as annual dues, all other funds required for the payment of claims being provided by the assessment of members. A good many of the smaller associations still pursue this plan, but the leading mutual associations now usually collect of the insured, upon the issue of the policy, a definite sum, presumably sufficient to carry the risk during the year, reserving the right, however, under the constitution and by-laws, to assess the members, if necessary. Of these associations, there were, at the close of 1895, 52, great and small, ranging in age from 10 and 12 years to a few months. Of this number the bulk of the business on the mutual plan is transacted by less than twenty companies, many of the younger companies, however, showing signs of a rapid growth.

The stock companies transacting accident insurance as applied to persons numbered 13 in 1895, and do the larger portion of the business, or just about double that of the assessment companies. Several of these transact a casualty business, covering the liability of employers for injury by accident to their employees, elevator accidents, breakage of plate glass, accidents to steam-boilers, and loss to employers, individual or corporate, by the dishonesty of their employees. Several companies are in the field which transact exclusively a guaranty or surety business. For a consideration, a government or bank employee, or a man assuming a place of trust and financial responsibility requiring a bond of indemnity of any kind, can secure the necessary bond of a guaranty or surety company. This class of companies does a very large and increasing and generally profitable business. PLATE GLASS INSURANCE has also assumed large proportions, although the number of companies engaged exclusively in plate glass insurance is only five. Two or three other casualty companies, however, do a large plate glass business concurrently with other casualty branches. The business in this country dates back to 1867, when the first plate glass insurance company—the United States Plate Glass—was formed in Philadelphia. A year later a New Jersey company entered the field, and three New York companies were organized later, respectively in 1874, 1876 and 1891. STEAM-BOILER INSURANCE has also assumed large proportions and involves a system of rigid inspection by the insuring company. The business was first transacted in this country, in 1866, by the Hartford Steam Boiler Inspection and Insurance Company, and since that time the business has become a branch of several other companies doing a general casualty business, two companies only being exclusively devoted to steam-boiler insurance.

Of all forms of casualty insurance, that included under the general term of EMPLOYERS' LIABILITY has made the most rapid advance, as, with one exception, it is in this country the most recent. Burglary insurance is the latest form, transacted by three or four companies, one of them only being organized distinctively as a burglary insurance company. The companies writing employers' liability risks include all but three of those transacting a personal accident business, it being closely akin to that form of insurance. The companies engaged in employers' liability insurance also include liability of landlords, of common carriers, public liability and workmen's collective insurance. Two of them also insure against breakage of machinery.

A class of companies has also come into the field during the nine years (1896), some of them quite recently, to insure titles to real estate and guarantee bonds and mortgages, and one company essays to insure against loss from bad debts. In fact, insurance against almost every substantial form of casualty—using that term in its broadest sense seems at present to be provided for in this country.

The growth of accident insurance proper, in the United States, has been wellnigh marvelous, while the other forms of casualty insurance above named have fully kept pace with it. The following summary, by stated periods since 1879, will fully justify our assertion.

ACCIDENT INSURANCE.—STOCK COMPANIES.

| Year. | No. of Cos. | Risks in Force. | Premiums Received. | Losses Paid. |
|---|---|---|---|---|
| 1880 | 2 | $147,621,456 | $1,324,000 | $563,024 |
| 1885 | 5 | 259,747,384 | 2,565,545 | 1,148,708 |
| 1890 | 9 | 666,074,167 | 5,034,162 | 2,184,360 |
| 1895 | 13 | 1,327,459,617 | 6,156,344 | 2,731,892 |

MUTUAL OR ASSESSMENT COMPANIES.—ACCIDENT.

| Year. | No. of Cos. | Risks in Force. | Received from Members. | Paid for Claims. |
|---|---|---|---|---|
| 1880 | No | associations | reporting | in 1880. |
| 1885 | 25 | $250,800,500 | $750,536 | $325,852 |
| 1890 | 28 | 698,442,461 | 2,366,605 | 981,659 |
| 1895 | 52 | 675,598,790 | 2,495,594 | 1,074,715 |

TOTAL ACCIDENT.— STOCK AND MUTUAL.

| Year. | No. of Cos. | Risks in Force. | Premiums Received. | Claims Paid. |
|---|---|---|---|---|
| 1880 | 2 | $147,621,456 | $1,324,000 | $563,024 |
| 1885 | 30 | 510.547,884 | 3,316,081 | 1,474,560 |
| 1890 | 37 | 1,364.516,628 | 7,400,767 | 3,166,019 |
| 1895 | 65 | 2,003,058,407 | 8,651,938 | 3,806,607 |

EMPLOYERS' LIABILITY.

| Year. | No. of Cos. | Risks in Force. | Premiums Received. | Losses Paid. |
|---|---|---|---|---|
| 1890 | 4 | $212,626,780 | $1,015,212 | $437,779 |
| 1895 | 7 | 528,280,585 | 4,002,139 | 2,090,514 |

GUARANTY AND SURETY.

| Year. | No. of Cos. | Risks in Force. | Premiums Received. | Losses Paid. |
|---|---|---|---|---|
| 1885 | 4 | $57,914,934 | $425,249 | $159,323 |
| 1890 | 5 | 163,854,241 | 958,478 | 227,631 |
| 1895 | 10 | 362,188,230 | 1,845,697 | 395,655 |

PLATE GLASS INSURANCE.

| Year. | No. of Cos. | Risks in Force. | Premiums Received. | Losses Paid. |
|---|---|---|---|---|
| 1880 | 4 | $3,554,838 | $109,797 | $37,018 |
| 1885 | 5 | 12,792,886 | 390,438 | 145,381 |
| 1890 | 5 | 28,717 226 | 827,791 | 329 927 |
| 1895 | 7 | 46,363,093 | 1,226.821 | 417,656 |

STEAM-BOILER INSURANCE.

| Year. | No. of Cos. | Risks in Force. | Premiums Received. | Losses Paid. |
|---|---|---|---|---|
| 1880 | 3 | $20,203,215 | $226,003 | $30,256 |
| 1885 | 4 | 54,943.442 | 559,330 | 17,547 |
| 1890 | 5 | 250,260,772 | 1,132,163 | 142,146 |
| 1895 | 5 | 363,103,167 | 1,188,199 | 154,502 |

The entire business above tabulated (assessment accident insurance excepted) for 1895 was transacted by 26 companies, having an aggregate cash capital of $11,729,600. Three of these also transact the business of life insurance in all its branches. Three of the 26 companies are foreign, two being British and one Canadian, the latter transacting exclusively a guaranty business and the two others writing accident, employers' liability and guaranty insurance. Some of the forms of casualty insurance, especially employers' liability in its various forms, have not had a sufficiently extended experience, as to time, to afford an entirely satisfactory basis for rate-making, policy conditions and methods of management generally, but in the spring of the present year (1896) the principal companies succeeded in the formation of a compact, by the terms of which uniform rates are to be charged, based on a combined experience with the several classes of risks, uniform policy contracts used, commissions to agents regulated, and a systematic handling of the business generally adopted. It is believed that safe and satisfactory results will thus be attained. In the evolution of the accident business, as applied to the death or injury of persons, the companies have gradually extended the scope of the promised indemnity, materially liberalized their policy conditions and removed or modified ambiguous clauses, presenting on the whole a very satisfactory contract, and rapidly increasing their business without increasing the loss ratio. In addition to the payment of a stipulated sum for death by accident, specific indemnity is now guaranteed for the loss of one or of both eyes, one or both limbs, or one or both feet, while by the addition of about one fifth to the ordinary premium rate double indemnity is promised for death or disabling injury while riding upon railways and other public lines of travel. Some companies also agree to pay a stipulated weekly benefit for a partially disabling accident, the usual indemnity being for total disability. That the personal accident business has grown since 1879 from less than a hundred and fifty millions of dollars of risks in force to over two thousand millions, with premium receipts augmented from considerably less than one and a half millions to over eight and a half millions of dollars, strikingly shows the trend of the business in the United States. A. H. HULING.

ACCIDENTAL COLORS are visionary complementary colors, seen when the eye is suddenly turned away from a bright-colored object upon which it has been fixed. If we look steadily at a red spot on a white ground, and then turn the eye quickly to another part of the ground, a green spot appears.

ACCIDENTAL LIGHTS, in painting, the real or artificial combinations of light and shade. When a ray of light throws into prominence the principal part of a picture, it is necessary to connect this luminous portion with other parts of the picture by picking out, with delicate touches, the various objects represented in it. These rays of light, illuminating the prominent parts of the picture, produce spots of great brilliancy, which increase the beauty of the objects represented. In landscape-painting, the rays of light coming through masses of foliage are termed accidental.

ACCIPITRES OR RAPTORES, an order of birds, which includes the typical birds of prey. The distinguishing characteristics are the strongly hooked bills, which occur elsewhere only in parrots, and the strong four-toed feet, with three toes in front. Eagles, owls, hawks and vultures are representatives of the order.

ACCOMAC OR DRUMMONDTOWN, the capital town of Accomac County, Virginia, within 3 miles of the Atlantic Ocean, and about 95 miles E. of Richmond. It is the center of a fertile agricultural district and is 2 miles from Tasley station, on a branch oper-

ated by the Pennsylvania railroad. Population 1896, 512.

ACCOMMODATION PAPER. Accommodation paper is commercial paper, such as promissory notes or bills of exchange, drawn, accepted or indorsed, without consideration, for the purpose of lending credit for the benefit and accommodation of another. Contrary to the general rule which applies to commercial paper, an accommodation drawer, acceptor, and the like, cannot avail himself of the defense of a want of consideration, when this class of commercial paper is held by a purchaser for value, even though such purchaser knew that no consideration passed between the parties to the paper. Any other rule would defeat the purpose of this well-established method of lending credit. See ACCOMMODATION, Vol. I, p. 90.

ACCOMPANIMENT, in music, is the aiding of a solo by other parts, which may consist of a whole orchestra or a single instrument, or even subservient vocal parts. It serves to elevate and beautify the solo part, and is subject to certain rules for composition as well as for performance.

ACCOMPLICE. An accomplice is one who is associated with another in the commission of a crime, whether as principal or accessary. The term *accomplice* is frequently applied to one of many, equally concerned in a felony, who is permitted to testify against the others concerned in the crime, and thereby receive a lighter punishment than would otherwise be given. It is not on account of any provisions of the law that an accomplice, who testifies fully and without reserve against those associated with him in the crime, is given a lighter punishment, and in some cases discharged without punishment, but through a judicial custom or practice which has developed for the furtherance of justice.

ACCORD AND SATISFACTION is the substitution of a new agreement between the parties, in satisfaction of the old agreement, and the execution or performance of the new agreement. To constitute a defense to a suit on a contract on the ground of accord and satisfaction, the new agreement substituted must have been fully performed. At common law, accord without satisfaction was not a good defense to a suit upon the original obligation. The payment, by a debtor, of a part of his debt in satisfaction of the entire debt does not constitute a valid satisfaction, even when accepted as such, unless some part of the debt be disputed or contingent, or some other element enters into the transaction which may constitute a valid consideration for the satisfaction. Accord and satisfaction must be by the debtor or his agent, and not by a stranger to the transaction.

ACCOUNT, a statement, written or printed, of whatever is subjected to a commercial reckoning, used especially of such a statement of debits and credits, or of receipts and expenditures. A statement of particulars of an open, running and unsettled business transaction, as between a merchant and his customer, is called an account current. An account which has been adjusted, and in which a balance has been struck, is known as an account stated. The same term is also used of an account which, by implication, is presumed to be correct; as in the case of one party receiving a statement from another and retaining it without objection. Account, in the common law, otherwise known as account render, is an action — now nearly obsolete — lying against one who refuses to render an account which, by virtue of his position or office, ought to have been rendered. Account stated is a form of action by statute in many states. The only issue raised in this action is, whether or not an account has been rendered and accepted by the debtor. The acceptance may be by express admission of its correctness by the debtor, or by implied acquiescence, through his failure to make objection within a reasonable time. When an acceptance is thus established, the correctness of the various items composing the account cannot be called in question except for fraud or mistake. Courts of equity have general jurisdiction in the settlement of involved and disputed accounts, which are too complicated to be determined in a court of law, but equity follows the law in refusing to interfere with accounts stated. See ACCOUNT, Vol. I, p. 91.

ACCRETION, land gradually formed by water deposits along the shore of a river or sea, belonging, except in cases of sudden formation, to property owners adjacent. If the deposit form an island in a stream, it will belong to the owner of the land on whose side of the stream it is formed, but if the island is situated on the center line, the owner on each side of the stream is entitled to that part of the island which is on the side of the line adjacent to his property.

ACCUBATION, the ancient Oriental practice of eating at meals in a reclining posture, though not mentioned by Homer, was in general use in the historic times of Greece and Rome. The guests lay upon the breast or the left side, upon cushioned couches somewhat higher than the table, three sides of which were usually thus occupied, the middle place being considered the position of honor.

ACCUMULATORS OR SECONDARY CELLS. See ELECTRICITY, § 109, in these Supplements.

ACCUMULATION, in law, is the adding to the principal the income or interest of a fund, as provided by will or deed.

ACELDAMA OR AKELDAMA. The name given by the Jews to the field, near the city of Jerusalem, purchased by the chief priests with the thirty pieces of silver for which Judas betrayed Jesus Christ. The "field of blood," as the word means in the original Aramaic, is now shown to travelers on the southern face of the valley of Hinnom and to the southwest of the supposed pool of Siloam. It is also called the "potter's field," and, from its use as a place of interment for friendless strangers, has furnished a synonym now in use in almost every large American city. See Matt. xxvii. 6, 7; Acts i. 19.

ACEPHALOCYSTS, a name sometimes applied to the encysted stage of a certain tapeworm (*Tænia echinococcus*). It was formerly considered an adult parasitic animal. See TAPEWORMS, Vol. XXIII, p. 49.

ACESIUS, a bishop of Constantinople, of the third century. He favored the teaching of Novatianus.

Constantine is said to have exclaimed to him: "Take thee a ladder, Acesius, and go up to heaven alone."

ACETABULUM, a vase used by ancients to hold vinegar or condiments, generally made of fine red clay. Specimens are now in the museum of Naples. In its plural form, *acetabula*, the word was used to denote the ancient Grecian vessels of earth or metal which, clashed together as cymbals, or struck with sticks, gave forth musical sounds. The sucker on the arms of the cuttle-fish, the leg-socket of an insect, and the cavity of the hip-joint in mammalia are each named acetabulum.

ACETAL ($OC^2H^5$), the name of a colorless, ethereal liquid, insoluble in water, and having a peculiarly agreeable odor, similar to that of a hazelnut. It may be obtained by heating alcohol to 160° with aldehyde or by treating monochlorether with sodium ethylate. Acetal was discovered by Liebig. See CHEMISTRY, Vol. V, p. 567.

ACETATES are salts formed by the union of acetic acid with various oxides. They are characterized by solubility in water, and, generally, ready crystallization. They are extensively used in pharmacy and in the manufacture of dyes and paints.

ACETIC ANHYDRID $(C^2H^3O)^2O$, a colorless, odorous fluid, discovered by Gerhardt in 1852, the result of the action of oxychlorid of phosphorus on dry sodium acetate, in proportions of one part of oxychlorid to three of sodium acetate.

ACETIC ETHERS are acetates of alcohol radicals. Common acetic ether, a distillation of sodium acetate, alcohol and oil of vitriol, is a mobile liquid of agreeable taste and smell, used in medicine and in the flavoring of wines.

ACETONE OR PYRO-ACETIC SPIRIT ($C^3H^6O$) is a colorless liquid, which, mixed with water, alcohol or ether, is used to dissolve camphor, resin and fat. It has a biting taste, and its odor, which resembles that of peppermint, is pleasant. Acetone belongs to a class of organic bodies derived from the aldehydes. It is used extensively in the preparation of chloroform.

ACETYL is an organic radical not yet isolated, but is supposed to exist in acetic acid and its derivatives. The formula on this hypothesis is $(C^2H^3O)$ OH. The reason for assuming the existence of this radical in the acetic compounds is, that the formula to which it leads affords the simplest explanation of the most important reactions of acetic acid.

ACETYLENE OR ETHINE GAS. This compound consists of two parts of carbon and two parts of hydrogen ($C^2H^2$). It is a colorless gas that burns with a vividly bright flame, and it has a pungent odor, suggestive of garlic (by which its presence in the air may be detected), and it is very soluble in water. Acetylene gas was first discovered by Sir Humphry Davy, but it was Berthelot who, in 1862, formed it directly from the elements by electrolysis. It can also be made by applications of heat; as by the passing of menthene and carbon dioxid through a red-hot tube, and in other like ways. It is also a product of imperfect combustion. On the facts now named depends the development of its commercial use as an illuminant.

Henri Moissan, a French chemist, in 1894, discovered in one of his electric furnaces a product composed of carbon and lime, or a carbide of calcium, which had surprising reactions when placed in water, both rapidly decomposing and giving forth acetylene gas while throwing down lime, which can again be used to form the calcium carbide. Early in the following year T. O'Connor Sloane invented a device for burning the gas produced, by allowing this new compound to come in contact with water, but a simpler invention by a Frenchman, M. Trouvé, consists of a jar or cylinder, a wire basket and a tight cover through which a pipe passes, terminating in a small ordinary gas-burner controlled by a stop-cock. A piece of calcium carbide, which has the appearance of a grayish stone, is placed in the basket and let down into the jar, which is filled two thirds with water, and the cover screwed on. At once acetylene gas is given off, and as it escapes from the burner it will, when ignited, give a brilliant light.

The economical production of the calcium carbide is due to an American, T. L. Willson, of North Carolina, while trying to form an alloy of calcium. In one of his failures he produced with coke and lime a substance which, on throwing it into water as a waste, he observed to effervesce and rapidly generate a heavy gas having a luminous quality. It was a calcium carbide ($CaC^2$). Further research indicated the practicability of using the process for the production of illuminating gas, and devices for this purpose were patented, and a company formed in New York to reap the commercial fruits of this protection. The success of the company depends on the profitable production of the calcium carbide and the reasonable control of the patent rights, for the apparatus necessary to the use of the gas is perfected to the point of industrial efficiency. Under a pressure of 600 pounds to the square inch, acetylene gas becomes liquefied. In this form the manufacturer delivers the gas to consumers. He puts it up in a tank of pressed steel, 6 inches in diameter by 4½ feet in length, and much resembling the water-tanks used with house ranges or furnaces. At the discharge-pipe there is a reducing-valve through which the gas may pass to the ordinary gas-piping of a building, at a suitable pressure for burning. It is only necessary that the burners should be sufficiently small, say of a half-foot capacity per hour. These tanks contain a supply adequate for three months' use in an ordinary dwelling, and can be replaced by the manufacturer as often as they are exhausted, in a way like that of supplying the soda-fountains of a city with charged reservoirs. Portable lamps for use on bicycles and as headlights, have been experimentally produced.

Commercially, in making carbide of calcium, 1,130 pounds of coal-dust and 1,750 pounds of burnt lime yield about 2,000 pounds of the carbide, with 12 hours' expenditure of 180 electrical horse-power. This short ton will yield, it has been shown, 10,500 cubic feet of acetylene gas, which has an illuminating value of 100,000 cubic feet of ordinary lighting-gas of 22 to 25 candle-power per 5-foot standard burner. The temperature of an acetylene flame, as compared with ordinary coal gas, is as 9 to 14. Per candle-power its heat is one sixth that of coal illu-

minating gas. Its combustion is complete and the carbonic acid resulting, which escapes into the room, is one sixth that of ordinary gas. The calcium carbide is not affected by heat, and only appreciably by the humidity of the atmosphere.

An invention so revolutionary encounters the resistance of companies engaged in the production of other lights, as of ordinary gas and electric lights. It would do away with street-mains, enormous delivery-tanks, gas-meters, wires and other expensive appliances. But great obstacles to its practical development are to be found in the cost of producing the calcium carbide on a commercial scale, the purchase of manufacturing rights by great companies opposed to the development, and the speculative valuation of territorial rights and of royalties.

ACHÆANS AND ACHÆAN LEAGUE. See ACHAIA, Vol. I, p. 93, and GREECE, Vol. XI, p. 107.

ACHÆMENIANS. See PERSIA, Vol. XVIII, p. 565 sqq.

ACHALGANJ, a minor town of British India, in the southern part of the province of Oude, and near the Ganges. Population, 5,000.

ACHENBACH, ANDREAS, a German landscape and marine painter; born in Cassel, Germany, in 1815. He studied art at Düsseldorf and in the principal schools of the Continent. His works have obtained favorable recognition, and many examples are to be found in the private galleries of America. Achenbach obtained a gold medal at the Paris exhibition of 1855, and was in 1864 presented with the cordon of the Legion of Honor.

ACHENBACH, HEINRICH, a German statesman and jurist; born Nov. 23, 1829. In 1858 he became privat-docent, and two years later was appointed professor of German law at the University of Bonn; this position he held for six years, during which time he founded a periodical treating only of mining laws, and published several valuable works on the ancient land relations of the Germans and on German and French mining laws. In 1866 he became connected with the Prussian Diet, and was in the same year made chief councilor in the Prussian ministry of commerce. He spent another six years in this service, after which he was transferred to the ministry of public worship. In 1873 he became minister of commerce, agriculture and public works.

ACHENBACH, OSWALD, a German landscape painter. He was a brother and pupil of Andreas, and was born in Düsseldorf, Feb. 2, 1827. At 36 years of age he accepted the position of professor of painting in the academy of his native place. He has painted much of the Alpine scenery, and his works are favorites and frequent in American galleries.

ACHENE, a dry and hard, one-celled and one-seeded indehiscent fruit, resembling and popularly spoken of as a seed. Examples are found in the head of fruits of the buttercup, the "pits" of strawberries, the plumy fruit of dandelion and thistle-down. Called also Achenium, Akenium or Akene.

ACHERONTIA OR DEATH'S HEAD MOTH. See BUTTERFLIES, Vol. IV, p. 596.

ACHERUSIA, the name of several lakes and swamps in ancient times which were fabled to be connected with the lower or infernal regions. The most noted of these was a lake in Epirus or Thesprotia, through which the river Acheron flowed. Other similarly named lakes were near Hermione in Argolis, in Campania near Cape Misenum, and in Egypt near Memphis. Near Heraclea in Bithynia was a peninsula of this name. Here a deep chasm was said to have been the place where Hercules descended into the infernal regions to bring up Cerberus.

ACHILLEA, a genus of plants of the family of *Compositæ*, having small heads of flowers disposed in corymbs, the receptacle covered with chaffy scales and no pappus. The flowers of the ray are pistillate, and have a short, roundish tongue or lip; the flowers of the disk are perfect, the tube of the corolla flatly compressed and two-winged; the involucre is imbricated. The common yarrow, or milfoil (*A. millefolium*), abounds in some parts of North America and in all parts of Europe. It is a foot or more in height, its leaves bipinnated into very slender and crowded divisions, segments narrow and crowded, and the ray-flowers white or rose-colored.

ACHILLES' TENDON (*tendo Achillis*), the term used by anatomists to denote the tendon attaching the soleus and gastrocnemius muscles of the calf of the leg to the heel-bone. It is capable of resisting a force equal to 1,000 pounds' weight, and yet it is often ruptured by the contraction of these muscles in sudden extension of the foot. Serious wounds and bruises of the *tendo Achillis* were formerly considered fatal. The origin of the term is the myth of Achilles, whose mother, the Nereid Thetis, dipped him in the Styx to insure his invulnerability. All but the heel, whereby she held him, became impervious to the darts of his enemies, and in the heel was he wounded by the treacherous Paris. His death is fabled to have taken place before the Scæan gate at the siege of Troy.

ACHILLI, GIOVANNI GIACINTO, an Italian Protestant translator of the New Testament. Born in Viterbo in 1803, he was educated for the ministry and entered the order of Dominicans. In 1839 he became a convert to Protestantism and issued the version of the New Testament with which his name is generally associated. This has been regarded as the best version in the Italian language. Visiting England on a lecturing tour in 1852, he became involved in a lawsuit with Cardinal Newman, whom he sued for slander. In his later years he was appointed Italian professor in the English college at Malta.

ACHIMENES, a plant of the natural order *Gesneraceæ*. See HORTICULTURE, Vol. XII, p. 265.

ACHOR. One of the forms of pustules occurring on the faces of children suffering from *impetigo contagiosa*. The pustules are very small, but have extensive and severely inflamed bases. They become covered with crusts of a yellow color, resembling dried honey in appearance. This species of skin disease is most frequently met with in childhood, resulting from improper food and want of cleanliness and attention. Poulticing and the application of white precipitate ointment will remove the external symptoms, if used in conjunction with aperient medicines to regulate the health.

ACHROMATIN. See PROTOZOA, Vol. XIX, pp. 832, 833.

ACHROMATISM. See LIGHT, Vol. XIV, p. 601.

ACHTKARSPELEN, meaning the "eight parishes," is a commune in the province of Friesland, Netherlands. It contained in 1891 a population of 9,250 inhabitants.

ACHTYSKA, same as AKHTYRKA, Vol. I, p. 436. Population 1883, 23,892.

ACIDIMETER OR ACIDOMETER, an instrument for determining the real strength of hydrated acids. The most usual form of this instrument is a glass tube graduated into a hundred equal parts, into which an alkaline liquor, the strength of which has been determined, is placed. The acid to be tested is of known quantity, and its strength is ascertained by the proportion of liquor necessary for its saturation.

ACKERMANN, RUDOLPH, the father of English lithography, was born at Schneeburg, in Saxony, April 20, 1764. He removed to London in 1795, and opened a repository of fine arts in the Strand, which was very successful. He introduced the art of lithography into England, and was the originator of the "Annuals," which he commenced by his *Forget-me-not*, published in 1823 and after. He did much to promote wood-engraving, the art of waterproofing and the introduction of gaslight into shops. He died March 30, 1834.

ACKLEY, a town and railroad junction in the extreme N.E. portion of Hardin County, Iowa, near Beaver Creek, about 132 miles W. of Dubuque. The Illinois Central and the Iowa Central railroads cross each other here. There is a convent of the Sisters of Mercy in Ackley, and a foundry, machine-shop and flour-mill. Population 1895, 1,458.

ACKNOWLEDGMENT is the act of one who has executed a deed or other instrument in going before a proper officer and declaring that the instrument so executed is his own act and deed. The term is also applied to the certificate of the officer before whom such declaration was made. If the acknowledgment is regular on its face, the instrument is admissible as evidence without further proof, and is in condition to be recorded. The usual officers before whom acknowledgments are taken are judges of courts of record, justices of the peace or notaries public. In some states a deed is void without acknowledgment, except between the parties thereto, and subsequent purchasers without actual notice.

ACLAND, ARTHUR HERBERT DYKE, an English member of Parliament. Born in 1847, he was educated for the church, was ordained, and for some time was a prominent figure in Oxford University life. Leaving the church, he was for a time the principal of the Oxford Military School. In 1885 he entered Parliament for the Rotherham division of Yorkshire, which constituency he has continued to represent as a Gladstonian Liberal. He has been very active in promoting the cause of technical education, and in 1892 served as president of the council of education. He has published a *Handbook Political History of England*, and *Workingmen Co-operators*.

ACLAND, CHRISTINA HENRIETTA CAROLINE FOX, daughter of the first earl of Ilchester; born Jan. 3, 1750. She married, 1770, Major John Dyke Acland, accompanied him to America, and shared in all the vicissitudes of Burgoyne's campaign. When her husband was wounded and taken prisoner in the second battle of Saratoga, she followed him, and was received with the utmost cordiality by General Gates. For some time before her death at Tetton, Somersetshire, England, July 21, 1815, her adventures furnished a favorite subject for pen and pencil.

ACLAND, SIR HENRY WENTWORTH, BART., was born in 1815, and educated at the University at Oxford, where, after making a study of medicine for some years, he took the degree of M.D. in 1848. In 1858 he became a regius professor there. The university museum was founded partly through his efforts. Sir Henry Acland accompanied the Prince of Wales on his tour through America in 1860. He published *The Plains of Troy*, while still a student at college, and 15 years later he gave to the public a work entitled *Memoir on the Visitation of Cholera in Oxford, 1854*. He was also the author of a number of scientific and medical papers.

ACLAND, SIR THOMAS DYKE, an English statesman, father of Arthur Herbert Dyke Acland; born at Killerton, Devonshire, May 25, 1809. He was a companion of W. E. Gladstone at the University of Oxford, proceeding to Parliament as member for West Somersetshire in the Conservative interest. He sat for this same constituency for 10 years, supporting the repeal of the Corn Laws, and evincing deep interest in agricultural questions. He was largely instrumental in organizing the volunteer force of his native county. He changed his polities in 1865, and entered the House of Commons as a follower of Mr. Gladstone. He was defeated at the election in 1886 and retired to private life.

ACLIDE was a weapon in use among the early Romans. Called also aclis. It could be used as a missile or as a club.

ACLINIC LINE is the name for the magnetic equator, which cuts the terrestrial equator, inasmuch as on the former line the magnetic needle has no dip, but lies horizontal. The aclinic line is irregular and also variable.

ACNE. See SKIN DISEASES, Vol. XXII, p. 121.

ACOMA, a pueblo or Indian village situated on a high plateau or mesa in Valencia County, New Mexico, about 14 miles S. of Cubero station on the Atlantic and Pacific railroad, and 55 miles S.W. of Albuquerque. A winding pathway cut in the side of the sandstone rock of the plateau is the only method of access to the summit of the mesa. The Spanish explorer Coronado visited Acoma as early as September, 1540.

ACONCAGUA, the loftiest peak of the Andes. It is an extinct volcano, and reaches an altitude of 23,900 feet, being situated about 100 miles E.N.E. of Valparaiso. The mountain gives its name to a Chilian province. See ACONCAGUA, Vol. I, p. 98.

ACONITIA, organs of anemones. See CORALS, Vol. VI, p. 371.

ACONITIN ($C^{37}H^{40}NO^{10}$), the active principle or base of the *Aconitum Napellus*, or monk's-hood,

also called *aconitia*. See Vol. I, p. 98. It occurs as a white powder, or as tabular and colorless crystals. It is slightly soluble in water, but dissolves freely in alcohol. Aconitin is one of the most fatal poisons, its detection, on account of the infinitesimal dose necessary to cause death, being extremely difficult. Its taste is bitter and acrid.

ACORN SHELLS OR BARNACLES. Names applied to the *Balanidæ*, the most numerous cirripeds both in species and in individuals. *Balanus*, the best-known genus of the northern seas, is found incrusting rocks and piles between tide-marks. A species in South America reaches a height of nine inches, and is considered by the natives a delicious article of food. See CRUSTACEA, Vol. VI, p. 665.

ACOUSTIC TELEPHONE. See MECHANICAL TELEPHONE, Vol. XXIII, p. 127.

ACQUAVIVA DELLE FONTI is a southern Italian town, situated at the base of the Apennines, in the province of Bari, 16 miles S. of the town of Bari. It has a station on the Bari and Taranto railroad, and contains several buildings of note, a parish church, two hospitals and several convents, and is surrounded by walls and ditches originally built as a defense to the city. The climate is agreeable. Population, 7,986.

ACQUIESCENCE, in law, is such consent to any matter as may be reasonably inferred from neglect to take legal proceedings in opposition thereto.

ACQUITTAL is a discharge or release from an obligation. In criminal law it means a judicial discharge from an accusation or charge made against one by indictment or otherwise. Acquittal in fact is such as takes place when a jury, after hearing the evidence in a criminal proceeding, finds a verdict of not guilty. Acquittal in law means such acquittal as results from the operation of law without a trial, as where one is charged as accessary, and the principal is found not guilty, thus discharging the indictment. An acquittal is a bar to any further prosecution for the same offense, or any part thereof which was involved in the former trial.

ACRASPEDA, a group of jelly-fishes, or *medusæ*, which develop directly from the egg, and are not budded from a hydroid stem, as in the *Hydromedusæ*. No velum is present, and for this reason they were termed *Acraspeda* Some authors have used the equivalent term *Discophora*, but later zoölogists have applied the term *Scyphomedusæ* to the class.

ACRELIUS, ISRAEL, a Swedish clergyman, the historian of his compatriots' settlements in America. He was born in Osteraker, Dec. 25, 1714; graduated at the University of Upsala. In 1749 he emigrated to America, and took pastoral charge of the Swedish settlements on the Delaware. His history of these plantations was published in Stockholm in 1759. He died at Fellingsbro, Sweden, April 25, 1800.

ACRI, a town in the province of Cosenza, compartimento of Calabria, in southern Italy. It is 13 miles N.E. of the town of Cosenza, on an affluent of the river Crati, and in a fertile and salubrious region. Population 1881, 3,944.

ACROBATES OR ACROBATA. See PHALANGER, Vol. XVIII, p. 727.

ACRO-CORINTHUS, a solitary and steep mountain, 1,900 feet high, rising from the plain on the Isthmus of Corinth, Greece. It served as the citadel of the city proper, which was on its northern slopes. It was the strongest natural citadel in Greece, and is to the present time the site of a fortification. Here, too, stood the far-famed temple of Venus. Of its pristine glories but seven Doric columns remain. Extensive archæological excavations have been made on its slopes under the auspices of various learned societies.

ACROLEIN OR ACRYLIC ALDEHYDE ($C_3H_4O$), a strongly refracting and liquid acid, colorless and limpid, of less specific gravity than water. It constitutes the acrid principle produced by the distillation of glycerin or its compounds and fatty bodies. It is a product of the dehydration of the glycerin. In the state of vapor, while in process of distillation, it is extremely irritating to the eyes and respiratory organs, to which property it owes its name. The pungency of the odor exhaled by a newly extinguished candle-wick is due to the presence of a minute quantity of this acid.

ACROMYODI, a sub-order of passerine birds, embracing the *Oscines*, or singing-birds.

ACROTERIUM. See ARCHITECTURE, Vol. II, p. 459.

ACS, a village of Hungary, in the district of Komorn, about six miles S.W. of the town of Komorn. Situated on the right bank of the Danube, it has a noted palace, and was the scene of several encounters between the Austrians and Hungarians in the war of 1849. Population, 3,963.

ACT. In a legal sense, this word is used to signify a law, judgment, decree, edict, or something done by an individual or by a body of men. Acts are spoken of as intentional or unintentional; as malicious, wanton and criminal; as reasonable; as of diligence, of negligence, fraud or trespass. When a bill is passed by a legislative body, it becomes an act of that body. Act of God, as a legal term, is an inevitable happening which results from natural causes, and which could not have been prevented by any artificial means or human care, such as lightning, tempests, floods or earthquakes. When a contract becomes impossible of performance by the act of God, the parties are excused thereby; and if the law casts a duty upon a man which the act of God prevents him from performing, he is excused. But the destruction of a building by fire is not by act of God, unless the fire is caused by lightning or some other superhuman agency. A loss caused by the great fire in Chicago was held not to be caused by the act of God. See ACT, Vol. I, p. 122.

ACTA ERUDITORUM, the first literary journal of Germany. See PERIODICALS, Vol. XVIII, p. 540.

ACTA MARTYRUM ET SANCTORUM. See BOLLANDIST FATHERS, Vol. IV, p. 18.

ACTINIDÆ. See ACTINOZOA, Vol. I, p. 130.

ACTINOMORPHOUS, a term usually applied to the regular flower of the older botanists; that is, a flower whose parts are equally repeated about the center, on the radial plan. As the flower may be divided into similar halves in several vertical plants, it is also spoken of as polysymmetrical.

ACTINOMYCOSIS. See PARASITISM, Vol.

XVIII, p. 270; VETERINARY SCIENCE, Vol. XXIV, p. 204.

ACTION, in *law*, is a proceeding instituted in court by one or more persons against another, or others, to secure the punishment or redress of a wrong, or the enforcement of a right; distinguished from judicial proceedings which are non-controversial in form, as the probate of a will. In a wide sense of the term, an action may be classed as either civil or criminal. An action instituted by the sovereign power for the punishment of crime is criminal; but if instituted by the sovereign power in the capacity of owner or contracting party, or by a subject or citizen, it is civil. The term *indictment*, frequently applied to a criminal action, is properly used only of one kind of formal complaint, by which such a proceeding may be presented for trial. A common-law action is classed as real, personal or mixed; real, when the claim made is title to real estate; personal, when it demands a chattel, damages for an injury, a debt, or a statutory penalty; and mixed, when it demands both real estate and damages for a wrong. In a legal sense, action, cause, proceeding and suit, are interchangeable terms, and refer to equity as well as to law. The chief classification of civil actions are: actions *ex contractu*, or those based upon contractual relations; and actions *ex delicto*, or those founded upon a tort, and which are brought for the purpose of obtaining satisfaction for damage caused by a wrongful act. Right of action is the right to institute a suit under circumstances which will permit a recovery. See ACTION, Vol. I, p. 132.

ACT OF CONGRESS. See CONGRESS, in these Supplements.

ACTON. A township in Middlesex County, in the northeast part of the state of Massachusetts. It includes the villages of South and West Acton, is traversed by the Boston and Maine and the New York, New Haven and Hartford railroads, and is drained by the Assabet River. There are some manufactures, such as clothing, flour, etc. Population (1895), 1,978.

ACTON, JOHN EMERICH EDWARD DALBERG, LORD, an English stateman; born in Naples, Italy, Jan. 10, 1834. Lord Acton is a leader of the English Catholic party, and was elected to Parliament in 1859 as member for Carlow, Ireland. He was raised to the peerage in 1869, and was noted for his conspicuous hostility to the doctrine of Papal infallibility at the Œcumenical Council at Rome in that year. Lord Acton founded the *Home and Foreign Review* and edited the *Weekly Review* and the *North British Review*. He was, in 1887, given the honorary degree of D.C.L. by the University of Oxford.

ACTON BURNELL, a parish in Shropshire, England, eight miles S. of Shrewsbury. At the castle here, now in ruins, Edward I held, October 12, 1283, a national council of the three estates of the realm. This council, while the forerunner of the present parliamentary system, enacted the Statute of Acton Burnell, sometimes called the Statute of Merchants. By the terms of this statute a creditor by bond of record obtained a summary process for the recovery of his debt. Population, 372. See STATUTE MERCHANT, Vol. XXII, p. 471.

ADA, a township, the county seat of Norman County, in the northwest portion of Minnesota, about 30 miles N. of Glyndon. It is a station on the Great Northern railroad. A large creamery is in operation here. Population 1895, 845.

ADA, a village of Liberty township, Hardin County, in the northwest-central part of Ohio, 15 miles E. of Lima. It is a station on the Pennsylvania railroad. It is the site of the Northwestern Ohio Normal School, founded in 1870. Its manufactures are flour, lumber, flax, sash, doors, etc. Population 1890, 2,079.

ADA, a steamboat station on the navigable river Theiss, in the southern portion of Hungary. It is situated about 60 miles N. and above the confluence of the Theiss and the Danube. Population 1895, 9,697.

ADAGIO, a term in music, used to signify a slow or leisurely measure of time. In the more complicated and classic compositions of orchestral or chamber music, the second or third movement is usually marked *adagio*, serving as a contrast to the rapid and energetic movements of the parts of the sonata or symphony which follow or precede it. The chief use of the *adagio* is its capacity of expression, affording, as it does, to the composer the most favorable method of expressing his individuality of feeling. Some of the finest specimens of the use of the *adagio* are to be found in the sonatas and symphonies of the old masters, especially Beethoven. The modern school of composers has had greater success in *andante* movements.

ADAIR, JAMES, an Indian trader of English birth who resided for 40 years among the Chickasaw and Cherokee Indians, or from 1735 to 1775, studying their dialects and attempting to trace their origin. In 1775 he published a *History of the American Indians*, in which he endeavored to establish the identity of the Indians with the descendants of the lost Ten Tribes of Israel. The most valuable part of his history is in the vocabularies and comparisons of Indian dialects.

ADAIR, JOHN, American general, born in Chester County, South Carolina, in 1759. He served in the Revolutionary War, and took part in the Indian war as a major of militia, under St. Clair and Wilkinson, in 1791. He was defeated by Little Turtle, the Miami chief, Nov. 6, 1792, at Fort St. Clair, Ohio, and forced to retreat. He commanded the Kentucky militia at the battle of New Orleans, and later was representative from Mercer County in the Kentucky legislature, registrar of the United States land-office, and United States Senator. In 1820 he was elected governor of Kentucky, and in 1831 a member of Congress. He died in Harrodsburg, Kentucky, May 19, 1840.

ADALIA OR ANDALIYEH. Same as SATALI, Vol. XXI, p. 317.

ADAM, ADOLPHE CHARLES, a French musical composer; born in Paris, July 24, 1803. He was professor of composition in the Paris Conservatoire, and also contributed to the newspapers. He was successful in comic operas, of which the chief, *Le Pos-*

*tillon de Longjumeau*, produced in 1835, is still popular. He died in Paris, May 3, 1856.

ADAM, GRAEME MERCER, editor and author, was born May 25, 1839, near Edinburgh, Scotland; educated at Portobello and Edinburgh; came to Toronto, Canada, in 1858, as a publisher of books; in 1878 devoted himself to literature; founded the *Canada Educational Monthly;* editor (1880) of *Canadian Monthly*, which, with Goldwin Smith, he founded eight years earlier; was in New York for some time as a publisher's editor in 1876 and 1883; in 1892 made that city his residence; in 1896 removed to Chicago and became editor of the *Self Culture* magazine; served as major of militia in repelling the Fenian invasion of Ontario in 1866; author or reviser of text-books on history and language; of Justin McCarthy's *History of Our Own Times;* of *Scenic America*, and *People's History of the United States;* author of a history of the *Canadian Northwest; Life of Sir John A. Macdonald; Precis of the History of England;* with Miss Wetherald, of *An Algonquin Maiden*, a romance of early Canada; a *History of Canadian Literature*, and of a score of minor publications.

ADAM, JEAN, a Scottish poetess; born near Greenock in 1710, and died in the poorhouse at Glasgow in 1765. Her *Poems* (1734) were of a religious character, and in the Tate and Brady strain. The authorship of *There's Nae Luck Aboot the House* is ascribed to her, but more probably it was written by Mickle.

ADAM, LAMBERT SEGISBERT, was a noted sculptor; born at Nancy, France, in 1700; died, in 1759. Fourteen years before his death he became professor in the Paris Royal Academy, and the garden of Versailles now contains some of his best statuary. NICHOLAS SEBASTIEN, brother of Lambert, born at Nancy, 1705, died 1778, was also a master in the art. One of his productions is entitled *Prometheus Bound.*

ADAMANT, a term now used to signify any substance of exceptional hardness. The use is more in a figurative and poetical sense than in actuality. Among the ancients the term was used to describe a mythical stone of marvelous hardness, which, as the fable grew, was also endued with magnetic properties. Theophrastus called the emery-stone of Naxos, in his day the hardest known substance, by this name. Corundum is now but rarely called adamant.

ADAMS. The name of a village in Adams township, Berkshire County, in the northwest part of the state of Massachusetts, 47 miles from Springfield. It is on the Pittsfield branch of the Boston and Albany railroad, in the midst of the sylvan beauties of the Berkshire hills. Near the village, Mount Greylock, the highest point in the state, rises to an altitude of 3,600 feet. The district is drained by the Hoosac River, and supplied with water-power from its rapid stream. The chief industry is the manufacture of textile fabrics. Population 1890, 9,213.

ADAMS, a town in Jefferson County, in the northern portion of New York state, is situated 156 miles W.N.W. of Albany, and 40 miles N.E. of Oswego. It is a manufacturing town, containing tanneries and carriage manufactories, also a foundry, a malthouse, a sash and blind factory, and a cabinet-shop. The Hungerford Collegiate Institute has its seat here. Population 1890, 3,181.

ADAMS, ABIGAIL SMITH, the wife of President John Adams, and mother of John Quincy Adams, was the daughter of Rev. William Smith, of Weymouth, Massachusetts, where she was born, Nov. 23, 1744. By her mother, also, she was of sturdy Puritan stock. Her childhood and youth, owing to a delicate physical constitution, gave little promise of the remarkable woman that she was destined to become. In 1764 she married John Adams; and in 1784–85 accompanied her husband to France and England. In London, as the wife of the minister of the United States, at a period when the loss of the colonies still rankled in the minds of the Tories, she experienced with patient dignity thinly veiled hostility and open sneers. Returning to the United States, she resided with her husband at the seat of government for twelve years, whence she returned to Braintree. Her letters, published by her grandson, Charles Francis Adams, in 1840, contain a graphic portrayal of eighteenth century manners. She died at Quincy, Massachusetts, Oct. 28, 1818.



ABIGAIL SMITH ADAMS.

ADAMS, ALVIN, founder of the Adams Express Company, born at Andover, Vermont, June 6, 1804. Shortly after the first United States express route was started between New York and Boston by William Harnden, Mr. Adams withdrew from the produce business, into which he had entered at Boston, about 1837, and started an opposition route. After spending three years alone in this business, he was joined by Ephraim Farnsworth. The business rapidly increased, and extended over a large tract of the Union. The California express was started in 1850, and in that year the firm name was changed to Adams Express Company. Mr. Adams died in Watertown, Massachusetts, Sept. 7, 1877.

ADAMS, CHARLES BAKER, an American naturalist and geologist, was born at Dorchester, Massachusetts, Jan. 11, 1814. He graduated at Amherst College in 1834, and then studied theology for two years at Andover, Massachusetts. From 1838 to 1847 he was professor of chemistry and natural history in Middlebury College; at the time of his death he was professor of zoölogy and astronomy at Amherst College, which office he had filled for six years. He died in St. Thomas, Danish West Indies, Jan. 19, 1853.

ADAMS, CHARLES FOLLEN, an American humorous versifier, was born at Dorchester, Massachusetts, April 21, 1842. While serving in the Thirteenth Massachusetts Infantry in the Civil War, he was wounded and taken prisoner at Gettysburg. He published *Leedle Yawcob Strauss and Other Poems* (1878). He contributed much humorous dialect verse to periodicals.

ADAMS, CHARLES FRANCIS, an American statesman, author and diplomatist, son of President John Quincy Adams and grandson of President John Adams, was born in Boston, Ang. 18, 1807. At two he was taken abroad and spent his early years in Russia and England, where his father was United States minister, and graduated at Harvard in 1825. He studied law in the office of Daniel Webster, and was admitted to the bar in 1828. From 1831 to 1836 Mr. Adams served in the Massachusetts legislature as a Whig, but after this he adopted the tenets of the Free-Soil party. In 1848 this party, in convention at Buffalo, nominated Mr. Adams for Vice-President of the United States, with Martin Van Buren for President, but both failed of election. In 1858 Mr. Adams was elected to Congress from the third district of Massachusetts as a Republican, and in 1860 he was re-elected. In 1861, he was sent as minister to England, where he remained seven years. His duties at this period were more onerous than those of his father in the same office half a century before. The *Trent* affair and the *Alabama* question were among those he had to face, and his firmness and self-control in those trying times were admirably displayed. In 1872 the liberal Republicans considered his name as a candidate for the Presidency, but the barren honor fell to Horace Greeley. He was an arbitrator of the *Alabama* claims, 1871–72, and was president of the board of overseers of Harvard College for several years. Mr. Adams has an equal claim to the gratitude of his country for the memoirs of his illustrious parents and grandparents, edited by him from 1850–1877. He died in Boston, Nov. 21, 1886.



CHARLES FRANCIS ADAMS.

ADAMS, CHARLES FRANCIS, JR., second son of Charles Francis Adams, was born in Boston, May 27, 1835; graduated at Harvard in 1856, and was admitted to the bar in 1858. He entered the volunteer service at the beginning of the war and was mustered out in July, 1868, as brevet brigadier-general of volunteers. In 1869 he was appointed on the board of railroad commissioners for Massachusetts, and in 1884 became president of the Union Pacific railway. He has published *Chapters of Erie, and Other Essays*, and a volume dealing with railroad accidents and their causes. In 1882 he was made a member of the board of overseers of Harvard University.

ADAMS, CHARLES KENDALL, was born at Derby, Vermont, Jan. 24, 1835, and was educated at the University of Michigan at Ann Arbor, where he graduated in 1861. He served for many years as professor of history in that institution, and in 1881 obtained a like position at Cornell University, Ithaca, New York. In 1885 he became president of that university. This position he resigned in May, 1892, and became president of the Wisconsin University at Madison. Among his works are a *Manual of Historical Literature; Democracy and Monarchy in France*, and other aids to study.

ADAMS, DANIEL, M.D., an American educational author, was born at Townsend, Massachusetts, Sept. 29, 1773; was a graduate at Dartmouth, 1797. He took an active interest in the political affairs of New Hampshire; was well known as an editor and physician, and also became popular as an educator; he published a number of school books, among which was a useful textbook on arithmetic. He died at Keene, New Hampshire, June 8, 1864.

ADAMS, EDWIN, an American light comedian; born at Medford, Massachusetts, Feb. 3, 1834. His first success on the stage was at the National Theatre in Boston, in the part of Stephen in Sheridan Knowles's *Hunchback*. Most of his engagements were in the East, among others his appearance as Mercutio at the opening of Booth's Theatre. His favorite and most successful roles were the characters of Iago, Claude Melnotte and Enoch Arden. Mr. Adams appeared in Shakespearean roles with Edwin Booth in 1869–70, visited Australia, and soon after retired on account of ill health. He died in Philadelphia, Oct. 25, 1877.

ADAMS, GEORGE EVERETT, American Congressman, born at Keene, New Hampshire, June 18, 1840. He graduated at Harvard in 1860; studied at the Dane Law School, Cambridge, Massachusetts, and then practiced. He was elected to the Illinois state senate in 1880. Two years later he became a member of the Forty-eighth Congress, and was re-elected for the three succeeding terms.

ADAMS, HANNAH, an American authoress; born at Medfield, Massachusetts, in 1755. She was probably the first woman in America who took to authorship as a means of livelihood. Her pen was fertile in religious and historic works, of which *A View of Religious Opinions* (1784) is the one with which her name is more generally associated at the present day. Simple to a degree in habits, and circumscribed as her travels were to points within a radius of 10 miles of her native village, she yet made many friends. She died at Brookline, Massachusetts, Nov. 15, 1832, and hers was the first body interred in Mount Auburn cemetery.

ADAMS, HENRY, an American political essayist, third son of Charles Francis Adams; born in Boston, Massachusetts, Feb. 16, 1838; graduated at Harvard, and as private secretary accompanied his father's mission to England in 1861. On his return, and for several years, he was an instructor at Harvard, From 1870 to 1876 he edited *The North American Review*. He is the author of numerous books and essays, among which are *Historical Essays* (1871); *Life of Albert Gallatin* (1879); and *A History of the United States*, 9 vols., (1891).

ADAMS, HERBERT BAXTER, an American historian and educator; born at Amherst, Massachusetts, April 16, 1850; educated at Amherst and Heidelberg; appointed, in 1876, fellow of history at Johns Hopkins University, he was successively associate in history, associate professor and university professor. He became historical lecturer at Smith College, Northampton, Massachusetts, in 1878, and at Chau-

tauqua in 1888. He assisted in founding the American Historical Association and became its first secretary. Mr. Adams's works constitute valuable historical contributions to the literature of his country. Among them may be mentioned *The College of William and Mary; Maryland's Influence in Founding a National Commonwealth; Thomas Jefferson and the University of Virginia;* and *The Study of History in American Colleges and Universities.*

ADAMS, ISAAC, an American inventor; born in Rochester, New Hampshire, in 1803. He commenced work as a factory operative at an early age, and in 1824 went to Boston in search of work. In 1828 he invented the improved printing-press with which his name is associated. Its introduction into general use operated as a revolution in the art of typography, and so thoroughly as to cause a demand for thirty different sizes of the press. He retired from business, assured of a handsome fortune from his labors, and served as a senator in the Massachusetts legislature in 1840. He died at Sandwich, New Hampshire, July 19, 1883.

ADAMS, JASPER. An American educator; born at Medway, Massachusetts, Aug. 27, 1793. He graduated at Brown University and afterward took a course in theology at Andover. Returning to his *alma mater* as professor of mathematics in 1819, he devoted his entire life to the instruction of youth. In 1824 he was chosen president of Charleston College, South Carolina, and was called to a similar position at Hobart College, New York, in 1826. He returned to the South in 1828, and for eight years, and for the second time, was president at Charleston. In 1838 he was appointed chaplain, and professor of history, ethics and geography, at the United States Military Academy at West Point. Again returning to the South, he was the head of an academy at Pendleton until his death at Charleston, Oct. 25, 1841. His *Elements of Moral Philosophy* has been largely used in colleges and higher institutions of learning.

ADAMS, JOHN, an American educator; born at Canterbury, Connecticut, Sept. 18, 1772. He graduated at Yale College in 1795. He presided for a time over Plainfield Academy and Bacon Academy in Colchester, Connecticut, becoming principal of Phillips Academy, Andover, Massachusetts, in 1810. In this position he was very successful until the time of his resignation in 1833. Removing to Illinois, he was active in establishing many Sunday schools. Yale recognized his services with the honorary degree of LL.D. in 1854. He died at Jacksonville, Illinois, April 24, 1863.

ADAMS, JOHN COUCH, an English astronomer, the discoverer, simultaneously with Leverrier, of the planet Neptune, was born at Lidcot, near Launceston, in Cornwall, England, June 5, 1819. He was educated at St. John's College, Cambridge, where, in 1843, he attained the honor of senior wrangler, was elected a fellow, and became a mathematical tutor. Soon after taking his degree he undertook to find out the cause of the irregularities in the motion of Uranus, anticipating, indeed, his own and Leverrier's discovery, that they were due to the influence of a planet unknown at that time. Leverrier did not commence his researches till the summer of 1845, but on the 10th of November he published the results of his calculations, assigning to the unknown planet almost the same place that Adams had in an unpublished paper which he left with the astronomer royal at Greenwich Observatory the previous October. Leverrier thus acquired a larger share in the honor of the discovery, but the merit of Adams is none the less, and the council of the Royal Astronomical Society awarded equal honors to both in 1848. Neptune was actually observed near the place assigned, by Galle, at Berlin, in September, 1846. In 1858 Adams was appointed to the chair of mathematics in St. Andrews, which, however, he vacated within a few months, on being nominated to the Lowndean professorship of astronomy, Cambridge. He made important researches on the secular acceleration of the moon's mean motion, and on the theory of the November meteors. He died at Cambridge, Jan. 21, 1892.

ADAMS, JOHN QUINCY, an American politician and municipal reformer; the eldest son of Charles Francis Adams; born Sept. 22, 1833. After graduating at Harvard he entered the legal profession in his native state of Massachusetts. He served in the legislature, and was defeated as the nominee of the Democratic party for governor in 1871. He has devoted many years to the study of problems of municipal reform. Died Aug. 14, 1894.

ADAMS, JOHN R., was born in Plainfield, Connecticut, in 1802, and graduated from Yale College in 1821. He taught in Phillips Academy, Andover, Massachusetts, for three years, and subsequently became pastor of various Congregational churches of New York, Massachusetts and Maine. During the Civil War he rendered valuable services to the Union soldiery as chaplain of the Fifth Maine and One Hundred and Twenty-First New York regiments. Died at Northampton, Massachusetts, April 26, 1866.

ADAMS, JULIUS WALKER, an American soldier and engineer; born in Boston, Oct. 18, 1812; educated at the United States Military Academy. Entering the profession of a civil engineer after his graduation, Colonel Adams became an assistant in the engineer's department of the Providence and Stonington railroad; subsequently obtained promotion and superintended the construction of several and most important enterprises. Among these were the United States dry-dock, the Brooklyn navy-yard, the New York and Erie railroad; the Brooklyn system of sewerage, and the New Haven water-works. When Sumter was fired on Mr. Adams's early military training brought him to the front as the colonel of the Sixty-seventh New York Volunteers; he served with distinction, and was severely wounded at the battle of Fair Oaks. With the surrender of Lee's army Colonel Adams resumed his engineering labors. For many years he was the chief engineer of the city of Brooklyn and consulting-engineer to the public works department of the city of New York. He is a member of the New York Academy of Science.

ADAMS, NEHEMIAH, a Congregational clergyman and theologian; born at Salem, Massachusetts, Feb. 19, 1806; graduated at Harvard and

Andover Seminary. He began his ministry in the First Church of Cambridge, and in 1834 became pastor of the Essex Street Church, Boston, a relation terminating only with his life. He was a prominent figure in the theological controversies of his time, and was an ardent advocate of slavery in the South. His book, *South Side View of Slavery* (1854), provoked intense discussion and condemnation from the anti-slavery element, as did also his later volume, *A Sable Cloud* (1863). Among his other books are *The Cross in the Cell; Scriptural Argument for Endless Punishment; Life of John Eliot.* He was a man of eloquence and scholarly attainments. Died in Boston, Oct. 6, 1878.

ADAMS, SAMUEL, an American military surgeon, was born in Maine. He was distinguished for bravery and efficiency in hospital and field service during the Civil War, and rose to be medical inspector of the Ninth Corps. One notable instance of his intrepidity was his dressing the wounds of General Porter while under severe fire. He died of yellow fever in Galveston, Texas, Sept. 9, 1867, while endeavoring to stay the ravages of an epidemic there.

ADAMS, SETH, an American inventor and manufacturer; born in Rochester, New Hampshire, April 13, 1807. After an apprenticeship in a cabinet-maker's store, he proceeded to Boston and worked in a machine-shop. This training was of material assistance to him when, a few years later, he established himself in the business of manufacturing machinery, and in 1833, when he co-operated with his brother Isaac in improving and manufacturing the latter's newly invented printing-press. Increasing and enlarging his plant as the commercial demand for the Adams press increased, he accumulated a handsome fortune. Bowdoin College was one of the principal objects of his philanthropy, and figured largely in the beneficial provisions of his will. He also founded the Adams Nervine Asylum for the treatment of hypochondriacs. He died at Newton, Massachusetts, Dec. 7, 1873.

ADAMS, THOMAS, an eloquent English and Puritan preacher, of whose personal history few details are precisely known. From 1612 till about 1653 he held charges in Bedfordshire, Buckinghamshire and London. His published works consist of collections of sermons (1618) and a commentary on the Second Epistle of St. Peter (1633).

ADAMS, WILLIAM, an English clergyman and writer of devotional works; born in 1814; was author of *The Shadow of the Cross* (1842), and other sacred allegories. He died at Bonchurch, in the Isle of Wight, 1848.

ADAMS, WILLIAM, an English surgeon; born in London, Feb. 1, 1820. Early in his professional career he was appointed demonstrator of morbid anatomy at St. Thomas's Hospital, London. After holding various other important professional positions and appointments, he was elected, in 1867, vice-president of the Pathological Society. The Harveian Society, in 1873, honored him with its presidency, a like dignity being conferred by the London Medical Society at its annual meeting in 1876. Dr. Adams is the author of several medical works of standard authority in the various branches of higher and modern surgery.

ADAMS, WILLIAM, an American Presbyterian clergyman; born at Colchester, Connecticut, Jan. 25, 1807. He graduated at Yale in 1827, studied theology at Andover, and was ordained pastor of the Congregational Church in Brighton, Massachusetts, in 1831. He took charge of the Central Presbyterian Church, in New York City, in 1834, and became moderator of the new-school General Assembly at Washington in 1852. In 1853 he became pastor of the Madison Square Presbyterian Church, and from 1873 until his death he presided over the Union Theological Seminary in New York City. He contributed numerous articles to various religious magazines and wrote several devout books. He died at Orange Mountain, New Jersey, Aug. 31, 1880.



WILLIAM ADAMS.

ADAMS, WILLIAM FORBES, the pioneer missionary bishop of the Protestant Episcopal Church in the territories of Arizona and New Mexico; born in Ireland, Jan. 2, 1833, he came to America at the age of eight years. At first he studied law and was admitted to the Mississippi bar. Ordained deacon in 1859, and priest in the following year, he became rector of St. Paul's Church, New Orleans. Consecrated a bishop in 1875, he resigned the arduous missionary duties of his see in 1877 on account of ill health. In 1887 he was translated to the bishopric of Easton, in Maryland.

ADAMS, WILLIAM TAYLOR ("Oliver Optic"), an American author, born in Medway, Massachusetts, July 30, 1822. He was for 20 years a teacher in the public schools of Boston, for 14 years a member of the school committee of Dorchester, and for one year a member of the legislature. He wrote numerous novels for young people, two for older readers, and many newspaper stories. Died March 27, 1897.

ADAMS-ACTON, JOHN, an English sculptor; born at Acton, Middlesex, Dec. 11, 1836. He was admitted to the Royal Academy in 1855, winning the first silver medal in each school and the gold medal for his sculptural composition entitled *Eve Supplicating Forgiveness at the Feet of Adam.* His works in ideal sculpture and portrait statuary and busts are numerous and valuable.

ADAM'S APPLE (*Adami pomum*), in botany, the name bestowed by old-time botanists on the plantain tree (*Musa paradisiaca*), from the popular notion that it was the fruit of "the tree of the knowledge of good and evil," eaten by the progenitors of the human race. A species of the *Citrus* has also been so called. In anatomy the term is made use of to denote the protuberance of the *os hyoides* in the front of the human throat. It was fabled to have been produced by the forbidden fruit. See ANATOMY, Vol. I, p. 825.

ADAMSON, JOHN, an English archæologist and

Portuguese scholar, was born at Gateshead, Sept. 13, 1787. His *Memoir of Camoens* appeared in 1820, and *The History, Antiquities and Literature of Portugal* in 1842–46. He died at Newcastle, Sept. 27, 1855.

ADAMSTHAL, a village of Moravia, on the banks of the River Zwittawa, about nine miles N. of the capital city of Brünn. It is a favorite resort for tourists, having in its vicinity the famous Regis-Kala cavern in the limestone rock.

ADAN, LOUIS ÉMILE, a celebrated French painter; born in Paris, March 26, 1839. He studied at the School of Fine Arts and under Picot and Cabanel, and then went to Italy for further instruction. Commencing to exhibit in 1863, he has achieved marked success, especially with aquarelles. He was awarded the gold medal at the Paris exposition in 1889, and received the decoration of the Legion of Honor in 1892.

ADANSONIA, a genus of trees of the family *Malvaceæ*. Linnæus named it in honor of Adanson, the botanist. Two species are known. One (*A. digitata*), commonly called baobab tree, or the monkey-bread tree, is a native of the tropical portion of West Africa, now introduced in the East and West Indies. It is a very large tree, not attaining a great height, but exceeding all trees in thickness. Its trunk is from 20 to 30 feet in diameter, branches 60 to 70 feet long, and often as thick as stems of large trees, forming a hemispherical head of 120 to 150 feet in diameter. The pulp of the fruit is pleasant to the taste, eaten with or without sugar. The expressed juice, mixed with sugar, is much esteemed as a beverage, very refreshing, effectual in quenching the thirst, and valuable in putrid and pestilential fevers. The other (*A. Gregorii*) is a native of Australia, and is known as the cream-of-tartar tree.

ADAR, a month of the Jewish year. See CALENDAR, Vol. IV, pp. 678, 681.

ADEL, the capital of Dallas County, in the southwest-central part of the state of Iowa. It is situated near the Raccoon River, some 22 miles N.N.W. of Des Moines, and is a station on the Des Moines, Northern and Western railroad. Population 1895, 1,081.

ADDEMIRI OR AL-DAMIRI. See DAMIRI Vol. VI, p. 794.

ADDISCOMBE, a word formerly used to designate the military academy founded in 1809 by the Honorable East India Company of England for the instruction of its cadets. Addiscombe House, a seat of the Earl of Liverpool, situated in the parish of Croydon, Surrey, England, about 10 miles south of London, was purchased for the site of the academy. When the company's forces were replaced by imperial troops on the suppression of the Sepoy mutiny in 1858, Addiscombe, where many noted soldiers had obtained their education, ceased to exist. See ARMY, Vol. II, p. 591.

ADDISON, a town of Steuben County, in the western portion of the state of New York. It is 24 miles W. of Elmira, and on the banks of the Canisteo River. The New York, Lake Erie and Western railroad and the Addison and Pennsylvania railroad have depots in the town, which also is the seat of Addison Academy and a large union school. Several factories are in operation, and the town is the center of a tobacco-raising district. Population 1890, 2,166.

ADDISON, LANCELOT, an English clergyman and author, father of Joseph Addison (Vol. I, p. 146); born at Crosby Ravensworth, in the county of Westmoreland, England, in 1632. He graduated at Queen's College, Oxford, in 1655, and became a zealous royalist and Episcopalian. Successively chaplain at Dunkirk and Tangier, a royal chaplain, dean of Lichfield, and archdeacon of Coventry, his principal literary works relate to Barbary and Morocco. He died at Lichfield, Staffordshire, April 20, 1703.

ADDISON, THOMAS, physician, was born near Newcastle-on-Tyne, England, in 1793. He received his medical education at Edinburgh, settled in London, and in 1837 became physician to Guy's Hospital. He made a special study of pneumonia and phthisis, and was the discoverer of what has since been known as Addison's disease. He also wrote on the subjects of poisons and diseases of women. He died June 29, 1860.

ADDISON'S DISEASE. See PATHOLOGY, Vol. XVIII, p. 384.

ADDRESS, FORMS OF, are ceremonious terms employed in addressing oral or written communications to persons bearing titles of nobility or honor, or holding offices under constituted authorities. With titles of nobility republican America has but small concern. The Federal constitution provides (art. i, sec. ix, 8) that "no title of nobility shall be granted by the United States. And no person holding any office of profit or trust under them shall, without consent of the Congress, accept of any present, emolument, office or title of any kind whatsoever from any king, prince, or foreign state."

As regards alien applicants for the privilege of American citizenship, the provisions of the revised statutes require of those who have borne any hereditary titles or orders of nobility in their native lands express renunciation of the same at the time of declaring their intention of becoming citizens, and before the issuance of first papers.

Still, diplomatic intercourse has brought to Washington, in the train of ambassadors, ministers and *attachés*, some of the ceremonious surroundings of the Old World. Certain forms of address are therefore customary in addressing persons officially or otherwise distinguished. A list of those in common use follows.

The President of the United States, by custom, is addressed as "His Excellency." In conversation and formal oral addresses, the term "Mr. President" is used by all other than the President's personal friends or intimate acquaintances.

The Vice-President is addressed, in written communications, as "The Honorable, the Vice-President of the United States," or "The Hon. ——, Vice-President of the United States." When acting as the *ex officio* presiding officer of the Senate the appellation "Mr. President" is made use of by senators.

Cabinet officials are addressed as "The Honor-

able," adding either their names or the official titles of their offices; as, "The Honorable —— ——, Secretary of ——," or "The Honorable, the Secretary of ——."

The justices of the supreme court are addressed by members of the bar practicing before them as "Your Honors." The term "Your Honor" is generally used throughout the United States to address any judicial authority, including justices of the peace. In addressing a written communication to any judge of this court, the rule applying to the Vice-President and members of the Cabinet prevails, as it does also in the cases of lieutenant-governors of states and mayors of cities.

Governors of states and ministers to foreign countries are addressed as "Excellency," the title being sanctioned by usage, with the single exception of the governor of Massachusetts, where, by special statute, the appellation has been made the legal one.

Senators and representatives of the United States, or of the several states, judges of state and Federal courts, and consuls, are entitled to the prefix "Honorable," and their official designation may follow their names.

The forms of address used for church dignitaries vary somewhat with the different denominations. In the Protestant Episcopal Church the bishop is addressed as "The Right Rev.——"; in the Methodist Church, as "The Rev. Bishop —— ——." Clergymen take the title "The Rev.," or simply "Rev.," adding any collegiate degrees to which they may be entitled. Where the designation is founded on any doctorate degree they may be addressed as "The Rev. Dr. —— ——." For Roman Catholic usage, see TITLE, in these Supplements.

The use of "Esq.," in addressing private gentlemen, although quite common, is open to censure, and "Mr.," preceding the name, is much to be preferred.

Where husband and wife are both addressed, the proper form is to give the title of the former, followed by the word "Mrs.," using the given name or initials of the husband; thus, "His Excellency and Mrs. Grover Cleveland," "The Hon. and Mrs. T. B. Reed."

An improper practice has sprung up in recent years, that of widows of prominent men assuming to themselves the address to which the deceased husband was entitled; thus, "Mrs. Gen. John Smith." The error consists both in using the title and the given name of the husband. The baptismal name, or the initials, of the widow herself should be used; as, "Mrs. Mary Smith."

ADELBERT COLLEGE, a college of WESTERN RESERVE UNIVERSITY (q.v., in these Supplements); founded, in 1826, at Hudson, Ohio, under the name of Western Reserve College. In 1828 a theological department was added to the original plan. A medical department was added, with headquarters in Cleveland, in 1843. The college was located at Hudson, in Summit County, some 21 miles southeast of Cleveland, until 1884, when it was transferred to the city of Cleveland, at the same time changing its name and receiving extensive benefactions from Mr. Amasa Stone and the citizens of Cleveland. The curriculum includes three distinct courses, classical, modern languages and Latin-English; while to those students who so desire, there are elective courses in chemistry, physics and biology, in the three remarkably excellent laboratories of the college. Possessing real estate, invested funds and apparatus aggregating in value upward of $1,000,000, the college has a corps of 11 professors and 5 lecturers, under the presidency of Rev. C. F. Thwing. While essentially a Christian institution, the college is in no sense denominational.



ADELBERT COLLEGE, CLEVELAND, OHIO.

ADELPHIA, the stem, signifying brotherhood, to which are prefixed *mon*, *di*, etc., in the Linnæan system of classification, to indicate that the stamens are collected in one or more bundles.

ADEMPTION, in its most important sense, denotes what is called satisfaction in the law of England; viz., that when a testator is owing a debt, or has promised to pay a provision in a marriage contract, if he gives a legacy to the creditor or person entitled under the contract, that may be taken to extinguish the debt or to discharge the provision. Ademption also means that if a testator bequeaths a specific article or property, and before his death the article or property is destroyed or totally changed in character, either by the act of the testator or otherwise, the legatee gets nothing. Various rules have been stated on the subject of ademption, but the courts endeavor to determine the meaning of the testator.

ADEN. The importance of Aden as a strategic position and as a coaling-station has gradually increased with the vast traffic through the Suez Canal. The government is administered by an English political resident, who is also the commander of the troops. The principal exports consist of coffee, gums, hides and skins, and tobacco. Its trade is chiefly one of transshipment. Revenue is obtained from duties on liquor, opium, and salt. Over 2,000 vessels of varying tonnage called at the port of Aden in the year 1894–95. As a coaling-station for the Peninsular and Oriental steamers, and as a depot and coaling-station for the vessels of the British navy, the importance of Aden is very great. The authorities have recently begun to restore the wonderful rock

cisterns to provide a copious water supply for the troops and inhabitants. In 1891 the population (exclusive of troops) was 41,910. See ADEN, Vol. I, p. 152.

ADENINE. See PHYSIOLOGICAL CHEMISTRY, in these Supplements.

ADENITIS (Gr. *aden*, a gland) AND ANGIOLEUCITIS (Gr. *agenion*, a vessel; *leukos*, white), terms employed in medicine to indicate respectively inflammation of the lymphatic glands and inflammation of the lymphatic vessels. Same as Hodgkin's disease. See PATHOLOGY, Vol. XVIII, p. 377.

ADENOCELE (Gr. *aden*, a gland; *kele*, a tumor), ADENOMA OR ADENO SARCOMA. See PATHOLOGY, Vol. XVIII, p. 379.

ADEPT, from *adeptus*, having attained, was formerly applied to those alchemists who professed and were supposed to have discovered "the great secret" of the transmutation of the baser metals into gold. Among theosophists the term is used to signify those students of the occult who have advanced in their researches and studies beyond the stage of pupilage, and especially refers to a select band of nature-students in India who have attained superior wisdom or control of occult forces through knowledge of occult natural laws.

ADET, PIERRE AUGUSTE, a French soldier, scientist and diplomatist; born at Nevers in 1763. Originally in the artillery service, he studied chemistry, and, entering politics, he came to the United States as envoy from the French Directory in 1795; returning abruptly in 1797, alleging that the American government had become guilty of a violation of its neutrality. He died in 1832.

ADHESION, in pathology and botany, a union between two surfaces of a living body which have been, or normally are, separated. In the healing of wounds a cure effected by immediate adhesion of divided surfaces is always rapid and desirable. After injuries to joints, adhesion frequently takes place between the injured structures and those adjoining, causing subsequent stiffness. Adhesion is a frequent consequence of inflammation of serous and synovial membranes.

ADIABENE, the name used by the ancients to designate a small Assyrian province in the valley of the Tigris, not far from the site of Nisibis. It was a dependency of Parthia, and fell under the Roman sway in the days of the emperor Trajan. Helen, queen of Adiabene, and her two sons are said to have embraced Judaism about 15 years before the Crucifixion.

ADIANTUM, a large genus of ferns, whose delicacy and beauty of form has made them exceedingly common in cultivation. They are known in a general way as maiden-hair ferns, the common forms of the United States being *A. Capillus-Veneris* and *A. pedatum*. The spores are protected by the inrolled leaf margins.

ADIATHERMANCE OR DIATHERMANCE, the ability or aptitude for transmitting rays of heat, observed in various substances. This property can be ascertained by placing the substance in question between the source of heat radiance, such as a lamp-flame and a thermopile or thermometer. Rock-salt has been found to be one of the most diathermanous bodies, transmitting as much as 92.3 per cent of the heat radiation thrown upon it.

ADI-GRANTH, the sacred books of the Sikhs. See HINDUSTANI LITERATURE, Vol. XI, p. 845.

ADIPIC ACID ($C^4H^8(COOH)^2$) is a bibasic acid of the oxalic series, having the general formula, $C_nH_{2n}(CO^2H)^2$, and is obtained in the form of white opaque, hemispherical nodules (which are probably aggregations of small crystals) by the oxidizing action of nitric acid on oleic acid, suet, spermaceti, and other fatty bodies. It derives its name from the Latin *adeps*, fat.

ADIRONDACK PARK. With a view to preserving the forests of northern New York, and in so doing to protect the fast disappearing game of that primeval region and to secure for the people resorts famous for their beauty and salubrity, the state legislature in 1892 gave effect to a long-contemplated plan for the preservation and afforestation of the Adirondack plateau.

As early as 1885 legislative enactment of the Empire State had constituted all the lands then owned or thereafter to be acquired by the state of New York, within the counties of Clinton, Delaware, Essex, Franklin, Fulton, Hamilton, Herkimer, Lewis, Oneida, Saratoga, St. Lawrence, Warren, Washington, Greene, Ulster and Sullivan as the Forest Preserve, placing the territory, in 1895, under the control of a fisheries, game and forest commission consisting of three members, appointed by the governor of the state. In addition to the care and protection of the state forests, the commission includes within the scope of its duties the protection of all fish and game, the culture and propagation of food-fishes and shell-fishes, the maintenance of fish-hatcheries and the care of oyster-beds in salt-water. The park itself is in charge of a superintendent, assistant superintendent, two inspectors and a few special foresters, all of whom are appointed by and are answerable to the state commission.

The park, including the lands acquired since 1892, comprises an area exceeding that of the state of Connecticut; 2,807,760 acres, including some million and a half acres of primeval forest, have been preserved for the enjoyment of the people and protected for the benefit of the community. One hundred and eighty-two fire-wardens guard against the ravages of forest fires, and a small army of employees guard against poaching, illegal hunting, and the depredations of timber-thieves, or act as guides for visitors. Excellent work has been done in preserving this vast and natural sanatorium for the use of the invalid and tourist.

The park proper is situated on a vast and extensive plateau, comprising all of Hamilton, and parts of Herkimer, Warren, Essex, Franklin, and St. Lawrence counties, and containing some of the finest and wildest sylvan scenery in the state. On the east Mt. Marcy rears its head to an altitude of 5,379 feet. Eighteen other peaks of the Adirondack range, each over 4,000 feet in height, are in the park. The region of small lakes lies west of the mountains. There are over 1,200 lakes and lakelets, ranging in size from sheets of water 20 miles long to little land-

locked mountain ponds. The lakes, already well supplied with fish, have been further stocked with game fish from the state hatcheries. At Saranac Lake is a great sanatorium for the relief and treatment of consumptive patients only. The lakes are so close that a canoe journey of over 100 miles can be made, with a few portages, and all in the midst of a second Arden, a paradise of green trees and glancing waters. See ADIRONDACK MOUNTAINS, Vol. I, p. 154.

ADJECTIVE LAW, a term used to signify rules of practice and procedure, as distinguished from the substantive law, or the law actually administered by the courts. Codification of all rules of procedure and their simplification is a reform which has exercised the minds of many legal reformers, their efforts having, in some states, taken concrete form upon the statutes. In England all the procedure was so dealt with by the Judicature Acts (1870–75.); see Vol. XIII, pp. 764–5.

ADJOURNMENT, the putting off the remainder of a meeting of a legislative or other body until the next sitting-day, or period. In a wider signification it is used for a postponement until a specified day. In case no day is fixed, the adjournment is said to be *sine die*, and is equivalent to a dissolution. A motion to adjourn takes precedence of every other motion, except that when put and lost it cannot be followed by another motion to adjourn until some other regular business shall first have been considered.

ADJUTANT-GENERAL. The adjutant-general is the head of his department on the general staff of the army, and the executive officer of the general-in-chief. He is charged with the discipline and efficiency of the troops, the details of all military duties, and the accuracy of district returns. He issues all orders to the troops in the name and under the authority of the officer in supreme command, and is the official medium for every report, whether of a confidential or of an ordinary nature. The statutes of the United States provide for one adjutant-general, with the rank of a brigadier-general, his 16 assistants ranking from majors to colonels. Most of the states of the Union have adjutants-general, whose duties are the same in respect of the militia forces of the state. See ADJUTANT. Vol. I, p. 154.

ADLER, FELIX, an American author and orator, and founder of the Society for Ethical Culture, was born in Alzei, Rhine Hesse, Germany, Aug. 13, 1851, and educated in New York, Berlin and Heidelberg. He is the son of Rabbi Samuel Adler (q. v. in these Supplements.) He occupied the chair of Hebrew and Oriental literature in Cornell University between 1874 and the organization, in New York, in 1876, of the new religious society of which he is the head. In 1877 Professor Adler published a series of his addresses, under the title *Creed and Deed*. He has taken part in many philanthropic movements.

ADLER, GEORG J., a well-known German philologist and educator; born in Leipsic in 1821. Emigrating to America in 1833, Dr. Adler was for a considerable period the professor of German in New York University. Many German and Latin textbooks and manuals for school use came from his pen, and, in particular, a useful German-English dictionary. He died in New York, Aug. 24, 1868.

ADLER, HERMANN, a Jewish author and rabbi, son of Rabbi Nathan Marcus Adler, was born in Hanover, Prussia, May 29, 1839. In 1845 he accompanied his father to London, where the latter was called as chief rabbi. He was educated at University College, London, and at the universities of Prague and Leipsic. Ordained a rabbi in 1862, he was in the following year appointed principal of the Jews' College in London, and the following year was called to be rabbi of the Bayswater Synagogue. In 1879 he was appointed coadjutor to his father, and on the decease of the latter in 1890, Dr. Hermann Adler was unanimously chosen to fill the important position of chief rabbi. As a member of royal commissions and as a philanthropist, Dr. Adler has been active in behalf of the poor of every creed. More than any other one man, he drew public attention to the persecution of the Jews in Russia. He has contributed extensively to periodical literature on religious, social and literary themes. One of his principal works was the joint authorship of a reply to Dr. Colenso's criticisms on the Pentateuch.

ADLER, NATHAN MARCUS, a celebrated Jewish rabbi; born in the city of Hanover, Prussia, in 1803. He was the emeritus rabbi at Oldenburg in 1829, was promoted to the rabbiship of his native city of Hanover in 1830, and in 1845 was chosen chief rabbi of the London congregations of the English Jews. In this capacity, until his death in 1890, he was a philanthropist in the widest sense of the word, and of prominence in many public-spirited enterprises for the benefit of the poor of London. He died at Brighton, Sussex, England, Jan. 21, 1890.

ADLER, SAMUEL, a Jewish rabbi; born at Worms, in the grand duchy of Hesse-Darmstadt, Dec. 3, 1809. He was educated at the universities of Bonn and Giessen, 1831–36. In 1842 he was called to be rabbi of Alzei, in Rhine Hesse, Germany. Here he remained until 1857, in which year Emanuel Temple, in New York, called him to become the rabbi. In 1874 he was promoted to be chief rabbi. Deeply learned in the lore of his religion, and a zealous friend of political freedom and religious tolerance, Rabbi Adler was popular among others than those of his flock, and his influence and abilities were recognized by many outside of his parishioners. He died in New York, June 9, 1891.

ADLERBETH, GUDMUND GÖRAN, a Swedish author; born in 1751. He wrote tragedies on historical subjects, and translated Virgil, Horace and Ovid. Died in 1818.

ADLERCREUTZ, CARL JOHAN, COUNT, a famous Swedish general who was born in Finland, April 27, 1757. He served with distinction in the war against Russia and took a prominent part in the war of 1808. When the king, Gustavus IV, excited the apprehensions of his people by several unpopular and unconstitutional acts, Adlercreutz, as the Cromwell of his countrymen, arrested the monarch in the name of the people. On this act his fame, in the main, depends. He died Aug. 21, 1815.

ADLERSPARRE, GEORGE, COUNT a Swedish soldier, statesman and critic. Born in Jemtland, March 28, 1760, he took a prominent part in the wars of 1788 and 1808 against Russia. He was active in the deposition of Gustavus IV. He began, in 1830, to publish certain secret documents of state, for which he was convicted and sentenced to pay a fine, which, however, did not stop their continued publication. He was one of the founders of the Swedish Academy and ranked among the leading critics of his day in Sweden. He died in Wermland, Sept. 23, 1835.

ADLERSPARRE, KARL AUGUST, Swedish poet, son of Count George Adlersparre, born June 7, 1810. He wrote under the pen-name of "Albano," and gained a reputation through his historical writings. He died May 5, 1862.

ADMETUS, KING. See EPIRUS, Vol. VIII, p. 484.

ADMINISTRATOR, in law, is one who administers; one who is commissioned by a surrogate's, probate, or orphans' court to take charge of the goods, chattels and credits of an intestate. In some of the states his jurisdiction is not limited to personal property, but extends to the realty as well. The duty of an administrator is very similar to that of an executor, and consists generally in collecting and paying debts, and distributing the surplus among the next of kin. The administrator is usually selected from the near relatives of the deceased, although sometimes, when the application for administration is made by creditors, one of the latter receives the appointment. There is, also, in some jurisdictions, a public officer called public administrator, who is authorized to administer the estates of persons dying intestate and leaving no relatives qualified to perform the duties. An administrator is appointed only when the deceased has not named an executor, or having named one, the person named refuses to act, in which case the person appointed is called administrator with the will annexed. An administrator is not personally liable, except for torts or for gross negligence or mismanagement. He must give a bond for the faithful performance of his duties, the amount of which depends upon the value of the assets which come under his control. His compensation is awarded by the court, and depends upon the amount of services required and the value of the estate. See ADMINISTRATOR, Vol. I, p. 154.

ADMIRALTY, is a system of jurisprudence which pertains to and has jurisdiction over controversies, both civil and criminal, arising out of navigation of public waters. It is the maritime law. The time of the introduction of admiralty jurisprudence into England has been fixed at the reign of Edward III. The jurisdiction was exceedingly limited, and the high court of admiralty, erected during that reign, was subject to arbitrary correction by the common-law courts. It was not until the beginning of the nineteenth century that these courts obtained exclusive power over maritime controversies. This branch of jurisprudence is exercised in the United States exclusively by the Federal courts, the court of original jurisdiction being the United States district court. The power of these courts extends to the navigable rivers, the lakes and the sea. A civil suit is begun by filing a libel, upon which a warrant may issue for the arrest of the person, an attachment of his property if he cannot be found, or simply a monition for him to appear. All captures by right of war, and seizures on water for municipal and revenue forfeitures, are under the jurisdiction of admiralty. The proceedings in admiralty are generally simple and void of technicality. In criminal cases the procedure is similar to that at common law. Legal practitioners who conduct litigation in courts of admiralty are termed proctors. See ADMIRALTY, Vol. I, p. 158.

ADMIRALTY DROITS, a term used to designate the former hereditary revenues of the sovereigns of England or their appointees, the Lords High Admiral. These arose from the proceeds of sales of enemies' ships detained in prospect of war, or coming into port in ignorance of the outbreak of hostilities, or from such ships as were taken by unauthorized captors, the proceeds of wrecks, the goods of all pirates, and the like. These perquisites were formerly claimed by the Lord High Admiral as incidental to his office. By the Merchant Shipping Act of 1854 all droits of admiralty are now placed under the control of the board of trade, the proceeds being paid into the public exchequer. Derelict ships picked up at sea by British vessels, and all property of a similar nature, if not claimed by the rightful owners, now constitute the principal sources of the admiralty droits.

ADOBE (Span. *adobar*, to plaster), a sun-dried brick, commonly used in Mexico and Central America, and by the Mexican settlers and Pueblo Indians of Texas, New Mexico, Arizona and southern California, and in some other countries where the winters are the reverse of severe. Houses built with them are extremely durable, being susceptible only to the action of heavy and continued rains, and the burrowings of insect pests. They by no means conduce to cleanliness, but are cheap, easily and rapidly constructed, and afford agreeable shelter from changes of weather.

ADONAI, a Hebrew name for the Supreme Being; a plural form of *adon* (lord), combined with the pronoun of the first person. In reading the Scriptures aloud, the Jews pronounce "Adonai" wherever the holy name JHVH is found in the text; and the name *Jehovah* has arisen out of the consonants of JHVH with the vowel-points of Adonai.

ADONI, a town of India, in the presidency of Madras and district of the Deccan. It is situated on one of the branches of the river Tungebadda, and some 175 miles S.W. of Hyderabad. In 1787 the town was reduced to ruins by the victorious Tippoo Sahib. Adoni is a station on the southern extension of the Indian Trunk railroad, and has a population of 22,723 inhabitants, who are mostly engaged in weaving.

ADONIC VERSE, a species of versification consisting of a dactyl and a spondee or trochee. It is well adapted for gay and lively poetry, is common in Horace and other lyric poets, being generally found with three Sapphic lines preceding it. This is known as the Sapphic meter.

ADONISTS, a name given to those Biblical critics who assert that the Hebrew vowel-points written under the word *Jehovah* are not the points which properly belong to that word. The Adonists claim that these vowel-points appertain to the words *Adonai* and *Elohim*.

ADORNO, ANTONIO, a doge of Genoa, whose troubled and thrice-interrupted rulership, in the latter half of the fourteenth century, is only remarkable for the fact that, by persuading his countrymen to assent to the treaty of 1396, he sold them into vassalage to Charles VI, king of France.

ADRAMYTI OR EDREMID, a town on the west coast of Asia Minor, opposite Mitylene. It is encircled by an olive-growing district, and corresponds to the Adramyttium of the ancients. The town is about three miles inland. Population, 8,000. The name is also applied to an arm of the Ægean Sea.

ADRASTEIA, in mythology, a surname of Nemesis, signifying one who cannot be escaped. Another origin is attributed to the name as derived from Adrastus, who is said to have built the first sanctuary to Nemesis on the river Asopus. The name is also given to a Cretan nymph, the daughter of Melisseus, to whom Rhea is fabled to have intrusted the infant Zeus, or Jupiter, to be reared in the Dictæan grotto.

ADRIAN, the capital of Lenawee County, Michigan. The principal features of Adrian are the handsome and very costly opera-house and the Masonic Temple, each erected at a cost of over one hundred thousand dollars. The principal industries are the manufacture of railroad-cars and street-railroad equipment, furniture, felt and straw goods, and brick and tile making machines. Immediately west of the city the fine buildings of Adrian College are located. It was established in 1859, under the auspices of the Methodist Church, for the co-education of the sexes, and has been very successful. There are 15 instructors, under the presidency of Prof. D. C. Thomas, and an average of 250 students. The college possesses an annual income of over twelve thousand dollars, and invested funds of eighty-five thousand dollars or more. Population of the city, 1896, 9,511. The city has stations of the Lake Shore and Michigan Southern and Wabash railroads within its limits. See ADRIAN, Vol. I, p. 165.

ADRIANISTS OR ADRIANITES, followers of Adrian Hamstedius, a sixteenth-century heretic. They maintained that the body of Christ was formed entirely of the substance of the Virgin Mary. The followers of Simon Magus are also called Adrianites.

ADULLAM, in Scripture geography, a city in the plain country of the tribe of Judah. It is a place of great antiquity, being mentioned in Gen. xxxviii, and was the capital of a Canaanite kingdom at the time of the Israelitish conquest. The town Adullam was probably near *Deir Dubban*, near the great limestone cliffs pierced with excavations. The cave Adullam, in which David took refuge after escaping from Gath (1 Sam. xxii. 1), was probably situated among the mountains to the east of Judah, near the Dead Sea. From its being described as the resort of "every one that was in distress," or "in debt," or "discontented," it has often been humorously alluded to, as by the Baron of Bradwardine in *Waverley*, ch. lvii. The cave was capable of concealing 400 men.

ADULLAMITES, the nickname bestowed by John Bright, the English statesman, on a group of Liberal politicians who voted with the Conservative party on the introduction of the reform of the Franchise Act in 1866. The jest was dangerous, as double-edged, Lord Elcho at once retorting that the band in the cave increased hourly, and would ultimately deliver the English House of Commons from the tyranny of Saul (Mr. Gladstone) and his armor-bearer (Mr. Bright). Hence, in newspaper diction, Adullamites is a term used to signify any group of dissatisfied or disgusted politicians who desert their own party and vote in the interests of an opposite party.

ADULTERY, at common law, the voluntary sexual intercourse between a married woman and a man other than her husband. The offense was not indictable or subject to punishment except by the ecclesiastical courts, but was a sufficient ground for granting a divorce and for maintaining an action for damages at the instance of the husband of the guilty woman. Illicit intercourse between an unmarried woman and a man, whether married or single, is termed fornication. In many parts of the United States the common-law rule has been changed by statute, which declares adultery to be any illicit intercourse of a married person, male or female, with a person other than the offender's husband or wife. In many states, adultery has been made a crime, punishable by fine or imprisonment, or both. Otherwise the common-law rule generally remains unchanged. Where the intercourse is between a married person and one who is unmarried, the crime as to the married person is adultery, and as to the unmarried person fornication. In case the criminal intercourse is between persons both of whom are unmarried, the criminal prosecution may generally be suspended by subsequent marriage and payment of the costs of the prosecution. Living in adultery means the carrying on of habitual adulterous intercourse between the same parties, whether actually living together in the same house as man and wife, or not. The civil action, in this country is generally brought by the husband of the offending wife against the co-respondent, claiming damages for the alienation of his wife's affections, and can be maintained without proof of actual adultery. See ADULTERY, Vol. I, p. 177.

ADVANCEMENT, a gift from a parent to his child in anticipation of such child's inheritance upon the death of the parent. The amount of an advancement will be deducted from the child's share of the estate upon the distribution after the parent's death. The question of whether a gift is an advancement is to be determined by the intention of the parent. Money given for the support of the child, or for his education, is not generally an advancement, where it is intended merely to pay the actual expenses. It is not necessary that any particular form be followed, to consti-

tute an advancement, except in states where a particular form expressing such intention is established by statute. In computing the value of an advancement of real estate for the purpose of deducting it from the share upon distribution, the value at the time the advancement was made is to be taken, but interest will not be charged. An advancement is an absolute gift, and if it should prove to be more than the child's proportionate share of the estate, he will not be required to relinquish any part of it.

ADVANCEMENT OF SCIENCE, ASSOCIATIONS FOR. The British Association for the Advancement of Science was founded in 1831 at a meeting of eminent scientists at York. Among those taking part in the inauguration of the society were Sir John Herschel, Sir John Brewster, Sir Humphry Davy, and others. Its annual meetings occupy a week in each year, and are held in the various important towns of the United Kingdom. The sciences are divided into eight sections, or heads, and papers read and discussed in a like number of concurrent meetings, before an average attendance of 2,000 of the 4,600 members of the society. Discussions follow, and the society annually grants some $5,000 for the prosecution of scientific research under the direction of its committees.

The American Association for the Advancement of Science commenced its existence as the Association of American Geologists, which organized, in 1840, in Philadelphia. At a meeting of this body in Boston in 1842, its operations were extended, and the title changed to the Association of American Geologists and Naturalists. Five years later, and at another Boston reunion, it again enlarged its scope and took its present title. Like the parent and British society, it is migratory, holding its annual meetings in the various cities of the Union. It has a membership of 1,820 and a fellowship of 800, admission being practically confined and restricted to Americans and Canadians. The admission fee is fixed at $5, with annual dues of $3. Permanent secretary, F. W. Putnam, Cambridge, Massachusetts. See also SOCIETIES, Vol. XXII, pp. 222, 223.

ADVENTISTS, a collective term used to designate six recent separate bodies of Christians, the distinctive and occasionally fervid feature of whose faith is the speedy second coming or advent of Jesus Christ. Their origin was as the followers of William Miller, "The American Prophet" (1781–1849), who had at one time a following of over 50,000 people. In 1833 he fixed the millennium for Oct. 10, 1843, and after that date had passed, spoke of other and probable dates. At the present day there are over 70,000 members of Adventist churches, divided into six principal denominations. In doctrine and practices they are Congregational as regards church government; they practice immersion; and they hold evangelical views as regards the general matters of faith. According to the census returns of 1890 the six denominations may briefly be described as follows: 1. THE EVANGELICAL ADVENTISTS, claiming to be the original body formed in 1845. A peculiar feature of their creed is a belief in a species of purgatory and in eternal and indefinite future punishment. They number 1,147 members, and have an organ, *Messiah's Herald*, published in Boston. 2. THE SEVENTH-DAY ADVENTISTS, also dating from 1845, observing Saturday as the day of rest, and practicing foot-washing. They number 28,991 members, and present their views in *The Advent Review*, published in Battle Creek, Michigan. 3. THE CHURCH OF GOD, a branch of seceders from the Seventh-Day Adventists, formed in 1866. They deny the dominion of the beast, mentioned in Rev. xiii. 11–17, over the United States, number under 1,000, and propound their doctrines in *The Advent and Sabbath Advocate*, of Stanberry, Missouri. 4. THE LIFE AND ADVENT UNION, a society formed in 1848 and formally organized in 1864. It numbers about 1,000 members, some of whom are in Great Britain, and issues *The Herald of Life*, from Springfield, Massachusetts. 5. THE AGE-TO-COME ADVENTISTS, an organization dating from 1851, and on its present basis from 1881, numbers about 4,000 members in Canada and the United States, and issues *Words of Cheer*, from Brooklyn, New York. 6. THE ADVENT CHRISTIANS, an organization dating from 1861, and now extending through all the states and in other countries. It numbers 25,800 members, and issues a publication called *The World's Crisis*, at Boston, Massachusetts.

ADVERSE POSSESSION, in law, is the possession of real property avowedly contrary to the claims of another, so as to deprive the latter of the seisin. Adverse possession is such possession of land as shows that the party holds, under claim of right in himself, as against all who may claim under any other right or title. Adverse possession is such as is inconsistent with the right of others to hold possession. Continuous adverse possession for a period of twenty years raises a presumption of a grant, and the party cannot then be dispossessed; but the possession must be such as would be hostile to the claim of title by any other person. Any recognition of right in the claim of any one else, as by paying rent, will defeat a claim of right to the estate based upon adverse possession for twenty years.

ADVERTISING includes all efforts to give notoriety to facts. The means most generally adopted is through the medium of printed matter, either in the columns of newspapers, the pages and covers of magazines or other periodicals, publications specially devoted to the subject-matter of the advertisement, and by placing before the general public, in a variety of other ways, the information sought to be disseminated. Modern advertising has kept abreast of the march of progress in other directions, and its growth has been little short of marvelous, the estimate having been made that each decade since the middle of the century has witnessed an increase of fully one hundred per cent over the preceding one. The widest distribution of advertisements is through the medium of newspapers and magazines. Of the former the daily papers carry about two thirds of the business, the weeklies the other third. The large metropolitan newspapers are extensively patronized, the Sunday editions being specially favored by large retail houses, in the columns of which they announce their attractions for the ensuing week. A paper of the class mentioned, in the city of Chicago,

has had in a single issue approximately twenty-five thousand dollars' worth of advertising. That the annual receipts of such a paper should be enormous is easily reckoned. The large local advertisers, almost without exception, deal directly with the newspapers, and are allowed discounts from the regular rates, varying with the amount of advertising contracted to be used within the current year. Magazine advertising has become popular with advertisers who desire to have notice of their wares placed before the better class of people. The intelligent men of professions, offices and trades, and students, mothers and daughters, and well-informed, well-to-do men and women do not unite in reading any other class of publications, but all seek the magazines. This fact, together with their immense circulation, constitutes the importance of magazines as advertising media, and the publishers supplement this advantage with everything that careful printing and elegant paper can accomplish in making the advertisement effective by attractiveness. Examination of a list of the prominent magazines of this country, giving the amount of their monthly issues, discloses the fact that they range in circulation from 10,000 to 715,000 copies, and that the total annual circulation is over 70,000,000 copies. Single pages for advertising purposes in these publications cost according to the circulation of each particular magazine, and prices range from $25 to $4,000, and in some of those of the largest circulation no discounts are allowed for extended space or frequency of insertion. The total number of newspapers and periodicals, excluding those not patronized to any great extent by advertisers, in the United States, in 1895, was 20,255, published in 8,186 towns. Estimates have frequently been made as to the amount of advertising annually carried by these publications, but, varying as they do from fifty million to eighty million dollars, no great weight attaches to their accuracy. Illustration, as a means of attracting attention to a particular advertisement, is extensively used, and has been brought to a point of perfection where many pictures are really works of art, and certain to attract the eye of the reader. Full-page illustrations in colors are frequently designed by the most prominent artists, and when placed on the outside covers of leading publications cost an enormous amount of money to carry them, running in one case well known to the advertising world, where 16 tints and colors were used, to more than ten thousand dollars for a single insertion. Advertising is the chief source of profit to many of the newspapers and periodicals, and the exclusive source to the majority of them, the selling-price of single copies allowing no profit, and in many cases involving a positive loss. In consequence of this fact, the publisher seeks as large an amount of advertising as it is possible to obtain. Solicitors are allowed liberal commissions, and all prospective advertisers are constantly beset by these agents, who furnish, to the periodicals represented by them, the major portion of the advertising business received. During the development of advertising into its present proportions the advertising agency became an indispensable adjunct to the handling of the immense business done by large advertisers, and has constantly grown in favor. There are several prominent agencies in the United States that relieve their clients of the details incident to advertising, and this without expense to the advertiser. When desired so to do, the agency prepares the advertisement and illustrations, keeping for this purpose a corps of trained writers and skilled artists, and attends to inserting the advertisement in the publication desired, looks after the proof of publication, and pays the bills due the several periodicals. With these advantages to be had without cost, few advertisers of any importance, who desire more than local distribution of their advertisements, give the matter any attention further than to place the sum desired to be expended in the hands of a favorite agency, with instructions as to the class of publications to be employed and the territory to be covered. By this means the advertiser avoids the cost of maintaining a large clerical force to perform exactly the same work transacted by the agency. In addition to the means for the dissemination of advertisements above mentioned, pages in and covers of books are used, as are separate publications devoted solely to the promotion of the sale of the article described. These latter consist of pamphlets, almanacs, calendars, folders, cards, pictures with printed matter on the margins, circular letters and other well-known means of attracting the attention and announcing the merits of particular articles. Other vehicles for the carrying of advertisements are bill-boards, dead-walls of prominent buildings, the interior of street-cars and railway trains, roofs and sides of barns and factories conspicuous to the traveling public, as well as fences along the highways, rocks, trees, bridges, and, in fact, every thing and place at all likely to be observed by the many is utilized for the purpose of making a display of advertising matter, until one is scarcely ever out of sight of an announcement of some description.

See ADVERISEMENT, Vol. I, pp. 177, 178.

ADVOCATES, FACULTY OF, in Scotland. The body of Scotch lawyers, who were recognized as a distinct profession by a statute passed in 1424 for securing the assistance of advocates to the poor. Though existing as a profession, there was no society formed until the institution of the College of Justice in 1532. The faculty was at one time a highly aristocratic institution, but is now recruited from all classes of society. Two examinations are imposed on candidates for admission,—one in general scholarship, the other in law. An advocate is entitled to plead in every court in Scotland, civil, ecclesiastical or criminal, superior or inferior, and also before the House of Lords. The supreme judges of Scotland and the principal judges are always, and the sheriff-substitutes generally, selected from the bar.

ADVOCATES' LIBRARY, a library belonging to the Faculty of Advocates in Edinburgh. It was established in 1682 by Sir George Mackenzie, of Rosehaugh. By the first Copyright Act, passed in 1709, the privilege of receiving a copy of every book entered at Stationers' Hall was conferred on the Advocates' Library, and the privilege is still retained by it. The number of volumes in the library is

about 305,000 and there are about 3,000 volumes of MSS. Although the library belongs strictly to the Faculty of Advocates, it is open to all engaged in literary work; and so liberal is the administration that it is practically the public library of Scotland. The management of the library is intrusted to a keeper and staff of assistants, working under a board of six curators. Among the noted men who have held the office of keeper may be mentioned David Hume, Adam Ferguson and Samuel Halkett.

ADVOCATUS DIABOLI, "the devil's advocate," a name given in the Romish Church to a person appointed to state all possible objections to a candidate for canonization as a saint. He is in opposition to the *advocatus Dei*, "God's advocate," who undertakes the defense. The term is often applied to one who brings forward malicious accusations.

ADYE, Sir John Miller, General, an English soldier; born at Sevenoaks, Kent, England, Nov. 1, 1819. Entering the Royal Artillery, he served through the Crimean War and Indian Mutiny with credit and distinction. After holding various military appointments, he proceeded to Egypt as chief of staff and second in command in the expeditionary force of 1882. For three years from 1883, Sir John Adye was the governor of the Rock of Gibraltar. He wrote several volumes of military reminiscences.

AËDON. In the mythology of Greece she was the daughter of Pandareus of Ephesus, wife of Zethus, king of Thebes, and mother of Itylus. Envious of Niobe, the wife of her brother Amphion, who had six sons and six daughters, she resolved to kill the eldest of Niobe's sons, but by mistake slew her own son, Itylus. Jupiter, or Zeus, to assuage her grief, changed her into a nightingale. The melancholy notes of the nightingale were then said to be Aëdon bewailing her child. In all the varied versions of the myth the transformation to the nightingale is the only portion that remains constant.

ÆDUI or HEDUI, a powerful tribe of Gaul in the days of Julius Cæsar. They occupied the land between the Liger (now the Loire) and the Arar (now the Saône). They were the first of the Gauls to conclude an alliance with the Roman invaders, being styled the "brothers and relations" of the Romans in the treaty. Cæsar freed them from the yoke of Ariovistus in 58 B.C., a kindness which they repaid six years later by joining the other Gauls under Vercingetorix in the final struggle for independence. After his victory Cæsar treated them with leniency for the sake of the old alliance. Their capital, Bibracte, corresponds with the modern Autun.

ÆGIDIUS A COLUMNIS, a scholastic philosopher, prior-general of the order of the Augustines, and mainly celebrated as the defender of the doctrines of Thomas Aquinas. Ægĭdius was tutor to Philip the Fair, and in 1296 was consecrated archbishop of Bourges. He is popularly known as "Doctor Fundatissimus" (the doctor most profound.) Born in Rome about 1247, he died in 1316, leaving a large number of manuscript writings.

ÆGINETAN SCULPTURES. See Ægina, Vol. I, pp. 180, 181.

ÆGIR, the god of the ocean, in ancient Norse mythology. He is represented as a giant in stature and as a water-demon, but is supposed to personify the more propitious elements. His wife was called Ran.

ÆGIRA or ÆGEIRA, the Hyperesia of Homer, a town in Achaia, ancient Greece, on a steep hill, with a seaport about twelve stadia, or one and one-third miles, from the town. To this place the inhabitants of Ægæ, in Achaia, one of the 12 Achaian towns, removed. It was famed for its temple of Aphrodite. The exact site of the town is uncertain.

ÆGIUM, a town of ancient Achaia, corresponding with the modern Vostitza. After the destruction of Helice by the great earthquake of 373 B.C., Ægium was chosen as the capital of Achaia. Here were held the meetings of the Achaian League, in a grove of Jupiter named Homarium. In 1817 Vostitza was severely damaged by an earthquake. Its present population is a little over 5,000.

ÆGLE MARMELOS or BEL, is a fruit-tree of the family *Rutaceæ*, growing in India. The fruit, otherwise called golden apple and Bengal quince, is aromatic, irregular in form, and from 5 to 9 inches in diameter. The rind produces a yellow dye, and is used in perfumery. The dried fruit, under the name of *Bela*, has been recently described in the British pharmacopœia as mildly astringent, and is in much favor as a remedy for diarrhœa and dysentery. It has been suggested that this remarkable tree might be grown to advantage in the Southern states.

ÆGYPTUS. See Danaus, Vol. VI, p. 797.

ÆLIUS, STILO. See Stilo, L. Ælius Præconinus, in these Supplements.

AELST, Eberhard Van, a Dutch painter, famous for his dead-game and fruit pieces. Born at Delft, 1602; died 1658. His nephew, Willem Van (1620–79), was as distinguished for his flower and fruit pieces as was Eberhard for his canvases of game.

ÆNEID. See Virgil, Vol. XXIV, p. 248.

ÆOLIAN ACCUMULATIONS is a term in geology applied to accumulations of detrital matter, such as fine loam or sand, as found in the sand-hills of many maritime regions, and similar hillocks which occur in the Sahara, Utah, Arizona, etc., formed by the action of the wind. The *loess* of the desert of Gobi are the most noted instance.

ÆOLIAN INSTRUMENTS, musical instruments played by Æolus, god of winds, and of ancient origin. One of the oldest and most simple of these is the æolian harp, a simple musical instrument producing harmonic sounds when exposed to a current of wind. A simple form of this instrument is a box of thin wood, open at the ends, to which are fastened several catgut cords, all tuned in unison and stretched over low bridges at each end. The wind makes a music of a drowsy and soothing kind. St. Dunstan is said to have been the inventor. An attachment for the pianoforte is named the æolian attachment, by which a stream of air can be injected over the wires. It has the effect of prolonging the vibration and of thus increasing the volume of sound.

ÆOLIANS, one of the principal races of the Greeks, originally settled in Thessaly, from which

they spread and formed many settlements in the northern parts of Greece and east of the Aègean Sea. They were fabled to be descendents of Æolus, the son of Hellen. About the eleventh century B.C. a part of them emigrated to Asia Minor, where they founded more than thirty cities on the northwestern coast, in Mysia and the surrounding isles. Among these cities are Smyrna, and Mitylene in the island of Lesbos. Here the Æolic dialect of the Greek language chiefly developed itself, especially in the form employed in the poetry of Alcæus and Sappho.

ÆOLIPILE OR ÆOLYPYLE, a hollow metallic ball from which, when filled with water and heated, steam issues by armlike orifices bent in opposite directions. This causes the ball to revolve rapidly. It is said to have been invented by Hero of Alexandria.

AERIAL PERSPECTIVE. See PROJECTION, Vol. XIX, p. 793.

AËRIANS, a sect of Arian reformers, founded by Aërius, a presbyter of Sebastia in Pontus, Asia Minor, about 350 A.D. They held that a presbyter was in no wise inferior to a bishop; they denounced masses for the dead and objected to church fasts. In ecclesiastical polity they anticipated modern Presbyterianism.

AEROCLINOSCOPE OR AEROKLINOSCOPE, an instrument used in Europe, in connection with weather signals, to publicly exhibit the difference of barometric pressure at different stations. The aeroclinoscope was invented by Buys Ballot. One form is a pole 30 feet high, turning on a pivot, and having on the top a horizontal arm capable of being inclined more or less. The system of working this arm is necessarily first settled by conventional agreement.

AEROMETER, an instrument invented by Dr. Marcus Hunt for determining the weight of air or ascertaining its density, or for finding the exact density of gases.

AERONAUTICS. Since 1890 the science of aerial navigation has made material progress, principally through the experiments of Hiram S. Maxim, of England; Otto Lilienthal, of Prussia; Samuel P. Langley, of the United States; and Lawrence Hargrave, of Australia. To Maxim is due the honor of inventing and building the first flying-machine that really lifted itself from the ground by its own internal force, without the aid of a balloon. The success of all the scientists mentioned is due to the development of aeroplanes and a better understanding of their lifting-power than was possible before their experiments were made.

Maxim's machine consisted of a great kite-like aeroplane, with smaller aeroplane above and others on the sides, the propelling machinery being borne on a truss deck below the large aeroplane, and flanked by other small aeroplanes. All experimenters appear to have reached the conclusion that the best results are obtainable by placing the aeroplanes thus, one above another, at considerable distances, so as not to interfere with each other's supply of air. Mr. Maxim had great difficulty in constructing planes that would not bag nor flap. No better material was available than balloon cloth, and this was found to exhibit a great tendency to double, so that the lifting power of the plane was destroyed. This trouble was overcome by stretching two thicknesses on a tubular framework and making the lower thickness slightly porous, while the upper thickness was airtight. An aeroplane thus arranged was found to preserve its flat lower surface, the billow-like flapping being all transferred to the upper thickness, where it proved to be of little disadvantage. The aeroplanes thus made were held in the desired three-decked form by tubes and wires of the lightest and strongest steel. Their total area was 4,000 square feet, the greatest length being 125 feet, and width 104 feet.

The propelling power used was steam, and it was necessary to invent a special engine and boiler to secure the requisite power within the limits of weight. This was accomplished by building a boiler of thin copper water-tubes, through which a forced circulation of water was maintained, so that it was possible, by coiling the tubes, to obtain 800 feet of heating surface with only 34 feet of flame surface. This boiler was capable of containing 200 pounds of water, and its own weight was 1,000 pounds more, yet it made steam fast enough for the 364 horse-power engines which were used. The fuel used was gasoline, which was delivered under pressure so as to produce a flame 22 inches high. But this marvelously light boiler was eclipsed by the steam-engines which were of the double-expansion type, and weighed less than two pounds to the horse-power. They were made of high-grade steel, many of the parts being tempered to secure greater strength with less weight. They obtained their high efficiency partly by using the steam at the high pressure of 300 pounds, and partly by a piston-speed of 750 feet a minute.

Two screw propellers, each of 17½ feet diameter and 16 feet pitch, were used to drive the airship, and also for steering. Being placed side by side, and run by separate engines, it was only necessary to slightly reduce the speed of one engine and its propeller to cause the machine to turn to that side.

July 31, 1894, this flying-machine was tried, being mounted on a track, along which it was designed to run on wheels until it acquired sufficient momentum and lifting power to fly. Upper rails were provided to prevent its flying beyond control, and it developed so much lifting power as to bend the axles of the upper rail-wheels, tear up the track, and finally to wreck itself. Three trips were made over the track, each time with an increased pressure of steam, and corresponding increase in lifting power developed. On the third run, when the break-up occurred, the steam was at 310 pounds, or 40 pounds less than the engines were designed to sustain. The dynograph used recorded the following lifting power at each one hundred feet of the trip, until the break-up: 700, 1,700, 3,000, 3,700, 3,950, 5,750, 6,600, 6,450, 6,500, 8,700. This record is of particular interest, showing that a large airship can gain sufficient headway to rise with a run of only 600 feet, and affording actual evidence of the rapidity with which lifting power increases with a gain in speed.

The scientific world awaits with interest further experiments by Mr. Maxim.

Lawrence Hargrave has contributed many interesting facts and experiments to the world's knowledge of kite-flying, aeroplanes and mechanical birds. Among other ingenious devices made by him was a tube seven feet long, bearing a pair of wings operated by compressed air in the tube, which formed the backbone of his mechanical bird. The whole apparatus weighed only 59 ounces, and, when charged, flew 350 feet through the air before falling. The published statements of Mr. Hargrave in 1893, regarding cellular kites, as he called them, attracted much interest. His discoveries were given to the public without any attempt to protect them by means of patents. He found that kites made of rectangular cells set together like the cells of a honeycomb, and open at both ends of each cell, flew much easier and steadier, and with greater pulling-power, than any other design. It did not appear to make much difference how the cells were arranged, provided they did not interfere with each other. As usually made, they resemble a number of oblong paper boxes from which the front and back sides have been removed, the whole being fastened together by light strings or threads. Mr. Hargrave found that by building the horizontal surfaces upwardly convex about twice as much pulling-power was developed on the string than where plane surfaces were used. Numerous experimenters have practiced with the Hargrave kites, those less than three feet over all being found most satisfactory, because the larger ones pulled so that they were difficult to handle. A one-and-a-half-pound Hargrave kite with a total area of but 10 feet of surface develops 17 pounds of lifting capacity in a 25-mile breeze. Such kites may be run up to considerable elevations, and used to carry thermographs or other instruments of observation.

From 1890 Otto Lilienthal, a Prussian engineer, engaged in studying and making soaring apparatus, with which he skimmed down on the air from a hill-top. He completed a number of mechanisms, and learned much about this sort of flying. He had soared nearly a thousand feet before alighting, but on Aug. 11, 1896, fell from his machine and was killed. He built a cone shaped hill on purpose to secure a good place for his experiments. His first apparatus was made of cotton twill stretched on a wooden frame like the leaf of a water-lily, only that the area was some 15 meters in extent. Through the center of this he thrust his head and shoulders, taking hold of the frame with his hands, and supporting himself by the armpits. His method was to take a run from the top of the hill against the wind, and jump into the air, holding his framework, or aeroplane, at the angle of 1° to 8°, so as to slide down on the air. In the course of time he was able to guide the apparatus to a considerable extent, by the swaying of the lower part of his body, and the management of a sort of tail, or rudder, attached to the planes. After some experimenting with this apparatus, Mr. Lilienthal was able to improve it by arranging the parts so that they could be folded up and carried indoors, also by the formation of a strut-frame, giving greater strength without more weight. He was also able to change the form, and obtain one that acted like a parachute, in that it enabled him to jump from any height without danger of turning and losing the support of the air.

In 1895 Mr. Lilienthal completed a new form of apparatus, in which he made use of two aeroplanes, superposed, with a flying tail hung in the rear, between them. With this form he was able to secure the management of a much larger area of supporting surface, and he often sailed to a considerable height, being lifted by gusts of wind. The flights were always against the wind, which thus exerts a lifting power proportioned to its velocity. At the climax of a flight it was often possible to remain practically stationary for some time, conversing with those below. Mr. Lilienthal next endeavored to learn to soar in circles with his apparatus, in imitation of the soaring of birds, being convinced that with a little more practice this could be done. His experiments, as far as they went, wholly confirmed the theories of Professor Langley.

Mr. Lilienthal, up to the time of his death, had built probably a dozen of his soaring apparatuses, trying all sorts of devices for increasing their lifting power and steering qualities. His later aeroplanes are much more stable than the earlier forms. He tried various sizes, and found the best results with surfaces of about 100 square feet each. These surfaces are hinged in the middle, like wings, and measure about 18 feet from tip to tip.

Professor Langley's aeroplane-bird, or airship, was made of aluminum, and consisted of four aeroplanes, each having an area of 8 by 12 feet. It is described as "porpoise-shaped" in appearance. He used two small screw propellers and a very light form of steam-engine. It was designed to be partly sustained on the air like a kite, and partly by the force of the propellers. When tried at Quantico, Maryland, in December, 1894, its action was eccentric, and it is still in an experimental stage. The setting of the wings or planes determined the angle at which it sailed. Professor Langley has published a valuable pamphlet, entitled *The Internal Work of the Wind*, in which he sets forth the result of some of his investigations and experiments. He has demonstrated that the wind is very uncertain and irregular in its action, varying amazingly in its velocity within very short periods of time, so that the common expression that the wind blows 20 or 30 miles an hour conveys an erroneous idea of the way in which the wind moves.

There are numerous other experimenters in the field of aeronautics and aerodromics. Messrs. Riedinger, Von Sigsfeld and Von Parsfal, of Augsburg, Bavaria, made extensive and costly trials of models designed for automatic flight. Charles H. Lamson and J. B. Millet have experimented with kites of the Hargrave type, and the former has invented a multiplane folding kite. Professor George Wellner, of Brünn, Austria, designed, in 1893, an airship to be supported by sections of tubing of very large diameter, within which rotate sail-wheels of a peculiar pattern. He has patented these sail-wheels, but at the last account the ship had not been constructed. Between 1890 and 1893 Horatio Phillips,

of England, made many experiments with an aeroplane apparatus, which he whirled around on a circular track. His machine weighed 350 pounds, and had a series of aeroplanes arranged somewhat like the slats of a Venetian blind. These slats were 22 inches wide, and curved in imitation of the wing of an albatross. He constructed a propeller to drive this machine, but never succeeded in making it self-sustaining.

Notable investigations on atmospheric movements have been made by Helmholtz of Berlin, L. P. Mouillard of Paris, and Lord Rayleigh of England, each of whom has contributed within recent years to the literature on the subject. See also AERONAUTICS, Vol. I, pp. 185–207.

AEROPHORE. See COAL, Vol. VI, p. 73.

AEROPHYTES, plants which derive all their sustenance from the air, as certain orchids and bromelias. Among the latter is the *Tillandsia*, or "long moss," of the South. For further description, see EPIPHYTES in these Supplements.

AEROSTATIC PRESS, a machine used for extracting coloring matter from dyewoods. A vessel pierced with holes is divided by a horizontal partition, the dyewood containing the coloring matter is laid upon this, and a perforated cover over it. An extracting liquid is then poured on the top and, the air being drawn from the under part of the vessel by a pump, the liquid is forced through the dyewood by the pressure of the air.

AEROSTATICS. That branch of the science of mechanics which treats of air at rest,—that is, with its particles in equilibrium. On the other hand, the science of pneumatics, as opposed to aerostatics, treats of air in motion.

ÆTIOLOGY (Gr. *aitia*, cause; *logia*, discourse), the science or philosophy of cause and causation, especially in the department of biology, which seeks to give a rational account of the forms, functions and history of organisms. The term is also used to describe the branch of medicine which investigates the causes and origin of diseases.

AETOMORPHÆ, the birds of prey; equivalent to the group called *Accipitres* or *Raptores*, by most writers. See ACCIPITRES, in these Supplements.

AFFIDAVIT, a written statement made under oath or affirmation before an officer authorized to administer oaths. The officers before whom affidavits are most frequently made are judges, officers of a court, or notaries. At common law notaries public had no authority, *ex officio*, to take affidavits, but by statute they are given this power throughout this country. An affidavit should contain the title of the cause if it is to be used in a legal proceeding, the venue, the signature of the party making the affidavit, the jurat or certificate of the officer, and the seal of the officer. An affiant is one who makes an affidavit. A supplemental affidavit is one made to correct an error or omission in a prior affidavit. A counter-affidavit is one made to deny or avoid the averments of another affidavit. See AFFIDAVIT, Vol. I, p. 226.

AFFIRMANCE, the express confirmation of an act of doubtful validity, for the purpose of making it binding. Express affirmance is where the party expressly declares his intention to abide by his act. Implied affirmance is such as will be implied from the acts of the party. Affirmance by a court is where, on appeal, the judgment of the lower court is sustained.

AFFORESTATION. See Vol. IX, pp. 397–410; and FORESTRY, in these Supplements.

AFGHANISTAN. For general description, features and events prior to 1872, see AFGHANISTAN, Vol. I, pp. 227–241. Early in 1873 Shere Ali proclaimed Abdulla Ján as his heir apparent, and the following year confined his eldest son, Yakub Khan, as a close prisoner at Kabul. Shere Ali welcomed a political mission from the Czar, but declined to receive a similar English embassy. The British feared that the so called scientific frontier of India was in peril. Negotiations were fruitless. On Nov. 22, 1878, the British forces under General Roberts shelled Ali Musjid, and, rapidly pushing forward, occupied Jelalabad on December 20th. Shere Ali fled to Russian territory, and Yakub Khan assumed command of the tribesmen confronting the British. As the troops advanced, Shere Ali died, Feb. 20, 1879, Yakub being recognized as Ameer. He speedily concluded peace with the advancing British, and by the treaty of Gandamak, May 26, 1879, ceded the Kurum, Sibi and Pishin valleys to the invaders, and agreed to receive a permanent British resident at Kabul.

The British government agreed to defend Afghanistan from all foreign aggression, and the Khyber and Michni passes were left under their control as as part of the scientific frontier of India. This placed matters on a settled basis for a time, but in September of the same year the revolted troops of the Ameer treacherously attacked the British residency and massacred the small garrison, with Sir Louis Cavagnari, the resident, and all his staff. With 6,000 men Sir F. Roberts at once marched to Kabul. He defeated the Afghans on October 6th, at Charasiab, 12 miles from Kabul, and on the 12th entered the capital. Yakub abdicated on the 19th of October. In June, 1880, Ayub Kahn, the younger brother of Yakub Kahn, proclaimed a ghaza, or religious war, and marched for Kandahar, then held by British troops. After two severe reverses, in which the British lost over 1,000 men, Sir F. Roberts made the famous march to Kandahar with which his fame is permanently linked. Leaving Kabul on August 9th, he relieved Kandahar on the 31st, and the following day routed Ayub and captured his camp, artillery and baggage. Installing Abdul-Rahman Khan, who had been a pensioner of the British in Samarkand from 1870 to 1880, as Ameer, the British withdrew to the limits prescribed by the treaty of Gandamak.

The British troops were employed, before retiring from Afghanistan, to subject to the Ameer's control, in 1881, certain tribes who were proving refractory. A proposal by Russia, in 1882, to delimit the frontier of Afghanistan was received coldly in England. In July, 1884, however, a commission was appointed to demarcate the boundary between Afghanistan and the territory of the Turkomans. General Sir Peter Lumsden was nominated by the British government, and General Zelenoi by

the Russian. The line on which the commissioners were to be engaged was from Khoja Sakh, on the Oxus, to Sarakhs. But after the annexation of Merv and the preliminary surveys of M. Lessar in the valleys of the Khushk and Murghab, the Russian authorities took a different view. They contended that the Paropamisus was the true boundary of Herat, and that the district of Badghis, inhabited by Saryk Turkomans, who had proffered their allegiance to the Czar, lay outside Afghan territory. Questions of such grave moment, it was further stated, required to be settled by the two European governments before the commissioners could enter on their duties, and General Zelenoi was, without further explanation, sent to Tiflis. General Lumsden waited for him for four months on the Murghab, with an escort of 500 men, besides followers. In the mean while the Russian outposts were advanced so as to include part of the debatable land. By their occupation of Zulfikar, 50 miles south of Pul-i-Khatun, the outposts of the two nations were brought into immediate contact, and it was only through the urgent remonstrances of General Lumsden that a collision was avoided. Matters were further complicated by the attack on Pendjdeh, near the fork of the Khushk and Murghab rivers, by a force under the command of General Komaroff, on March 30, 1885, and by his seizure of this important strategical position. During 1886 the demarcation of the frontier was proceeded with, and in April, 1887, the British and Russian commissioners met at St. Petersburg. After somewhat protracted negotiations, an agreement was effected, resulting in a compromise of the points at issue, concessions having been made on both sides. Russia obtained the valleys south of Pendjdeh for nine or ten miles in the direction of Herat; on the other hand, the Ameer of Bokhara waived his claims to the pasture-lands on the left bank of the Amu Daria, south of Khoja Saleh. Russia now touches the northwestern frontier of Afghanistan, and has developed her railway communication in this direction with extraordinary rapidity. Meanwhile Great Britain fortified and garrisoned Quetta, in Beluchistan, on the southern frontier of Afghanistan, and connected it with India by a railway extended (1887) as far as Pishin.

In 1887, on the completion of the Sibi-Pishin railway, the two districts from which the line takes its name were formally annexed to the Indian empire. Under the leadership of Ishak Khan, a cousin to the Ameer, another formidable rebellion broke out in Turkestan in the winter of 1888–89. This was speedily suppressed by Abdul-Rahman's forces, on which he went in person to Turkestan to affirm his rule and discipline the insurrectionists. This was done with such cruel severity as to provoke an outcry from Russia and a menacing concentration of her army on that frontier, the Ameer on his part suspending all friendly relations with Muscovy. It was not until July, 1890, and after wreaking a terrible vengeance on his enemies, that Abdul-Rahman returned to his capital, his eldest son, Habibullah, having administered affairs at Kabul during the two years of his absence. At the same time the Ameer was again on good terms with Russia, and in 1891 much jealousy was aroused in England by the discovery that there was a Muscovite outpost on the Little Pamir tableland. This approach toward the Indian frontier was hotly resented, and the question again came up of an Anglo-Russian demarcation of the territory in the Pamir. From the British standpoint this implied a secure Afghan barrier between India and Russia, while the latter power seemed to be cajoling both China and Afghanistan into a consent to her progress in the coveted direction. Meanwhile, in August, 1892, the Ameer advanced an appeal for advice from the Indian government, on the ground that he "could no longer endure the hostile action of Russia." Russia, nevertheless, continued to strengthen her position in the Pamir until the line of demarcation was finally settled.

The subsequent history of Afghanistan has been one of wars and rumors of wars, varied with the ever-approaching Russian advance and requests for frontier delimitation. Waziristan and Chitral have been the scenes of victory for two expeditionary forces, and in each case the natural difficulties and defenses of the country were the principal obstacles to oppose the advance of the troops. Chitral, on the accession of Lord Salisbury to power, was permanently garrisoned by native Indian troops, and the "land of mirth and murder," as an observant officer once aptly termed these hills, is secure in a settled form of government. The commission for the delimitation of the Indo-Afghan boundary line has made recent and rapid progress, and the Ameer, as an evidence of his friendship, in 1895 sent his second son, the Shahzada Nasrulla Khan, on an extended visit to the English court. In the Pamirs, "The Roof of the World," the boundary question has again cropped up, in the face of the continuous advance of the Muscovite outposts, and after continued diplomatic discussion the boundary has been ascertained and marked by a joint commission. The advance of Afghanistan in the hands of its present ruler has been marked. His mint is under the control of an Englishman, and manufactories are rapidly springing up in the principal towns.

The trade routes of Afghanistan are as follows: From Persia by Mashad to Herat; from Bokhara by Merv to Herat; from Bokhara by Karchi, Balkh and Khulm to Kabul; from East Turkestan by Chitral to Jelalabad; from India by the Khyber and Abkhana roads to Kabul; from India by the Gumal Pass to Ghazni, and from India by the Bolan Pass and Sind-Pishin railway to Kandahar.

No accurate statistics of the trade between Afghanistan and India have yet been obtained. Probably only one sixth of the freight carried by the Sind-Pishin railway, amounting in value to Rx. 2,500,000 annually, can be classed as imports and exports between the two countries. The trade between the Kabul district and India during the past five years has been registered as follows:

| | 1891—Rx. | 1892—Rx. | 1893—Rx. | 1894—Rx. | 1895—Rx. |
|---|---|---|---|---|---|
| Imports from India | 459,870 | 653,639 | 610,500 | 405,200 | 270,575 |
| Exports to India | 208,600 | 218,120 | 220,850 | 188,800 | 152,791 |

Of the above imports, the principal articles are cotton goods, indigo, sugar and China leaf-tea.

The exports include horses, spices, assafœtida, fruits and nuts. The prohibitive duties on merchandise in transit levied by the Ameer do much to retard commerce between India and the country north of the Oxus.

AFRANCESADOS, a sobriquet applied to those Spaniards who gave their allegiance to the French and acknowledged Joseph Bonaparte as their king in 1808–13. Ferdinand VII took severe vengeance on the Afrancesados after his restoration.

*AFRICA, up to within the past few years, says the London *Times*, has hardly been needed by the rest of the world, except as a slave-market,— a land of barbarism, in which many of the native tribes carried on wars, of which the main object has been to take captives and sell them to the Semitic Arab dealers in slaves. The horrors of this bloody marketing of human beings gave occasion to European, chiefly British, interference, and, with this, exploration and colonization have slowly made Africa both known and sought, as a mass of lands needed for human progress, and promising to play a great part in the general economy of the world, as populations become organized, states are developed, industry is promoted, and civilization broadly planted.

A very recent authoritative estimate puts the value of the total commerce of Africa at £100,000,000, or $500,000,000, and pronounces this a miserable yield for 11,500,000 square miles. If, for instance, it is compared with South America, although large parts of it have been barely scratched, yet an area of 7,000,000 square miles in South America is carrying on a commerce valued at £160,000,000, or $800,000,000.

SOUTH AFRICA. Statistics show that the grand total of South African commerce amounts to £17,358,000, or $86,790,000. Something less than one third of the whole continent of Africa, lying south of an equatorial boundary, will give a region as large as all Europe, and it is within this southern region that there are rapidly developing interests, calculated to make Africa count as one of the continental homes of great states and of advancing civilization. There has already set in a development corresponding to the development of the great Southwest of the United States, and in all probability many of those who are now living will see a United States of South Africa coming into existence, and promising to rank with the great nations of the world.

NORTH AFRICA. In North Africa there is a total population of about 17,000,000, of whom not more than 400,000 can be reckoned as white. The combined trade of Egypt, Tripoli, Tunis, Algeria and Morocco amounts to about £40,000,000, or $200,000,000 annually. The total area of these North African states is 1,250,000 square miles, but of this a large part — great wedges of desert — is wholly unproductive. Egypt, for example, has an area of 400,000 square miles, while all that it produces is yielded by only about 13,000 square miles. In all the other African states along the Mediterranean there are great tracts of desert. The people of these states are fairly high in the scale of civilization. They till the soil industriously, they rear cattle, they are skilled in manufactures of a simple kind, they are keen traders, and they have many wants which Europe can supply. All these lands, in spite of the drawbacks of the desert regions, are capable of being developed far beyond their present yield, but they are not adapted in climate to become the home of European laborers, at least not those native to central and northern Europe. Eminent French engineers have proposed to create in the depressed area of the Sahara to the south of Algeria an inland sea, by cutting through a ridge, 13 miles across and 150 feet high, into a depression from which, by one or two smaller cuttings, other depressions will lead to the great basin, the area of which is about 3,100 square miles, with an average depth of 78 feet. The belief of the projectors of this scheme is that the lake thus created would greatly improve the rainfall for the Sahara.

PARTITION. It is within about a single generation that a great part of North Africa, and nearly the whole of South Africa, has been explored and taken nominal possession of by various European powers, for the most part without resort to conquest, and with such beneficial results as improved relations among tribes, cessation of chronic tribal warfare and of cannibalism, extinction of bloody rites connected either with ancestral worship or with witchcraft, and the gradual suppression of the slave-trade. The systematic work of South African research began with Livingstone's discovery of Lake Ngami in 1849.

The large chapter in the history of African research which ended with the death of Livingstone in 1873, with the explorations of Burton and Speke (1857–58), of Speke and Grant (1860–62), and of Baker (1869–73), prepared the way for H. M. Stanley's expedition of 1875–77, with results scarcely surpassed in the annals of geographical research. Stanley especially opened to knowledge, by this expedition, the immense basin of the Congo, a river second only to the Amazon in volume and extent of navigable waters, and affording, through tropical Africa, from Stanley Falls to Stanley Pool, nearly a thousand miles of navigable waterway, calculated to profoundly benefit the Bantu populations of this boundless region. Stanley's Emin Pasha relief expedition in 1887–89 proceeded up the Congo and its Aruwimi affluent, and thence through the equatorial lake region to Zanzibar.

The political conquest of Africa has already so far progressed (1896) that the whole of the southern, and nearly all of the northern, divisions of the continent are virtually European dependencies. To a very large extent the Arab power, carrying everywhere Mohammedanism and the slave-trade, and until recently threatening to overrun the whole continent, has been arrested, driven back, and to a large extent broken. The International Anti-Slavery Congress of Brussels pledged the civilized world to the repression of the slave-trade; and, through charters to powerful commercial associations granted by various European powers, provision has been made for running railways through the country, launching steamers on navigable inland waters, and opening in every direction lines of civilized trade and of humane development. The partition of the continent was practically completed by the conventions entered

* Copyright, 1896, by The Werner Company.

into by Great Britain with Germany, France, Italy, and Portugal, during the years 1890 and 1894. The areas and populations subject to the various European powers aggregate, according to such rough approximation as can be made: Great Britain, 2,818,000 square miles, with 39,852,000 population; France, 3,074,850 square miles, with 22,030,000 population; Portugal, 833,920 square miles, with 6,670,000 population; Germany, 823,000 square miles, with 5,720,000 population; Italy, 596,000 square miles, with 6,560,000 population; Spain, 263,000 square miles, with 825,000 population; the Congo Free State, under Belgium, 900,000 square miles, with 14,000,000 population; Turkey, 1,672,000 square miles, with 17,818,000 population. These European African possessions aggregate 10,948,850 square miles, with populations numbering 113,462,000. There remain, independent and unappropriated (Morocco, Wadai, and unknown regions), something over 1,000,000 square miles, with 25,000,000 population. The area credited to Great Britain includes 42,000 square miles of the Orange Free State, and 122,000 square miles of the Transvaal and Swaziland, over which British control is merely nominal; otherwise the British possessions embrace many of the best parts of the continent. An immense section of the French possessions is the West Sahara region of 1,500,000 square miles, from Algeria southward to Sokoto, but it is only a French sphere of influence, with a population of independent nomad tribes not exceeding 1,000,000. Italy actually holds no more than 4,000 square miles as a colony, with 392,000 square miles under a nominal protectorate, and 200,000 square miles of Abyssinia and connected lands, the 5,500,000 population of which has successfully repelled Italian military advance.

MAURETANIA. The northwestern section of Africa, between the desert and the Mediterranean, an upland region in the form of an irregular rectangle called the Mauretanian Quadrilateral, stretches from Capes Juby and Nun, opposite the Canary Islands, in the direction from southwest to northeast, for a distance of over 1,500 miles to Cape Bon, opposite Sicily. The highlands, plateaus, and border ranges, collectively forming the Atlas orographic system, have a mean breadth of nearly 200 miles, giving to the whole region a total area of about 450,000 square miles, with a population approximately estimated at from 10,000,000 to 11,000,000. It comprises three separate political divisions; the sultanate or empire of Morocco in the west, area 220,000 square miles, population about 5,000,000; the French colony of Algeria in the middle, area 184,000 square miles, population 3,910,000; and the French protectorate of Tunis, in the east, area 45,000 square miles, population (estimated) 1,500,000.

French engineers have in recent years carried out vastly improved methods of sinking wells to underground water, reached at a depth of from 100 to 250 feet, and have by this means transformed to green oases large tracts of the Algerian Sahara. There appears to be, practically, no limit to the quantity of water procurable by these wells. Much of the region extending from Biskara as far south as Tuggurt has been brought under cultivation and planted with date-palms; and due south from Tuggurt, along the Igharghar valley, or southwest along the course of the Miya, other extensive zones of productive land may be recovered from the sandy wastes, in one direction as far as the Ahaggar plateau, in another all the way to the Tuat oasis.

TURKISH AFRICA. The Turkish possessions in North Africa, west of Egypt, have remained untouched by the recent changes in the political map of the continent. They still comprise the whole region extending along the Mediterranean seaboard from Tunis nearly to the Siwah oasis, and reaching southward to the tropic of Cancer. They include the three somewhat distinct regions of Tripoli in the west, Barca in the east and Fezzan in the south, with the oases of Aujila and Kufarah in the east and of Ghat and Ghadames in the west. The entire region is a vast stony and sandy plateau, indistinguishable for the most part from the Sahara proper, and possessing, with an area of 400,000 square miles, a total population of not more than 1,000,000.

What are known as the Khwan (i. e., "brethren"), a semi-religious, semi-political body founded about fifty years ago by the Algerian sheik Senusi-el-Mejahiri, and, since his death in 1859, led on by his son, with headquarters at Jarabub, virtually rule the whole population of the Turkish possessions west of Egypt. It is an agency similar to that of the Nubian Mahdi in Egyptian Soudan.

SAHARA. The Sahara, or "desert" region of North Africa, extending from the Mediterranean seaboard in the north, southward to Soudan, and from the Red Sea westward to the Atlantic, is estimated by recent observers to have a total area of 3,500,000 square miles; but, deducting the many more favored parts of the Mediterranean seaboard, and the Lower Nile valley, where regularly recurring inundations take the place of a rainfall, the strictly desert lands are reduced to 2,386,000 square miles, with a scattered population of 1,400,000. France, in 1890, proclaimed the whole of the western Sahara, between Algeria and Senegambia, as within the sphere of French influence; but the region is one where the local Tuareg chiefs recognize no masters, and whence few European adventurers return to relate their experiences.

The central region of the Sahara, between the meridian of Baruwa and the Libyan Desert, is skirted on the west by a direct caravan route between Murzuk and Lake Chad, and traversed in the direction from northwest to southeast by the Tibesti highlands, the home of the fierce and indomitable Tibu nation. France has projected, although with remote prospects of realization, a railway, over 2,000 miles long, to connect her Algerian system with Timbuktu and St. Louis, on the Atlantic Ocean,—a scheme which requires bringing into subjection the fanatical Tuareg and Arab tribes of a vast wilderness region, as well as the construction of a line running for most of the distance through permanently unproductive sandy wastes,—a line, moreover, the trade of which, between Soudan and the Mediterranean, will have to compete with the traffic already developed by British enterprise along the far less costly ocean route between the Niger basin and England.

The central Sahara region has been very imperfectly explored. Between the various routes running north and south, everywhere remain vast spaces unvisited; in fact, the actual extent of the Sahara as yet even roughly surveyed hardly exceeds 200,000 square miles. Recent exploration fails to confirm the formerly prevalent notion of the marine origin of the Great Desert. Not only does the Sahara stand at a present mean altitude of over 1,400 feet above the surrounding waters, but there are unmistakable indications that within comparatively recent geological times it stood very much higher, probably as high as the southern section of the continent, say from 3,000 to 4,000 feet above the sea. This reduction of altitude is mainly due to atmospheric agencies affecting the change of temperature between day and night, and to the mechanical action of the wind violently driving the sands over the face of the rocks. Owing to the intense dryness of the air, and consequent rapid radiation of the heat from the burning surface of the ground after sunset, the temperature changes from over one hundred degrees Fahrenheit, to one or two degrees below freezing-point at night. This promotes rapid disintegration of the rocks. They are heated and expand under the fierce solar rays, and are then broken up by the sudden shrinkage caused by the cold at night. The disintegrated particles, violently driven by the wind, also have a wearing effect upon all the exposed rocky surfaces. It is estimated that the mean altitude of the desert plateau has been lowered probably 1,500 feet during and since Quaternary times. The rocks of the region appear to have been of sedimentary freshwater origin. They show not only extreme fineness, but a mixture of many clay particles, and, unlike seashore sands, they are very fertile wherever sufficient water can be obtained. In the Tuggurt district, on the northern verge of the desert, and also elsewhere, the sinking of numerous artesian wells has already brought extensive tracts under cultivation, and in some places the palm groves have largely encroached on the surrounding wastes. In many districts, however, the disintegrated fragments of stone, not yet reduced to a fine powder, give a hard, shingly surface, with no possibility, for ages to come, but of absolute sterility.

The Sahara is nowhere a vast level plain strewn with sands; the general level is frequently broken by mountain masses and ranges of moderate elevation, or by deep, although now dry, river valleys and depressions of all kinds, below which, at no great depth, abundant water may frequently be found. It is roughly estimated that the actual extent of fine sand is less than one half, or even less than one third, of the entire Sahara surface. In whatever direction the Sahara is approached, the traveler has to ascend, not descend. It never was a marine basin capable of being transformed again to an inland sea by a series of engineering operations; it is rather an elevated plateau which stands at a mean altitude of from 2,100 to 1,400 feet, nowhere falling to, or below, sea-level except in the Siwah district, on its extreme northeastern verge, and in the Shott Melrhir basin, south of Algeria. A feature of the Sahara are the sand-dunes, disposed in long parallel, or nearly parallel, ridges, varying in height from 50 to 400, or even 500, feet. Their appearance is that of continual drifting and shifting, and of sand-storms sufficient to swallow up whole caravans, but this, even in the fiercest wind-storms, is an appearance only. The sand-hills are determined by moisture coming up from below, making the sand wet and heavy, and from year to year they are very little changed, although the surface dry sand may be in continual commotion. This view of the sand-hill regions becomes a guide to the sinking of wells, and proves that they are not absolutely irreclaimable.

Despite the generally desolate character of the Sahara, some important centers of trade and population occur, both on the northern and southern margin, and even in one or two central parts of the western region of interminable sand-hills. Such are, as we go from northeast to southwest, the towns and oases of Tuggurt, Wargla, Gardaia, Metlili, El-Golea, and in the extreme southwest, the Tuat oasis, including the flourishing settlements of Tidikelt, with its capital, In-Salah, in the Wad Saura basin. The eastern region of dunes, or sand-hills, although now absolutely uninhabitable, shows numerous buried prehistoric stations, known to the Arabs. Ahaggar, or Hoggar, occupying very nearly the geometric center of the Sahara, viewed as a whole, consists of a series of superimposed plateaus rising in terraces from 1,600 to over 6,500 feet. The circular central mass which forms its base has a circuit of over 370 miles. Its highest crest, with the twin peaks Hikena and Watellen, wears a mantle of snow in winter.

The western Sahara corresponds, in the absence of high ranges, prominent mountain masses, and extensive habitable tracts, to the still more arid and monotonous Libyan Desert, in the extreme east. The line dividing it from the central Sahara coincides with the now dried-up valley of the Messaura. The whole region west of this valley, some 800 square miles in superficial area, consists almost exclusively of interminable sand-hills, or sand-wastes, traversed here and there by low, rocky ridges, sinking in the central parts to the great El-Juf depression, and attaining in the Aderer Heights a moderate elevation of 1,800 or 2,000 feet. There are no groups of oases on the trade routes through it between Morocco and Timbuktu, and but for the wells occurring along the line of march at greater or less intervals, travel would be impossible.

Negro populations and rule formerly extended over the greater part of the Sahara, and at some points even approached the Mediterranean seaboard, but for 300 years no negro people has held political power, and in many districts the primitive negro populations have disappeared, while in others they still persist, and have been added to by importations of slaves from the Soudan. The dominant tribes everywhere are Mohammedan, of either Hamitic or Semitic stock. The Hamites comprise the Tibus in the extreme east, and Tuaregs (Berbers) in the central and western regions. The Semites, mainly confined to the western Sahara, are all intruding nomads of Arab descent. What are termed Moors

are Tuaregs with whom a dominant Arab element has been mixed.

In the whole of the Sahara proper there is not a single carriage-road, scarcely even any beaten tracks, not a mile of navigable waters, not a wheeled vehicle, nor canoe or boat of any kind. Most of the routes, though followed for ages without divergence to right or left, are temporarily effaced, so far as surface-marks are concerned, with every sand-storm, and are followed only by means of such permanent land-marks as wells, notable dunes, a solitary eminence showing a single bush, or perhaps lines of bleached bones, the remains of travelers. Caravans usually comprise hundreds, or even thousands, of men and pack-animals, all under command of a guide, whose authority is like that of a pilot at sea. Nearly all the more frequented routes run north and south between the Mediterranean seaboard and Soudan, a few obliquely from northeast to southwest. The Saharan routes are tedious and costly, compared with the ocean highway, by which the very heart of the black zone can now be reached in a few weeks from Liverpool or London; hence the general transit traffic across the Sahara has greatly fallen off.

SOUDAN. The expression, *Bilad-es-Sudan* (land of the blacks), was applied by the Arabs to the whole region south of the Sahara. It has been worn down by use to the single word *Soudan*. To the Arabs all Africa south of the Sahara was a negro-land, but exploration has disclosed a broad distinction between the people of a black zone with endless varieties of speech, and the people of the rest of the continent to the south, who almost universally speak more or less closely related dialects of the Bantu stock language. The parting-line between the two classes of people coincides roughly with the parting-line between the southern elevated section of the continent and the relatively low northern section. This line runs east from the head of the Gulf of Guinea, forming the natural southern limit of Soudan, or negroland. The black zone, extending from this southern limit northward to about the parallel of Khartoum, reaches from the foot of the Abyssinian highlands in the east, west to the Atlantic, having an extreme length of somewhat over 3,500 miles and a mean breadth of 600 miles. The total area is at least 2,000,000 square miles, and the population is approximately estimated at about 80,000,000.

Except where seaboard factories, fortified stations, and even colonies,—Portuguese, French, English, German, Danish, and Dutch,—had been founded at various points between the Senegal and the Niger delta, no part of the black zone was reached by European influences till the present century. Egypt began, about the year 1840, the reduction of regions on the White Nile, beyond Nubia. A very extended region had been occupied, and preparations were being made for further conquest, when the revolt of the Mahdi in 1882 dispossessed Egypt in the Soudan everywhere except in the equatorial province held by Emin Pasha, and since 1884 the Soudan provinces have been practically abandoned. From 1879 to 1883, England and France jointly intervened to direct financial matters in Egypt. In the summer of 1882 England alone undertook military intervention to suppress the revolt of Arabi Pasha and restore settled government. This gave England practical control of Egypt and led to the recognition of the eastern Soudan provinces as belonging within the sphere of British influence. It is in the assertion of this influence that an English-Egyptian military expedition entered, early in 1896, upon a movement looking to the partial or entire conquest of Egyptian Soudan. Comprising the whole of East Soudan and Nubia, between Wadai on the west and the Red Sea on the east, together with the northwest section of Somaliland and the coast-lands between Abyssinia and the Gulf of Aden. With an extent from the frontier of Upper Egypt for a distance of nearly 1,400 miles southward, to Lake Albert Nyanza, the total area of Egyptian Soudan is nearly 1,000,000 square miles, with a population roughly estimated at from 10,000,000 to 12,000,000. Before the Mahdist revolt it was divided into twelve provinces. It is estimated that three fifths of the population have, during the last 10 years, perished through war, famine, and slave-trading.

The greater part of the vast region comprised between the Niger and the Atlantic is now virtually French territory, under the name of French Soudan. Since the year 1880, France has vigorously pushed both conquest and aggressive commercial activity, with a view to supremacy throughout the whole of the Niger basin. By the overthrow of Behanzin, king of Dahomey, in January, 1893, and of the Mohammedan chief Samory, in the Upper Niger region, inland from Sierra Leone, in March, 1893, the French have nearly completed a cordon of military stations, sweeping round from the Slave Coast to Senegambia, thus effectually forming a barrier to the inland expansion of all the other European settlements on the Guinea seaboard. The old British colonies of Gambia, Sierra Leone, and the Gold Coast are shut up within the French domain. It is, however, done only at the cost of a heavy yearly outlay, and with very little prospect of practical developments of any value. The French Soudanese possessions embrace 591,000 square miles, with a population of 11,200,000. French Soudan proper has an area of 530,000 square miles, with a population of 10,500,000.

The British territories in West and Central Soudan aggregate 568,000 square miles, with a population of 37,140,000. They include the following: Gambia, a narrow district on both sides of the river of that name, extending inland a considerable distance, and shut in on both sides by French Soudan, area 2,700 sq. miles, pop. 50,000; Sierra Leone, between French Guinea and Liberia, area 15,000 sq. miles, pop. 180,000; the Gold Coast, with Ashanti, area 20,300 sq. miles, pop. 1,910,000; Lagos, with Yorubaland, area 30,000 sq. miles, pop. 5,000,000; and Niger-Binue, with Oil River, area 500,000 sq. miles, pop. 30,000,000. In the vast region stretching from the coast between Dahomey to the German Cameroons, and extending up the Niger to the Sahara and up the Binue, the great eastern branch of the Niger, to the basin of Lake Chad, the administration of British interests is in

the hands of the Royal Niger Company, chartered in 1886.

Germany has secured possession of but a small fragment of the Soudan,—the colony of Togoland, on the Slave Coast, between Dahomey and Ashanti, with a shore-line of 37 miles, an area of 16,000 square miles and a population estimated at 500,000. Its occupation as a German protectorate dates from 1884.

The Portuguese, by whom the whole seaboard was discovered, and whose flag was hoisted in token of possession in 1482, retain nothing of West Soudan except the mainland between the Cacheo and Rio Grande rivers, known as Portuguese Guinea, and the Bissagos archipelago, off the coast, a territory having an area of 14,000 square miles, and a population of 150,000. Not more than 30 square miles, and hardly any more than 10,000 of the inhabitants, are actually under Portuguese authority, and the small trade of the colony is almost wholly in the hands of French merchants. French territory entirely shuts it in, except for the few miles of coast. Portugal, with her possession on these shores for more than 400 years, has made no attempt to explore the interior, not even to reach the ancient city of Jinni, or Guinni, in the Joliba or Upper Niger basin, from which the kings of Portugal took the title of Lords of Guinea.

Between the British colony of Sierra Leone on the north and the French possessions on the Ivory Coast, lies the negro American state of Liberia. It extends along the Grain or Pepper Coast from northwest to southeast, and inland about 200 miles. It has an area of over 14,000 square miles and a population of 1,000,000, about 20,000 of whom are the dominant English-speaking class, descendants of the freedmen removed since 1820 from the United States to this region by the American Colonization Society. The emancipated slaves have made scarcely any advance in general culture, and have done nothing to improve the moral status of the surrounding pagan populations. Neither have they developed the resources of the country. The whole trade of the republic, imports and exports combined, amounts to about $2,500,000.

In the region around the Lake Chad basin, the two independent Mohammedan sultanates of Bornu and of Wadai rank next to Morocco as self-governed African states. Wadai has extended its supremacy over two other native states, Kanem and Baghirmi. Bornu has an area of 56,000 square miles, with a population of 5,000,000; Wadai, 180,000 sq. miles, pop. 2,500,000; Baghirmi, 70,000 sq. miles, pop. 1,500,000; Kanem, 34,000 sq. miles, pop. 150,000.

Of more recent explorations in West and West-Central Soudan, the expedition of Captain Binger, in 1887–89, from the Upper Niger to the Gulf of Guinea, had most important geographical, political and commercial results. Binger reached the famous town of Kong, Feb. 20, 1888. He found that where the Kong Mountains, a huge mountain mass, had been figured on our maps since the time of Mungo Park, there exist only rising grounds of moderate elevation, forming the divide between the Niger system and the coast streams which flow south toward the Gulf of Guinea. Binger's expedition, making a complete circuit round the hitherto unvisited region back of the Gold Coast, brought under French protection and open to French commerce the whole vast territory extending from the Senegal to the Ivory Coast. French military power in 1890–91 brought into subjection the Mohammedan chiefs in the Upper Senegal and Joliba basins, and the occupation of Timbuktu, early in 1894, completed the French conquest of West Soudan.

In East and East-Central Soudan, Dr. Schweinfurth's work (1870–72) was especially completed by that of Dr. W. Junker, whose 11 years devoted to exploration (1875–86) filled up one of the large blank spaces, that of the water-parting between the Nile and the Congo systems, which till then existed on the map of Africa. In 1889 Major C. M. Macdonald, British commissioner to the Oil Rivers, ascended the Benue, the large eastern branch of the Niger, a distance of 600 miles, and thence followed the course of the Kebbi to a shallow lagoon within a few miles of the water-shed that divides the basin of the Niger from that of Lake Chad.

In 1891 M. J. Dybowski, sent out by the French government, crossed the chain of iron-bearing rocks forming the divide between the basin of the Congo and the Lake Chad basin. He was followed, in 1892–93, by the French political agent, Maistre, who put the keystone to the work of exploration in the interior of the continent, by filling up the last space which still separated the routes of travelers up the Nile from those leading from the Congo basin northward to the headwaters of the Nile. French activity in this region has contemplated establishing a cordon of stations from their Congo possessions, by the way of Baghirmi, to Lake Chad for the purpose of arresting the further advance of British enterprise in the Chad basin.

SOUDANESE. The Soudanese populations fall under three general heads: Semitic Arabs, Hamites pure and mixed, Tibus, Tuaregs and Fulahs and negroes pure and mixed. Throughout the entire black zone the negro variety of mankind everywhere constitutes the distinct aboriginal element, in many places exclusively, in others associated or intermingled with Hamitic Berbers and Semitic Arabs from the north and east. Pure or almost pure negro populations prevail throughout the Senegambian and Guinea Coast lands; along the banks of the Lower Niger and of the Binue, its great eastern branch; in the Oil Rivers district east of the delta of the Niger; in all the southern parts of the Chad basin; in many parts of Wadai, Darfur and South Kordofan (Dar-Nuba); in the Upper Nile region as far south as about 3° N. lat.; everywhere along the Congo-Chad and Congo-Nile divides; and in the Welle-Makua basin. Pure or nearly pure Hamites (Tibus and Tuaregs) are found chiefly in the northern districts of Senegambia, within the Niger bend as far south as 15° N. lat., around the northwest shores of Lake Chad, and on the northwest frontiers of Darfur. Pure or nearly pure Semites (Arabs) are mainly confined to the

northeast and east shore of Lake Chad, to parts of Wadai, Darfur and Kordofan, and to both banks of the White Nile between the Sobat and Atbara confluences. Lastly, mixed negroid populations, which greatly outnumber all the rest, and which consist mainly of negro and Hamite elements, occupy nearly all the central regions between Lake Chad and Senegambia.

In general, the pure negroes are fetish and nature worshipers, speaking an immense number of distinct languages, and occupying a low stage of culture, little removed from the savage state. To some extent they have founded powerful political communities, but for the most part political organization among them has not passed beyond the tribal state. The nation, as distinct from the tribe, has nowhere been developed in pure negroland.

The pure Hamites and Semites, though widespread in Soudan, are not numerous. They are all Mohammedans, for the most part of a fanatical type, speaking only four distinct languages (Fulah, Tamashek, Tibu and Arabic), and possessing sufficient culture to be regarded as semi-civilized. Intermediate between these and the fetish-worshiping negro are the mixed negroid peoples. They are little more than nominally Mohammedans, indifferent to the progress of Islam, and to some extent amenable to Christian and European influences. Under their Mohammedan guides these negroid populations have founded large and rudely organized states, in which the tribal groups have in many places been merged in the nation, and which have reached a considerable degree of culture. The mediæval Songhay, Ghana and Melle empires attained political and social conditions, reflecting not a little barbaric splendor. The same conditions prevail in the negroid kingdoms that have not yet lost their independence,— Bornu, Baghirmi and Wadai. In the opinion of the latest observers, the future of the Soudan is bound up with the mixed negroid peoples. They are of industrious and peaceful habits. They possess natural intelligence and the commercial spirit, and under wise European control they will be found capable of indefinite material and moral progress. The pure negro element is of too low a grade of intelligence, and is too inactive and indolent, to give any promise of advancement or elevation, while the pure Hamitic and Semitic elements are slaves to a blind religious fanaticism.

As a rule, the inhabitants of the coast lands, and generally of the southern fringe of the black zone, stand at a much lower grade of culture than those of the interior. In the inland regions, the peoples have been merged in powerful communities, speaking a few widely diffused languages, while the coast populations have almost everywhere remained in the tribal state, each little group speaking a language unintelligible to its neighbor.

The Soudanese Arabs have hardly any communities in the west, and very few in the center, but in the east of Soudan (Egyptian Soudan) they are the dominant people. The Jalins of Khartoum and surrounding districts are the most numerous, influential, and purest of all the Soudanese Arabs. They are great traders and notorious slave-hunters. The Kababish ("goat-herds") and Bakkara ("cow-herds") Arabs are essentially pastoral peoples, the latter owning numerous herds of cattle, and the former being large breeders of horses and camels as well as of goats. Both of these tribes are a peaceful people, who could be counted on against the Mahdists, if advantage was properly taken of their friendly disposition. The trading and slave-hunting Arabs are essentially the disturbing element in Egyptian Soudan. Proud, ignorant, bigoted and insolent, considering it a disgrace to practice any manual labor, for the most part nomads or wanderers, large owners of cattle, camels, horses and slaves, leaving their women to cultivate corn sufficient for the wants of the tribe, they are essentially hunters, robbers and warriors, devoting all their energies, after caring for their cattle, to slave-hunting and war. An even still lower element is formed by those Arabs who have given up the tribal relations and enlisted in whatever work of murder and rapine they could find.

Fulahs. Among the Soudanese Hamites the Fulahs hold in the west a position somewhat similar to that of the Arabs in the east. They are conquerors, and preachers of Islam, but they are a new people, who were scarcely heard of till quite recent times. Until the opening of the present century they were despised and persecuted herdsmen, scattered in small pastoral communities from Senegambia to Darfur, except that of the single instance of the independent principality of Suladugu. A Fulah religious teacher, Othman dan Fodiye, in a state ruled by a pagan prince, the northern Hausa state of Gober, was rebuked by the prince for his excessive zeal in preaching Moslem doctrine, and in reply raised a standard of revolt in 1802, round which the Mohammedan Fulahs rallied from all quarters. After a period of reverses the revolt became successful, and Othman rapidly overran the greater part of Soudan, until he had established an empire called Sokoto, and extending from the Niger to the frontiers of Bornu. At the death, in 1817, of Othman, the larger eastern division of his empire fell to his son, Bello, and the western provinces to his brother, Abd-Allahi, under the name of the Empire of Gando. By treaties with these potentates, Great Britain, in 1885, established a protectorate over West-Central Soudan.

In French Soudan the Wolofs in the north are the blackest known negroes, although their features are negroid, rather than pure negro, and are often described as almost regular. The remotely allied Serers in the south are the tallest members of the negro race, many exceeding six feet four inches in height. They are also noted for their great muscular development, pronounced negro features, and herculean frames, which, however, as is usual with Africans, fall off in the lower extremities. The bulk of the Serers are still pagans, believing in the transmigration of souls, holding snakes in great veneration, and worshiping two powerful deities, Takhar ("god of justice") and Tuirakh ("god of wealth"). Most of the Wolofs claim to be Mohammedans, while some about the stations call themselves Christians.

In British Gambia the substratum of the population belongs to the widespread Mandingan race.

They are Mohammedans of a mild type, remarkably intelligent, industrious and enterprising. The type is distinctly negro. All are excellent husbandmen and enterprising traders.

The most powerful of the rude negro tribes of the coast-lands south of Gambia are the Timni of Sierra Leone. Most of them are still pagans, but they form an industrious peasantry, from whose well-tilled fields the English colony draws most of its supplies. Sierra Leone, which was in the eighteenth century (1713–87) a depot for slaves supplied by an English company to the Spanish-American plantations, and which became, after 1787, a free settlement for emancipated blacks, either brought hither from America or rescued on the coast from slavers, is now a hybrid community with a certain degree of culture, shown by skill in the mechanical arts, by general profession of some form of Protestant Christianity, and by the regular attendance of the children at school. Both this community and the state of Liberia, which lies to the south of Sierra Leone, leave the impression that the negro is not capable of rising to the general level of European culture.

The Ivory Coast natives are pure negro tribes of a very low grade of culture, with some extremely repulsive customs. They are generally eager traders, and, although still pagans, sometimes show proverbial honesty.

The Gold Coast natives, numbering collectively many millions, form fundamentally one great ethnical and linguistic division of the negro race, with three sub-groups which show a gradual advance in civilization from their situation at a greater or less distance from the coast. British occupation of Kumassi in 1874 not only shattered the Ashanti military power, but put an end to indescribable bloody horrors of negro custom. Kumassi is a large place, with a reputed population of 70,000 to 100,000. It is well laid out, with broad, open streets, shaded with trees and flanked by continuous lines of huts. It has a circuit of nearly four miles, not including the sacred suburb of Bantana and the royal quarter of Assafu.

The Slave Coast natives are full-blood negro peoples, who in early life display a degree of intelligence fully equal to that of European children, yet become later so deadened in intellect as to sink to the lowest level of heathen brutalism. The kingdom of Dahomey, until the overthrow of native power in 1892–93, was the scene of nameless bloody horrors almost impossible to conceive of human beings perpetrating.

YORUBALAND. The natives of Yorubaland have made considerable progress in the industrial arts and in general culture under Mohammedan and Christian influences, the former penetrating from the north and the latter from the coast. Mission stations have been founded in nearly all the great centers of population, and the labors of the Christian propagandists have been more successful in Yorubaland than in any other part of Soudan. Intertribal and foreign wars have been permanently checked by the British protectorate established in 1893, and by the French overthrow of the kingdom of Dahomey. There are many large cities, walled towns, within which the people have grouped themselves for defense against the incessant slave-hunting expeditions, to which a stop has been recently put. The Yoruba people are favorably distinguished by their naturally peaceful disposition, industrious habits, and friendliness toward strangers. The physical type is negroid rather than decidedly negro. Mental superiority is shown by agricultural skill and by marked progress in the mechanic arts. While agriculture is the chief industry, weaving, dyeing, pottery, tanning and forging are practiced in all the large towns. The people make their own agricultural implements, and as builders are unrivaled in negroland. The spacious dwellings of the chiefs, often containing 40 or 50 rooms, are constructed with rare skill and tastefully embellished with wood-carvings. The Bible and numerous other religious works have been translated into Yoruba. Lagos, the chief seat of British authority, and the commercial center of the whole region, has in recent times become the most important place on the West African seaboard. It trades directly with Liverpool, and is a port of call for all steamers plying on the West Coast of Africa.

The vast plateau region within the Niger bend north of Upper Guinea, is occupied by groups of people living in small tribal communities at a very low level of culture, that of the merest savages, and constantly subject to the visitation of marauders, who will often destroy a whole community in securing a few captives, to be carried away as slaves.

MOSSI, a part of Yorubaland, lying mainly between lat. 11° to 13° N. and long. 2° to 5° W., has never yet been traversed by any European. It is still one of the few remaining independent native states of Africa, although lying diplomatically within the French sphere of influence. It has great agricultural resources, but the arts are in a backward state, being mainly limited to a little coarse weaving, tinkering and rude copper, iron, and silver work. It has very little trade, and seems altogether to be in a state of rapid decline.

KONG STATE. The Kong State, a confederacy of petty states, of which the commercial center is the city of Kong, lies entirely within the French sphere, but does not recognize a definite French protectorate. It has been for 200 years ruled by Mohammedan princes of the South Mandingan Wattara family. Although Mohammedan, they have been extremely tolerant, practically accepting as identical the three religions, of Moses, Jesus and Mohammed, on the ground that "all lead to the same God." The people are industrious and peace-loving, with an instinctive horror of war.

CHAD BASIN PEOPLE. The dominant races in the basin of Lake Chad are the Kanuri of the kingdom of Bornu, and the Mabas, who rule Wadai, and with it Kanem in the northwest, and Baghirmi in the southwest. The Kanuri are of mixed negro and Tibu descent, but of a much coarser type than most other negroid Soudanese peoples. Barth noted them as having broad faces, wide nostrils and large bones, of melancholic, dejected and brutal disposition, and, their women especially, amongst the ugliest in all negroland. The great bulk of the people have been Mohammedans since the second half of the ninth

century. Their culture, strange and even barbaric as it seems, is an immense advance on the average standard which has anywhere been reached by full-blood negro populations, such as those of Ashanti or Dahomey. They are of industrious habits, tillers of the land, skilled in many mechanical arts, and very far from the savage condition, although still addicted to many barbarous practices. They have developed a fully organized political administration, a royal court and government, with all proper dignities and offices, and a military system which, for Central Africa, may be considered fairly well worked out. A note of their barbarism appears in the fact that the whole policy of the state is still based on slavery, the supply of captives being kept up by organized expeditions to the pagan lands in the south, and the slave-trade still flourishing vigorously, especially across the desert northward to Fezzan and Tripoli. The center of the slave-trade is Kuka, the present capital of Bornu. It is also one of the great markets of Central Africa for cattle, sheep, poultry, goats, asses, ivory, leather, skins of lions and leopards, ostrich feathers, indigo, wheat, corn and fruits, and butter, milk and eggs. Wealth derived from the lucrative slave-trade has made Bornu the most powerful of all the native states in Soudan. The head of the state is the Mai, with wholly despotic authority, and held to be infallible in all his decisions. Next to him is the Digma, the head of a ministry. Besides the dominant Kanuri, there are many other tribes, the great bulk of which are still pagans, and are treated by the government as subject to being seized and sold into slavery.

Baghirmi–Wadai. Southeast of Bornu a low-lying, sandy and swampy region, watered by the Logon-Shari, is occupied by the ancient sultanate of Baghirmi, founded about the year 1520, and brought into subjection to the Sultan of Wadai in 1871. The natives are all of pure negro type. All the hard work is done by the women, whose costume is a mere strip of skin around the loins. Wadai, although a strong sultanate, well administered, is much lower in culture than Bornu, or even its dependency, Baghirmi. The people are fierce, quarrelsome and cruel, especially under the influence of the intoxicant melissa (durra beer), the abuse of which is universal. Sheik Aly, who succeeded to the throne in 1858, greatly encouraged agriculture and the industrial arts, maintained a rule both wise and severe, and promoted the wide diffusion of Mohammedan culture. His son, Mohammed Sherif, is the present ruler of an empire estimated at about 170,000 square miles in extent, with a settled and nomad population of 2,600,000. His power is absolute, limited only by custom and the precepts of the Koran. He has a standing army of about 7,000, which is employed chiefly in securing his tribute from vassal states.

Welle-Makua Basin. A great but somewhat heterogeneous division of the negro family are the Bandas of Dar Bandar, which region extends across the Congo-Chad water-parting, and the Welle-Makua peoples, occupying the whole of the Welle-Makua basin, between the Nile-Congo and Congo-Chad water-parting in the north and the northeastern affluents of the Congo in the south. The region has been the theater of tremendous social and political convulsions, intertribal warfare and slave-raiding expeditions, migratory movements either peaceful or aggressive, and other disturbances involving dislocations and dispersions of tribes in all directions. Great physical differences appear in the natives, especially the endless gradations of color, from deep black to yellow-brown, although black, woolly hair, the most certain characteristic of the negro, is common to all. The social conditions present every shade of transition, from the lowest savage and hunting tribes to highly organized native states, with oral records and dynastic genealogies going back several generations. Before slave-hunting and other "civilized" intrusion had reached them, two powerful empires had been developed, the Mombuttu, about the head-waters of the Welle, and the Zandeh, along the middle course of that river and on its northern affluents. These had a culture shown in well-developed political organization, ingenious architecture, and marked progress in agriculture, pottery, wood-carving, metal-work, and other industrial arts; yet they were savages at heart, and amongst the worst cannibals in the whole of Africa. The complete destruction of these states, due to intrusion from the south, has been followed by the introduction, from the Congo Free State on the west, of influences, under Belgian direction, which promise to establish permanent order, to keep out the Arab slavers, and to suppress cannibal orgies.

Darfur. Eastward from Wadai lies Darfur, which was an independent state until its conquest by the Egyptians in 1875. It had an area of some 180,000 square miles and a population of not less than 4,000,000. It fell, with the rest of East Soudan, into the hands of the Mahdi in 1884. What little recent information there is appears to show that it has recovered its independence and re-established its ancient monarchy.

The loss of East Soudan to Egypt was due to two almost simultaneous revolts against the oppressive, corrupt and irresponsible rule of the Khedive of Egypt. One of these was that of native negro tribes in the White Nile provinces; the other was that of Mohammedan fanatics, led by the Mahdi, in the Kordofan and Nubian provinces. Mohammed Ahmed, a retired Egyptian official and an active slave-trader, raised the standard of revolt in 1881. He claimed to be the Mahdi ("guided"), a sort of Mohammedan Messiah, last of the 12 Imams ("leaders"), destined to convert all unbelievers or else to utterly destroy them. An attempted military revolt of Arabi Pasha occasioned the armed intervention of England to put down Arabi and preserve the Khedive's government. English bombardment of the Alexandrian forts (July, 1882) and the complete defeat of Arabi in the battle of Tel-el-Kebir (Sept. 13, 1882), established Great Britain in control of Egyptian administration, but was without effect in the Soudan. The Mahdi, in December, 1883, completely destroyed an Egyptian army of 11,000 men at Kashgil, under General Hicks, and again, in February, 1884, routed another Egyptian force under Baker Pasha. Before the close of 1884 the Mahdists had reduced the province of Bahr-el-Ghazal, and had

captured Khartoum and put to death the British commander there, the famous Gordon, just as a British force was approaching for his rescue (January, 1885). All the eastern regions beyond the Nile the Mahdists now rapidly overran, capturing and massacring the Egyptian garrisons. Egypt, under the advice of Great Britain, now retreated from all its Soudanese and Nubian possessions to Wady-Halfa, near the frontier of Upper Egypt. Emin Pasha, governor of the equatorial province for Egypt, was compelled, in the spring of 1887, to retire from Lado to Wadelai, near Lake Albert. Later, he withdrew to the coast, with the Stanley relief expedition (1889).

Upon the death of Mohammed Ahmed, June 22, 1885, his successor, Khalifa Abdullah, claimed to be a Mahdi, but without much reality of power. Three fifths of the whole population are said to have perished in the 10 years from 1882 to 1892, and many tribes, crushed and plundered by the notorious Arab slave-hunters who hold Khartoum, and who are the real power behind the Mahdi, are ready to welcome any deliverance. Before the Mahdist revolt, Egyptian Soudan was a vast domain comprising 12 administrative provinces, with an aggregate area of 950,000 square miles and a population estimated at 10,400,000. Khartoum was the largest and most flourishing place in the whole of Northeast Africa, south of Cairo. It was the headquarters of Christian missionaries, the starting-point of all travelers proceeding by the Nile route to the interior, and the residence of a large European community, consuls and vice-consuls, many of whom perished with Gordon during the horrors that followed its capture by the Mahdists. The present Mahdi has removed his capital across the White Nile to Omdurman, a natural converging-point, on the west bank of the Nile, of nearly all the caravan routes, through which a considerable export trade had been developed with Egypt before the war. The present Mahdi is said to be anxious to revive this trade, and secure thereby recognition of his government. The fanatical dervishes in whose hands he is do not wish relations with any deniers of faith in the Mahdi.

ZAREBALAND. In the lands west of the Upper Nile, known as the zareba-lands, from the zarebas or fenced trading-stations established by the Arab slave-hunters, there dwell a multiplicity of savage tribes, all alike of distinctly negro type, but often presenting surprising differences in speech, usages and complexion (reddish in the ferruginous districts, elsewhere black or brown). The Shilluks on the left bank of the White Nile, north of the Sobat confluence, are a warlike race of nearly jet-black negroes; a race noted for their tall stature, splendid physique, and martial bearing. At one time numbering over a million, and forming a great and warlike nation, they have been almost destroyed by slave-hunting, wars, famine and epidemics.

DINKAS. The Dinkas, numbering 2,000,000, but with a very large number of subdivisions, formed the largest of all the negro nations on the Nile. Their domain lies partly on the opposite side of the White Nile from the Shilluks, and partly about its lower course. They are great stock-breeders, and, besides sheep and goats, possess the very finest breed of cattle in all Africa. The Dinka ox, which is of the zebu humped type, is noted for its great size and huge horns, but vast numbers, both of people and of cattle, have perished during the recent troubles, converting many thickly peopled agricultural districts into solitudes tenanted chiefly by wild beasts, and where once a continuous village extended a considerable distance along the west bank of the White Nile, interrupted only by brief intervals, the land has now mostly reverted to a state of nature.

BONGO OR DOR. Among the tribes farther south (up the Nile), the Bongos and Mittus have a brick-red or earthy red-brown complexion, quite in contrast with the deep black color of the Shilluks and Dinkas. The Bongos live partly by cattle-breeding, fishing and hunting, but mainly on the produce of the soil. They bestow the greatest care upon the construction of their cone-shaped houses.

ERITREA. In the first rough partition of the African continent, the smallest and apparently least valuable slice, little more than the hot sandy district of Massowah, with the adjacent islands in the Red Sea, the Dhalak archipelago, fell to Italy. Massowa, however, is by far the most commodious harbor on the African side of the Red Sea, and, lying at the very nearest point to the Abyssinian tableland, it is the great seaward outlet for the produce of the Ethiopian highlands. The great natural resources of these uplands have remained dormant, and their foreign trade undeveloped, largely because Massowa has been in Mohammedan hands, hostile to the nominally Christian populations of Abyssinia. The famous seaport had been converted by Mohammedanism into a barrier, preventing the inland peoples from having commercial relations with the outer world. To Italian interests it was necessary to reverse this, and to accomplish as much as possible in the way of communications with the productive inland region. The Italian flag was first hoisted at the stations of Beilul and Gabbi, Jan. 2, 1885, and the settlement rapidly expanded into the spacious colony of Eritrea, with a coast-line on the Red Sea for about 550 miles, and extending back to the foothills which form the border of the Abyssinian highlands. The nominal protectorate, as yet of no force on account of Abyssinia, extends west and south across Abyssinia and southeast to the Indian Ocean, with a very long extent of coast on that ocean. A small French possession opposite the southern entrance to the Red Sea, and the British possession extending beyond that for about three quarters of the length of the Gulf of Aden, are shut in by these Italian lines. By agreement between Great Britain and Italy, March, 1891, all of the seaboard on the Indian Ocean, from the Juba River northeast, was recognized as Italian, but of the vast domain thus partitioned to Italy as against other European claimants, an Italian administration has been established in that section only, lying on the Red Sea, which is designated as Eritrea.

ABYSSINIAN PROTECTORATE. Military proceedings on the part of Italy for the assertion of a protectorate over Abyssinia have been disastrously repulsed by Menelek, emperor of Abyssinia. After the death of Theodore at Magdala in 1868, the

British had recognized Emperor Johannes as Negus Negust ("king of kings"). The Italians came into conflict with him by the occupation of Saati, in 1886, and by other encroachments along the caravan routes between Abyssinia and the coast. King John sent an expedition, in January, 1887, against the Italians at Saati, and although failing to capture the place, he succeeded in annihilating a body of 500 men sent to its aid. A second attempt of King John against Saati also failed, and, among the rebel chiefs whom he attempted to punish, Menelek, king of Shoa, on the south border of Abyssinia, successfully resisted him. King John next turned his arms against the Mahdists on his frontier, and was defeated and slain in March, 1889. Menelek of Shoa had already formed an alliance with the Italians, and, encouraged and aided by them, he seized the succession to the Emperor John, and, after the submission of the principal lesser sovereigns, he was crowned emperor of Ethiopia in November, 1889. He had, in May, 1889, signed a treaty of friendship and commerce with Italy, in which it was stipulated that the "Negus Negust of Ethiopia agrees to avail himself of the King's government in all transactions that he may have with the powers or governments." This treaty was confirmed or extended by a convention for "mutual protection," in October of the same year, and was officially communicated to the several powers. By the two protocols of March 24 and April 15, 1892, England formally acknowledged that the Italian sphere of influence included the whole of Ethiopia and its dependencies. In the above treaty Menelek undertook to regard Italy as the most favored nation, and to allow free transit for all Italian merchandise throughout his dominions, beyond the payment of a regulated tariff at the frontier stations.

In addition to these diplomatic arrangements, steps were also taken to strengthen the position of the Italian administration, with a view to less dependence upon the good will of the native rulers. In June, 1889, the Italian troops occupied Keren, capital of the Bogos district. Two months later General Baldissera reached the tableland at Asmara and erected the fortress of Bet Maka. From Asmara General Orero moved southward into Tigré, against rebel chiefs who still held out in that kingdom. Jan. 26, 1890, he entered Adua, capital of Tigré, thus securing for Italy a firm footing on the plateau itself. In 1887, the head chief of the Habab nation had accepted the Italian protectorate, and this was extended the next year to the still more powerful Beni Amer people, to the Marea of the Ansaba valley, and to the whole of the Danakil territory, by a convention signed by the Sultan of Aussa, Dec. 9, 1888. The collective area of all these possessions, protectorates, and spheres of influence aggregates over 317,000 square miles, with an estimated population of 6,000,000. In this is included the empire of Abyssinia, 190,000 square miles, with a population of 5,000,000, embracing the kingdoms of Tigré, Lasta, Amhara, Gojam, and Shoa, with Harar and other dependencies; and with Abyssinia go all the southern Galla uplands as an Abyssinian dependency. Menelek, as king of Shoa, was glad to accept alliance with and protection from Italy, but as emperor of Ethiopia he deems himself at least the equal of the king of Italy, and claims that the convention of October, 1889, for "mutual protection," places both the contracting parties on the same level, making Italy no more his protector than he is the protector of Italy. His attitude, therefore, has been that of armed preparation to hold back Italy in any attempt to assert authority over Abyssinia, and in this attitude he has had reason to count upon the moral influence of both France and Russia. In maintenance of this attitude, Menelek has more than successfully met the military operations of Italy early in 1896, and for the present put an absolute stop to Italian efforts to bring Abyssinia into any kind of subjection or even dependence.

SOMALILAND. The extended nominal possessions of Italy in Somaliland, on the Indian Ocean, do not promise to be of any advantage to her. The British East Africa Company, across the Juba River, controls communication from South and Central Somaliland to the coast, and in the same way the trade going north finds its outlets in the stations on the Gulf of Aden which are within British Somaliland. Italy, therefore, cannot derive benefit from any part of her imposing nominal domain, except the limited and nearly useless Red Sea coast lands.

The British Somali coast protectorate was constituted when England found that the Mahdist rebellion obliged Egypt to withdraw her forces from all her outlying possessions on the northeast African seaboard. To protect the overland route to India from being menaced by other powers, and also to prevent the inroads of barbarism, England took possession of the points which Egypt had held along the north coast of Somaliland. The northwestern limits of this British Somali coast protectorate were recognized by the Anglo-French convention of 1888, and the southern limits by the Anglo-Italian treaty of 1891. The British position on this coast is of great prospective importance, in view of the future development of traffic between South Ethiopia and the coast. Since the British occupation, the ports of Berbera, Bulhar and Zeila have become flourishing outlets for the produce of Harar and North Somaliland. The extent of the Somali coast-lands under British rule is 30,000 square miles, with an estimated population of 240,000.

SOCOTRA. The island of Socotra, which forms geologically the northeasterly extension of the extreme northeast point of Africa on the Indian Ocean, became, by a treaty with the Sultan of Keshim, in South Arabia, in 1886, a possession of Great Britain. It is 80 miles long, with a mean breadth of 20 miles, an estimated area of from 1,000 to 1,500 square miles, and a population of about 12,000. Although separated from the point of the continent by a channel 150 miles broad, and in some places 150 fathoms deep, an almost continuous chain of islands, islets, rocks and reefs stretches the whole distance across the channel and distinctly marks the island as geologically the outlying point of the continent.

OBOK. France, commencing with a small purchase in 1855, and effecting treaties with native

chiefs in 1882, 1884 and 1885, has constituted the colony of Obok on the strait by which the Red Sea is entered from the south. The colony territory is 3,860 square miles in extent, and has a population of 22,000. It has no resources, nor any prospect of economic developments, and has no importance except for its position on the flank of the overland route to India.

EGYPT AND NUBIA. Egypt and Nubia are constituted a unit by the river Nile, with a line of separation at the first cataract, with the neighboring island of Philæ. Neither Egypt nor Nubia have any existence as habitable regions, apart from the Nile, beyond the left bank of which—that is, to the west—they merge at once in the Libyan Desert, while eastward, also, they are even more closely confined to the right bank of the river by the sandy or stony wastes and arid steppes extending thence to the Red Sea. Nubia has a far greater area than Egypt. Egypt at its widest part is scarcely 160 miles broad, whereas Nubia, between Dongola and Suakin, expands to about 430 miles. Yet the delta alone contains a vastly larger area of productive soil than the whole of Nubia. Scarcely another region of the same extent in the whole world can compare, in respect of population and wealth, with the 6,000 square miles intersected by the innumerable branches and irrigation canals of the delta between Cairo and the Mediterranean. Lower Egypt has 6,300 square miles of arable area; Upper Egypt, 7,000. The whole of Egypt, the entire area of which, as its limits are now fixed, is 380,086 square miles, with a population of 6,817,265, has 13,300 square miles of arable land. Nubia, with an entire area of 420,000 square miles, and a population of 650,000, has only 500 square miles of arable area. Acre for acre, the arable lands of Egypt are about three times more productive than average arable lands elsewhere. The opening of the Suez Canal, which transformed Africa into an island and revolutionized half the seaboard traffic of the globe, created, through the importance of this new route to India, an interest for England in Egypt which necessitated British intervention in 1882, when Arabi Pasha's military revolt threatened a disturbance of existing conditions that might have led to the occupation of Egypt by powers unfriendly to British interests in the East. British occupation from 1882 has given improvement to every branch of Egyptian administration, far beyond anything known in the Nile Valley since the golden days of the remote epoch of the twelfth dynasty.

SUEZ CANAL. The Suez Canal, which serves all the purposes of a great navigable river, has a total length of 98 miles, 66 through land and 32 through a chain of lakes. It was begun in 1859, was completed within 10 years, at an expense of $100,000,000, and was thrown open to navigation Nov. 17, 1869. By the purchase, in 1875, from the Khedive, of 176,600 shares for $19,875,000, now worth four times that sum, the British government is by far the largest single shareholder. The daily receipts now average about $30,000, and the net profits in 1893 were $8,000,000. Since 1894 extensive works have been in progress to enlarge the canal from an average width of 75 to 215 feet on the bed of the channel, and 264 between banks, and from a minimum depth of 26 feet to 28, and eventually to 30. Luminous buoys and electricity have been introduced to facilitate the night traffic, so that the through passage has now been reduced from 35 or 40 to about 20 hours, thereby nearly doubling the capacity of the canal. By the Anglo-French convention of October, 1887, both the waterway and the isthmus, for three miles on both sides, are declared neutral territory, exempt from blockade, fortification, or military occupation of any kind, the passage remaining open to the ships of all nations, whether armed or not, during peace and war.

Agriculture in Egypt has made such advances that, after meeting local demands, the country was able to export, in 1891, agricultural produce to the total value of about sixty-five million dollars, of which cotton and cotton-seed represented over fifty million dollars. The execution of a scheme now in hand, for constructing a great reservoir to retain the superfluous waters of the Nile in Upper Egypt, is expected to add twenty million dollars to the yearly value of the crops in that region. Recent developments have made Suakin an African port of great importance. Its position is midway of the over one thousand miles of the shelterless and almost harborless Red Sea coast, and at a point nearest to the great easterly bend of the Nile. It is, moreover, on the direct routes from Soudan, through Berber or Kassala, to Jiddah, for Mecca. It is the natural outlet, therefore, not only for the seaward trade, but for the religious zeal of some forty millions of African Mohammedans. To prevent the spread of Mahdist fanaticism eastward, England seized Suakin in 1883, after the first successes of the Mahdi, and has since held it and made it a formidable stronghold, not only safe from attack by sea, but protected inland by a chain of detached forts and redouts, with strong outposts at Tokar and other commanding points. A railway to Berber, over a route already surveyed by Gordon Pasha, was begun in 1884, and although the works were soon suspended, both commercial and strategical considerations will secure its construction at no distant day.

Cairo, with a population of 370,000, is by far the largest city in Africa, and the capital of Egypt. The Egyptian Institute, the chief scientific institution in the country, is located in Alexandria, the second city in Africa in population (215,000), but Cairo still remains the principal center of Eastern and Western learning, the seat of the great Mohammedan university of El-Azhar, and of hundreds of schools connected with the mosques, synagogues, and churches.

In Upper Nubia the great center of trade and population is Kassala, capital of the rich province of Taka. Founded in 1840, it had become, before the Mahdist revolt, a flourishing emporium with a strong Egyptian garrison, and it held out against the dervishes long after the fall of Khartoum, but only to be overcome at last. In July, 1894, the Italians followed up a crushing defeat of the dervishes by the capture of Kassala.

The railway system of Egypt, since the opening of the line from Port Said to Ismailia, has become

adequate for present requirements. It has a total development of 1,200 miles, ramifying throughout the whole of the delta, and running up the left (western) bank of the Nile to the present political frontier toward Nubia. The government telegraph system has a total mileage of 3,200, with 5,430 miles of wire, supplemented by telephonic communication between Cairo and Alexandria. British occupation alone secures the political stability on which all the material progress made since 1882 has been absolutely dependent.

What are known as the Cameroons, with a coast-line of about 300 miles, became German territory, by agreement with Great Britain, in 1805. This short coast-line begins a short distance north of the equator, and extends to the mouth of Old Calabar River. The territory embraces about 130,000 square miles, but only about 12,000, with a population of 500,000, is under the direct jurisdiction of the High Commissioner. The remainder, extending northeast to Lake Chad, is back-land not yet explored. The Cameroon Mountain, with three terminal peaks known as the Three Sisters, and attaining an altitude of nearly 14,000 feet, is the highest point yet known on the west side of the continent. Other mountains in the interior and on the eastern seaboard attain a greater height, but are far less imposing, because they rise from plateau elevations which are several thousand feet above sea-level. The Cameroon Mountain, or Mongo-ma-Loba ("mountain of the gods"), as the natives call it, springs directly from the water's edge, and is thus the most imposing mountain elevation of Africa. Its lower slopes are clad to a height of 6,000 feet with a magnificent forest vegetation; above are grassy slopes, and toward the summit are bare lavas which are at times streaked with snow. The whole mountain mass is of volcanic origin and character, with a base some 700 or 800 square miles in extent. The Cameroon highlands were formerly thought likely to prove a valuable health resort for Europeans exhausted by the generally enervating climate of West Africa, but experience has shown that the abundant rainfall in a region so near the equator gives a saturated hot atmosphere, which is not only very oppressive, but is often charged with malarious vapors rising to a considerable height from the marshy coast-land.

A fact of special ethnological interest in connection with the Cameroons is the character of its population. It is almost exclusively occupied by non-negro tribes of what is known as Bantu speech. The Bantu races are negroid, but not negro,—the negro modified by the Hamitic type found in northeast Africa. Among them crop out many examples of types which, generally speaking, show regular Caucasian features, oval face, straight nose and small mouth. North of the Cameroons a negro domain extends almost uninterruptedly through Upper Guinea and Senegambia to the Sahara, while south, from the north border of the Cameroons, extends a domain of the Bantu races across the continent southward to the Hottentot-bushman territory in the extreme southwest. Ethnological observation shows that the true negro of Africa is little inclined to, if not wholly incapable of, upward development; that where the negro element exclusively or mainly prevails there is little or no chance of progress; that in the Soudan, for example, all the intelligent and dominating peoples are mixed races, whose material and moral progress is in proportion to the absence of the negro element; and that the higher Bantu races, those in which the negro element is least pronounced, are especially ready to accept European control and especially capable of advancement. The typical Bantus have regular, almost European, features, and, what is still more remarkable, well-developed lower extremities.

There is no field in the Cameroons region for German immigration. The country is absolutely unsuitable for European colonization. There were only about 150 Germans in the colony in 1894.

The island of Fernando Po, which has been in the possession of Spain, by cession from Portugal, since 1778, lies at the head of the Gulf of Guinea, opposite the Cameroon Mountain, across a strait 18 miles wide. The culminating point of the island is an extinct volcano rising to the height of 10,000 feet, the imposing appearance, luxuriant vegetation and charming sylvan scenery of the island, with the magnificent Cameroon Mountain on the opposite side of the strait, form a magnificent gateway to equatorial Africa. It is said that the passage presents in clear weather one of the grandest marine panoramas on the globe. The native population, numbering about 30,000, are Bantus who call themselves Bubi, or "Men," and their island home Achimama, or "Universe."

South of the Cameroons the whole of the seaboard, nearly down to the mouth of the Congo, is the coast of French Congo, except that Spain holds a small territory on the coast just north of the equator. The great Congo Free State has a strip of territory coming out to the coast next north of the mouth of the Kongo River, and north of this a fragment of territory belongs to Portugal, under the name of Cabinda, its coast being that of Cabinda Bay. French Congo, extending far back into the interior and thence north and far to the east, contains an area of about 220,000 square miles, but most of it is very little known, and the population is variously estimated at from two to five millions. It lies entirely within the zone of greatest rainfall, but with diminishing excess in proceeding from north to south. The temperature is similarly modified in going from north to south, in consequence of the cool marine current setting steadily from the Antarctic waters along the seaboard. There is a similar change in the density of the forest regions, which steadily diminishes in going southward. The region of the Gaboon River, which is one of vast and oppressive forests, very unfavorable to the development of the higher forms of animal life, is the home, as Du Chaillu first discovered, of the gorilla, the largest and most ferocious of anthropoid apes. The population is a variety of Bantu peoples or tribes, presenting all shades of transition from the negro to the Hamitic type. Through an extended region of central Africa, on both sides of the equator, there still exists, and in

fact flourishes with unabated vigor, the practice of regarding the human species as on a level with cattle, in respect to provision of animal food. So thoroughly is the practice accepted that the victims of it are as indifferent to their fate as to anything else which they take as a matter of course.

Du Chaillu's report of the existence of a pygmy people in the equatorial forests of West Africa, though received at first with incredulity and even with derision, has been fully confirmed by wider knowledge; and even smaller pygmies were found by Stanley, Schweinfurth, by Pogge and Wissmann, and by Emin Pasha. Anthropologists have come to the general conclusion that the intertropical forest lands are the home of pygmy peoples, all belonging to the same primitive stock, and older than the tall negro and negroid races.

French Equatorial Africa, as at present administered, seems incapable of development. The white population is limited to about 300, dispersed among 28 stations. There are nowhere any roads beyond the native tracks, and the country is still mostly covered with dense forest. The exports are mainly limited to the natural produce, such as ivory, ebony, caoutchouc and palm oil, though some experiments have been made with coffee, cotton, tobacco, sugar and vanilla growing. The income from the territory is under $300,000, while the annual expenditure is about $1,060,000. France has been in possession for nearly 60 years.

The tract claimed by Spain within the limits of French Africa is in connection with islands off the coast, which Spain holds as a dependency of Fernando Po.

Congo Free State. The Congo Free State, with an area roughly estimated at 900,000 square miles and a population of about 14,000,000, was very largely a result of Stanley's great expedition across the continent (1874 to 1877,) when he traced the southern feeders of the Victoria Nyanza, circumnavigated that lake, explored Uganda, discovered the northern lake, Albert Nyanza, came south to and circumnavigated Lake Tanganyika, and crossed thence to the Lualaba, and, tracing its course, identified it with the Congo, the mouth of which he reached in August, 1877. Upon the completion and report of these discoveries Stanley was commissioned by Leopold II to undertake more thorough exploration, with a view to the creation, in the immense Congo basin, of a free state having for its aim the protection and assistance of the native tribes. This task, undertaken by Stanley, occupied altogether five years (1879 to 1884), with a brief visit, for report, to Europe in the latter part of 1882. Upon Stanley's completion of his mission in 1884, what was called the "African International Association," sustained by the King of the Belgians, took charge of this Congo interest, which included treaties with various African chiefs, no less than 450 in number. The Association asked the great powers of the civilized world to extend recognition to this organization of protection for the natives of the Congo region, but England stood aloof, while France and Portugal attempted to make seizures of points of advantage within the territory. Recognition, however, was extended to the Congo Free State by the United States, and the Congress of Berlin, in 1885, formally constituted it a sovereign power, under international guaranties, with the administration in the hands of the King of the Belgians. For all practical purposes, the Congo state coincides with the Congo basin, although the latter had been somewhat encroached upon by rival European powers. Geographical explorations next in importance to Stanley's revealed the character of the vast Kassai River system, ramifying in every direction on the south side of the Congo River, and this was balanced on the north by the Ubangi (or Mobangi), of which the Welle, discovered by Schweinfurth (1870), was in fact the upper course. With the completion of discoveries the Congo-Zambesi waterparting was settled upon as the southern boundary of the Congo Free State, while on the east side it extends to the western shore of Lake Tanganyika. By the Franco-Belgium agreement of August, 1894, the frontier toward French Congo follows the course of the Ubangi to the Mbomu, and then follows the Mbomu to its source. A convention of February, 1885, between Portugal and the African International Congress, gave the Congo Free State a seaward outlet and piece of coast on the right bank of the Congo estuary, and in March, 1894, the frontier line toward Portuguese West Africa was finally settled. As thus constituted the Congo Free State has an area roughly estimated at 900,000 square miles, with a population of about 14,000,000.

In superficial extent the basin of the Congo, about 1,600,000 square miles, ranks next to that of the Amazon, 1,800,000 square miles. The headwaters of the main stream and of its chief southern branches are spread over a great part of the continent. Two, at least, of its branches, the Ubangi on the north and the Kassai on the south, drain areas (170,000 and over 200,000 square miles, respectively) very much larger than the whole of the British Isles; others, such as the Aruwimi, or Itimbiri, and Alima on the north, the Boloko, Lopori, and Juapa on the south side, vie in length and volume with the great rivers of western Europe. The farthest head-streams rise thousands of miles away to the southeast, where the sources of the Zambesi are separated only by a narrow ridge from the affluents of Lakes Nyassa and Hikwa, within 450 miles of the Indian Ocean, and where those of the Lualaba rise at the foot of Mount Koamba, close to the main source of the Zambesi. On the other hand, the southernmost tributary of the Kassai has its source close to the northwestern feeders of the Zambesi, and within 350 miles of the Atlantic. In general outlines the section of the plateau lying within the Congo basin presents the aspect of a somewhat alluvial plain, with a decided tilt toward the Atlantic, with encircling heights rising from about 3,000 to 6,000 feet, but nowhere crossed by any distinct mountain range. The fall is continuous, and for the most part gradual, from the surrounding border heights down to the central artery, which drains a basin 1,400 miles long and 1,200 broad, through a single river outlet some six miles below the equator. This great Central African depression

was probably, at one time, the bed of a vast inland sea, which is now represented in the lower Congo regions by Stanley Pool, a sheet of water less than 100 square miles in extent. This inland sea formerly poured over the Atlantic coast ranges in a series of tremendous cataracts, which have slowly eaten away the rocky barriers down to the level of what are now called the Livingstone Falls, a series of 32 distinct rapids in a distance of somewhat less than 170 miles, with a total fall of nearly 900 feet. The Congo estuary, 120 miles long, with an average breadth of five or six miles, and a depth, in some places, of over 200 feet, looks like a delta in course of formation, and the time is perhaps not distant when a Congo delta will be created, rivaling in extent those of the Niger, Nile and Mississippi.

Above the Congo narrows, or stretch of rapids, there is a clear waterway of nearly 1,000 miles, from Stanley Pool round the great horseshoe bend of the river to Stanley Falls, on the equator. Throughout the whole of this middle course of the Congo there is a majestic island-studded current, in some places broadening out to a width of 8 or even 10 miles, and at a mean elevation of about 1,200 feet above the sea. About 90 miles above Stanley Pool there enters the main stream, on the left, a broad, deep channel called the Kwa, conducting the waters of the vast Kassai system of rivers. The Kassai, which is the central artery of the great southern river system, has for its largest tributary the Kwango, a stream which makes, in a distance of over 600 miles, a total descent of over 4,000 feet.

A few miles below the equator the Middle Congo is joined by its great tributary from the extreme northeast, the Ubangi, which takes the name of Makua in its middle course, higher up, and that of Welle near its head-waters. This Ubangi-Makua-Welle River must prove of vast importance in the future development of Central Africa. Throughout its lower reaches, and between Congo Falls and the Kibali Falls, which obstruct its upper course, it is navigable for hundreds of miles by river steamers of considerable size. It thus affords almost unbroken water communication from Stanley Pool across the continent to the Nile basin in the east, and to the Chad basin, through the River Shari, in the north. It traverses one of the finest and most densely peopled regions in the whole of Africa.

Above the Ubangi, the Middle Congo receives on its right bank three other large tributaries,—the Ngala or Mongalla, the Loika or Itimbiri, and the Aruwimi. Here begins the great Central African forest zone. Stanley plodded for 160 days up the Aruwimi valley, through endless forests. The stream has a course of about 700 miles, draining a densely wooded region nearly 70,000 square miles in extent, but as a highway of communication with the Nile basin it cannot compare with the Ubangi-Makua-Welle. In 1890, the unexplored tract between the northeastern tributaries of the Congo and the Welle-Makua basin was crossed at two different points and such connections made that it is now possible to proceed by known routes across the whole length of the continent, from the Nile delta to Cape Town.

Taken as a whole, the great Central African depression, the Congo basin, must necessarily be debilitating, and more or less dangerous, for all European residents, partly because of the high normal temperature, ranging from about 60° to 90°, but still more from the excessive moisture of the atmosphere and the sudden transition from hot days to chilly nights. The winds, coming perhaps from a great distance, are often charged with miasmatic vapors, which give rise to chills and ague of a peculiarly treacherous character.

Central Africa is by no means one vast primeval forest; nevertheless, a far greater space is covered with continuous and almost impenetrable woodlands than might be inferred from hasty generalizations, such as those of Professor Drummond, in his *Tropical Africa* (1888). The Congo basin may be roughly divided into two distinct regions, a forest zone occupying nearly the whole of the northeast, and an open zone, mainly of savanna and arable lands, comprising all the rest. Owing to the great uniformity of soil and climate, the economic plants, such as maize, manioc, millet, tobacco, hemp and sugar-cane are everywhere successfully cultivated. These, with the banana, which yields prodigious quantities of wholesome food, form the chief agricultural resources of the country. The few experiments already made show that most European fruits and vegetables might be raised on the plateau and surrounding slopes. Most of the economic plants have been introduced by Europeans from America, and their introduction is said to have more than compensated for the evils caused by the sale of spirits and firearms. Where, four centuries ago, the tribes lived mainly by hunting wild beasts, by man-hunting, by fishing, and by very rudimentary agriculture, they now depend altogether on their own system of husbandry.

Congo Fauna. A characteristic of Africa is the vast range of the larger quadrupeds and amphibia. The elephant, found on the banks of Lake Chad in the north and of Nake Ngami in the south, also frequents every part of the Congo basin except the steppe lands; the hippopotamus and crocodile, which infest the Nile, Zambesi, and Limpopo, also crowd the Congo waters to such an extent as almost to obstruct navigation in some rivers. Other widely diffused animals are the buffalo, several species of antelope and the chimpanzee. The attempts made to acclimatize European domestic animals have hitherto failed.

Congo Population. Central Equatorial Africa is anthropologically a region of physical diversity and linguistic unity. Closely related Bantu forms of speech hold almost exclusive possession, while the Bantu populations themselves present the usual transitions from the negro to the Hamitic or other higher types. The negro element is perhaps less conspicuous in the south and east than in the west and north, and in the Welle or Upper Ubangi basin, both the negro type and negro or non-Bantu tongues are distinctly dominant. The district of the Congo Falls may be taken as the parting line between the negro and Bantu domains in the central equatorial region. Here, also, is entered the cannibal zone, throughout

which human beings are treated precisely as cattle with reference to a supply of food.

BA-LOLOS. Notable among the Congo tribes and nations are the Ba-Lolo and Ba-Luba. The Ba-Lolo is a great nation within the extensive horseshoe bend of the Middle Congo, a territory considerably larger than the whole of the British Isles. Ba-Lolo means "men of iron," either in reference to strength in battle or, more probably, to skill as forgers. They are, both physically and mentally, one of the finest Bantu races. Their features might fairly be called Caucasian. They appear to have migrated early in the century from the east or northeast, Galla or Kaffaland, to their present homes, where they have cleared the forests, brought vast tracts under cultivation, and built towns regularly laid out in the American style. They are extremely skillful workers in iron, producing agricultural implements, such as hoes, spades, and axes, as well as knives, spears, and ornaments, all of excellent quality and mostly in good taste. They also understand the division of labor, and the women have their rights and take part in the public assemblies where all important questions are discussed.

The BA-NGALA, occupying both sides of the Congo about the Ubangi confluence, are a fine race, with regular features and marked intelligence. They have already begun to appreciate the comforts of civilized life, having, to a considerable extent, exchanged their scanty costume of vegetable fiber for European clothes. Yet witchcraft, human sacrifices, and even cannibalism, are still rife among them.

BA-LUBAS. South of the Ba-Lolo domain a dominant race, in the Middle Kassai region, are the Ba-Luba, described as the finest of all negroid peoples; highly intelligent, industrious, and surprisingly skillful workers in iron and copper; the only African tribe among whom, in their primitive state, there has been observed anything like a becoming conjugal affection and regard; and the most open to the best influences of civilization of any African tribe whatsoever.

BA-KETE, BA-SONGE AND KIOKOS. The Ba-Kete, or Ba-Kutu, dwelling on the right bank of the Lulua, about Luebo station, a somewhat effeminate negroid people, are noted for their excellent husbandry, admirably tilled plantations, in which are grown a profusion of cereals, fruits, and vegetables. To the northeast from them dwell the Ba-Songe, remarkable for their splendid physique and for their skill in various crafts, such as pottery, weaving, wood-carving, iron and copper work. They, like the Ba-Lolo and Ba-Ngala, build towns with the houses so widely apart that it takes hours to go from end to end of a continuous town. The Kiokos, in the Upper Kassai and Upper Kwango basins, are probably the most enterprising of all the Congo nations. They came originally from the Zambesi valley, and still occupy the western water-parting between that river and the Congo basin. All travelers describe them as famous hunters and craftsmen, noted especially as skilled forgers and armorers.

From all the facts thus far accumulated the conclusion is now generally reached that the more or less negroid Bantu populations of the Congo regions, numbering probably 30,000,000, are far superior, both in physical and mental qualities, to the true negroes of Upper Guinea and the Soudan. The Hamites are a main branch of the Caucasian, or highest division of mankind; hence the Congo Bantu peoples, largely negroid Hamites, betraying a distinct Hamitic strain, are naturally capable of upward development, and all the more rapidly as the Hamitic element predominates. The witchcraft, human sacrifices, savagery and even cannibalism still widely prevalent may be considered due to the negro substratum. Their surprising skill in the industrial arts, such as weaving, pottery, wood-carving, iron and copper smelting and forging, house and boat building, as well as their capacity for political organization, as seen in numbers of powerful states, founded at various times, may in the same way be regarded as inheritances from their Hamite ancestors. It is noteworthy that, as a rule, the higher faculties increase eastward and southward; the baser qualities, westward, and especially northward,—that is, in the direction of the negro domain proper.

MISSIONS ON THE CONGO. The numerous civil and missionary stations, about 40 in number, founded at various convenient points in the Free State, are fast becoming important centers for the diffusion of civilizing influences among the surrounding populations. The natives rarely attempt opposition to missions; some even clamor for the privilege of securing such strongholds of law and order in their midst. They learn improved methods of tillage and better industrial processes; they grow accustomed to orderly dealings, become gradually weaned from their barbaric usages, begin to despise their witch doctors, and acquire a taste for better clothing and other European comforts. Increased necessities among them tend to develop the elements of the future commercial relations through which the missions may prove modest beginnings of flourishing trade centers for the spread of wealth, refinement, and civilization throughout the Central African populations.

CONGO COMMUNICATIONS. An absolute necessity of trade development on the Congo is a railway running from the coast, or the mouth of the river, as far as to Stanley Pool, above the series of falls which prevent the navigation of the Lower Congo. A Belgian company has undertaken to construct such a railway on the left bank of the river, from just below the lowest fall to Stanley Pool, above the highest. The distance is 270 miles, through a somewhat rough country, but with only about 25 miles which present any engineering difficulties. The first section, 25 miles long, was completed in September, 1894, at a cost of $3,670,000, the estimate for the whole line being $11,250,000. Another line has been projected for the right bank of the river, running from Kabinda to Boma, the chief outlet of the whole basin, and thence to Brazzaville, the French station on Stanley Pool. The navigation of the Congo is controlled by an international commission, nominated by the powers who took part in the Berlin conference of Feb. 26, 1885.

The Belgian legislature in 1885 placed the Congo

Free State under the sovereignty of Leopold II, not as King of the Belgians, but in his individual capacity. The central government, consisting of the King and three ministers, is located at Brussels. There is also a local government, comprising a governor-general and other officers, civil and military, with official residence at Boma, on the right bank of the mouth of the Congo.

PORTUGUESE WEST AFRICA. Until recently the Portuguese possessions on the west side of Africa were limited to the zone of coast-lands stretching from Ambriz, at 8° S. lat., for about 850 miles southward to Cape Frio, beyond the Cunene River, with interior frontiers nowhere clearly defined. The country as actually administered had an average width of about 220 miles, with a total area of nearly 200,000 square miles, and a population of about 3,000,000. From Ambriz north to the Congo, possession by Portugal was contested by Great Britain until the Berlin conference of 1885 gave the former the territory right up to the left bank of the Congo. By subsequent agreements with France (December, 1885), with Germany (December, 1886), and with Great Britain (August, 1890), the interior frontiers were determined, giving to Portugal a domain in West Africa about 520,000 square miles in extent, with a population vaguely estimated at from 3,500,000 to 5,000,000. Only the western parts, comprising the low-lying coast-lands between the sea and the edge of the plateau, are occupied and administered by Portugal. The whole of the uplands are practically independent, and the slave-trade is still openly carried on, and not without aid from individual Portuguese.

In connection with the opening of the Congo, Portugal endeavored to secure a considerable territory on the coast north of the Congo, as far north as to the south border of French Congo. By the intervention, however, of the other powers, it was settled, in 1885, that the Congo State should be brought out to the coast, with a breadth of about 40 miles north of the Congo, but leaving to Portugal a wedge of territory next to French Africa, in which is included Kabinda, a spacious and well sheltered port, which seems destined to become a chief emporium of the region, with a prospect of great prosperity from the building of the railway on the right bank of the Congo as far as to Stanley Pool.

Angola, properly Ngola, is now the official designation of all the Portuguese West African possessions, comprising the separate Kabinda district and the three administrative provinces of Angola on the north, next to the Congo, Benguella in the middle, and Mossamedes on the south. The coast-lands of these three provinces, widest in the north near the Kongo and narrowest in the south, have a mean breadth of not more than fifty miles. Beyond this low-lying zone of alluvial coast-lands the ground rises very rapidly into a bold ridge, the highest passes of which reach an altitude of between 6,000 and 7,000 feet, and from these it falls again to 4,000 feet, which is about the mean elevation of the central plateau between the Congo and Zambesi water-sheds. About half way between the Congo, on the north, and the Cunene, which forms the south limit, the ridge is broken through by the deep valley of the Coanza River, which is the great water-course of Portuguese West Africa. The Coanza rises in Lake Mussombo, on the plateau 5,500 feet above the sea, and sweeps, in a vast semi-circle over 700 miles long, round by the northeast, north and west, to its entrance to the Atlantic. It develops at one point the magnificent Livingstone Falls, with a clear drop of 70 feet. The valley of the Coanza forms, at least in its lower course, a climatic and botanic, as well as a physical, parting-line. The region to the north of it is essentially Central African,—hot, moist, more or less malarious, unsuitable for European settlement, somewhat thickly wooded, and forming the extreme southern limit of the palm family. To the north of the Coanza, Portuguese Angola may be broadly described as a fever-stricken, productive region, inhabitable only by natives or half-castes. In the region south of the Coanza the conditions are greatly modified, temperature, rainfall, malaria and vegetation decreasing gradually in the direction of the arid and almost rainless districts about the basin of the Cunene River, near its mouth. The easterly winds which prevail on the table-land of Benguella, the most southerly province, come from the far interior, and are cool, invigorating and healthy; they come, in fact, from one of the very healthiest regions of Central Africa, the Garenganze highlands, and they blow across the great plateau, over 5,000 feet high, which forms the water-parting between the Congo and Zambesi depressions.

The Bantu population of Angola represents nearly every shade of transition from the negro to the Hamitic type, and every degree of culture from the absolutely savage state of the Mushi-Congo to the almost semi-civilized condition of the kindred and neighboring Eshi-Congo.

From Ambriz south along the whole of the seaboard to the Cunene River, and inland to the plateau, are found the widespread A-Bunda, who have been long in contact with Europeans, and with whom whites, both from Portugal and Brazil, have contracted numerous alliances, resulting in a large mulatto element, distinguished by considerable intelligence, energy, and capacity for trade. The commercial enterprise for which the mulatto element is everywhere noted is also everywhere associated with the slave-trade. Of full-blooded Portuguese there are not more than 4,000, including officials, soldiers, and traders, in all Angola. It is mainly by miscegenation that the Portuguese have perpetuated their race in West Africa. On the whole, the Cunene basin may be regarded as the northern limit of possible white colonization on the southwest side of the continent. Portuguese West Africa labors under two great physical disadvantages: a deadly climate in the fertile northern provinces, an arid soil in the relatively healthy southern provinces. Loanda, the capital, and the oldest Portuguese settlement south of the equator, the largest place on the West Coast between Upper Guinea and the Cape, has a population scarcely exceeding 15,000, while the unsanitary state of the town and the absence of much-needed harbor-works betray here, as elsewhere, the inca-

pacity of Portugal to develop the resources of her colonies. Since the abolition of the slave-trade the revenue has never sufficed to cover the expenditure.

ANGRA PEQUENA. From the southern limit of Portuguese West Africa to the Orange River, which is the northern limit of Cape Colony, a very extended region had been commonly assumed as destined to be British, and one district about midway of the coast, from south to north, that of Walfish Bay, had been occupied and officially recognized as British, but in the year 1884 a merchant from Bremen, Herr Luderitz, concluded a series of political and commercial treaties with native chiefs, whereby a claim was established over Angra Pequena, on the coast, in the southern part of this region, and over vast districts beyond, toward the interior and toward Portuguese West Africa. Germany had not heretofore attempted to found a colonial empire, but, Aug. 7, 1884, the German flag was hoisted at Angra Pequena, and, October 13th, the Powers were formally notified that Germany undertook a protectorate over Southwest Africa, from the Cunene River on the north to the Orange River on the south. By two conventions with Great Britain (December, 1884, and July, 1890), and one with Portugal (December, 1886), the German claim was duly recognized and the limits of the protectorate determined. The region thus formed has a total length, north and south, of about 900 miles, a mean breadth, east and west, of 400 miles, and an area roughly estimated at 400,000 square miles, with a scattered population supposed not to exceed 250,000. By a special arrangement the north frontier of the German protectorate is carried through to the Zambesi River, assigning to Germany a narrow strip of territory south of this, nowhere less than 20 miles wide, by which Germany can have free access to the great eastern river of Africa.

GERMAN WEST AFRICA. German West Africa is ethnologically divided into Ovampo on the north, Damara in the middle, and Great Namaqua in the south. The first of these is, in many parts, well suited for agricultural pursuits, sufficiently watered, and of great natural fertility. It is also apparently rich in minerals. Malarial fevers prevail through the austral summer season, from November to April, but of a far less virulent nature than in Angola to the north. In Damaraland, grassy plains and slopes afford excellent pasturage for numerous herds of horned cattle. South of this, in the north of Great Namaqualand, is the great stony desert of Namieb, a vast plain rising almost imperceptibly landward, and, east of Walfish Bay, attaining an altitude of 2,000 feet at a distance of 60 miles from the sea; then next south, the valley of the Kuisip, converging on Walfish Bay; and beyond that a region of sandy dunes, stretching parallel with the coast-line southward to the basin of Orange River. These three sections together make a region compared with which none of equal extent anywhere on the globe is so barren, so unproductive, and so thinly peopled. There seems to be no future for any part of German Southwest Africa, except in Damaraland, which might afford support to a limited number of European stock-breeders. The rainfall is not sufficient to repair the loss suffered by evaporation. On the seaboard it comes chiefly in the form of mist during the winter season, whereas farther inland it occurs only in summer, and nearly always in connection with fierce thunder-storms. The annual rainfall, averaging probably not more than three inches for the whole region, is nowhere sufficient to maintain permanent watercourses on the Atlantic slope of the divide. Not a single perennial stream reaches the sea for the space of about a thousand miles. The whole of the southwest coast, however, is exposed to the influence of the cold marine current which sets steadily northward from the Antarctic waters; hence the temperature is rarely excessive, even in summer, and is all the more endurable because of the extremely dry atmosphere. This gives a general absence of malaria, except in the marshy districts of Ovampoland.

The whole region is a land of transition between the northern Bantu and southern Hottentot races. The northern division, Ovampo, is occupied exclusively by Bantu peoples; the southern, Namaqualand, by the Hottentots, or, as they call themselves, Khoi-Khoin (men of men); while the central division, Damaraland, is a debatable region, where the two races have for generations struggled for the ascendency. The great bulk of the population of the whole region is Bantu in the north, but fully three fourths of the territory is Hottentot. The Namas, the true aborigines of Namaqualand, may be taken as the most typical branch of the Hottentot race in the whole of South Africa. They possess some traits, such as black, woolly hair, broad flat nose and thick everted lips, in common with the negro; but other peculiarities, both physical and mental, require them to be separated from that race. On the ground of these peculiarities, and on other grounds, it has been inferred that the bushmen are the true aboriginal element in South Africa, and that the Hottentots are fundamentally bushmen modified by crossings with the negro and negroid peoples advancing from the north. A phenomenal perfection in the structure of the language spoken by the Hottentots, who are one of the most degraded ethnical groups surviving in any part of the world, cannot be accounted for on any satisfactory theory yet suggested. The Hottentot language is as great a puzzle to philologists as the race itself is to the anthropologist. Notwithstanding the debased condition of the people themselves, their speech is highly developed, both in a rich phonetic system, a very delicately graduated series of vowels and diphthongs, and in a varied grammatical structure. It possesses tones by which different meanings are imparted to the same word; it has a true objective case, clearly indicated by the endings in the singular, dual and plural; and, like the very highest orders of speech, it has evolved true grammatical gender, marked by distinct endings for the masculine, feminine and neuter of all three numbers.

WALFISH BAY DISTRICT. The British district of Walfish Bay, lying about exactly midway of the German West African coast, has a total area of some 700 square miles. Its geographical and political importance can scarcely be overrated. It is prac-

tically, by reason of the great watercourses (the Tsoakhub and Kuisip), which here converge from the northeast and southeast, the only natural outlet for a region some 400 square miles in extent. It is, in administration, a dependency of the Cape, and is politically held by England in trust for her future South African empire, the consolidation of which has already begun. Germany may be compelled to abandon her Southwest African protectorate on account of the difficulty of making it profitable without possession of Walfish Bay, which Great Britain certainly cannot afford to give up.

CAPE COLONY. Discovery and colonization began for South Africa at the Cape, round which the Portuguese sailed in the time of Columbus. What is known as Cape Colony was originally founded by the Dutch about the year 1652. It was taken by the English in 1796, at which time it had extended east to the Great Fish River. From 1803 to 1806 it was in Dutch possession under treaty stipulations, but was again made British in 1806, and has since that time been greatly enlarged by the annexation of adjoining districts, such as Basutoland, Griqualand West and Bechuanaland. It now constitutes a compact imperial dominion nearly 600 miles long from ocean to ocean, and 450 miles broad between the Orange River and the South Coast, with a total area of about 290,000 square miles, and a heterogeneous population of nearly 2,000,000. Its total coast-line, from the Orange estuary on the West Coast, to the Umzimkulu estuary on the East Coast, is over 1,200 miles. This coast-line is broken by several bold headlands, such as Cape Castle, some distance up on the West Coast; Cape of Good Hope, at the southernmost point of the West Coast, but not the southernmost point of the continent; Danger Point, about midway of a stretch of coast with a southeast trend; Cape Agulhas, the extreme southernmost point of the continent; and the two capes, St. Francis and Recife, at the easterly end of an extended south coast, where the general coast-line begins to trend more directly northeast. The coast is absolutely destitute of any islands, with the single exception of Robben Island, in Table Bay, a little north of Cape Town. Cape Town, the capital of the colony, and largest city in Africa south of the equator, lies, not on the coast facing the southern seas, but on an inland water, Table Bay, which is shut in on the east, south, and west by mountains,—the Devil's Peak, Table Mountain and Lion Mountain. The city faces due north, toward the bay. The Lion Mountain, on the west, together with extensive harbor-works, protects the bay from the fierce western gales, and from heavy seas rolling in from the ocean. The grand semicircle of sloping mountain sides on which the city is built presents a superb panoramic view. The population had reached, in 1891, over 51,000, and with the suburbs, 84,000. Salandha Bay, on the West Coast, due north of Cape Town, is by far the finest natural haven in the colony; of easy access, spacious, very deep water and almost completely landlocked. It was long the chief naval station of the Dutch, but since their time has been completely deserted, no vessel ever entering its waters; only a few farmsteads and fishing-hamlets occupying its shores, and the nearest town, Malmesbury, being over 30 miles to the southeast. Port Nolloth, a few miles below the Orange estuary, is the outlet for the ores of the Little Namaqua copper-mines of Ookiep, near the Vogel-Klip Peak (3,400 feet), with which it is connected by a horse-railway 92 miles long. These copper-mines, with many thousand acres of unproductive land, belong to an English company, which has been working them since 1863. With deposits recently struck at a depth of over 500 feet, which are even thicker than those nearer the surface, there seems to be an inexhaustible supply of copper. From Cape Town, in a northeasterly direction to Kimberley, runs a great trunk line of railway, which was, in the year 1890, extended northward to Vryburg, just west of the southwest district of the Transvaal. This railway forms a kind of parting-line between two absolutely distinct regions, the arid and almost uninhabited northwestern steppe lands and the relatively well-watered, fertile and thickly settled southeastern provinces. On the one side of this line, to the north and west, there are no large towns, even the capitals of divisions being merely rural villages. Hopetown, however, the farthest northeastward of these, on the south bank of the Orange, near where the railway crosses the river, and where there is a bridge 1,400 feet long, is a place of growing importance. It is 600 miles distant from the Atlantic, and for the whole distance the Orange River has not a single permanent settlement, beyond a few isolated farmsteads, some missionary stations and bushman camping-grounds, and on the German side the little colony of Stolzenfels. Even on the great railway, with several thriving stations, there are no great centers of population. In the region south of the trunk line are concentrated the great bulk of the white settlers, where climate, soil and general environment are more nearly European than in any other part of Africa. Graham's Town, which dates from 1812, is the center of administration for the eastern provinces, and has hopes of becoming the capital of the future South African confederation. It stands in a healthy district 1,750 feet above sea-level; is largely occupied with ostrich-farming; the population is chiefly English; and it is now connected by railway with Port Elizabeth, to the southwest, and with a new outlet on the coast, Port Alfred, farther to the northeast.

PORT ELIZABETH, the largest place in the colony, next to Cape Town,—population over 23,000 in 1891,—is the first place in the colony in commercial prosperity and the extent of its foreign exchanges. Its exports are diamonds, wool, ostrich feathers, and hides. Its position is a central one, nearly midway on the 1,600 miles of coast from Cape Town to Durban, the great shipping-port of Natal. It is a little over 400 miles by rail from Kimberley. As a seaport, lying under the sheltering headland of Cape Recife on the west side of Algoa Bay, it may be regarded as the most convenient natural outlet for the whole of southern Africa, but, as yet, next to nothing has been done to improve its splendid natural position. The harbor is an open roadstead,

so exposed to the fierce southeasterly gales that it is visited by but few sailing-vessels, nearly the whole of its foreign trade being conducted by powerful ocean-going steamers, landing from which, in rough weather, is an ordeal not without risk. This "Liverpool of Africa," as it has been called, is the seaward terminus of two important railways,—one to Bloemfontein, capital of the Orange Free State, with a branch to Graham's Town, and another northwestward branch; and the other lying more to the west, and running to Graafreynet through several thriving market towns and centers of agricultural industry.

In the eastern division, beyond Graham's Town toward the Kafir frontier, there are no Dutch and very few English settlements. Six in the extreme east are all stations on a railway running from East London on the coast to Aliwal north on the Orange River at the Free State frontier. It was in this district that various settlements were formed by the Anglo-German legion when it was disbanded after the Crimean War. The administrative center here is King William's Town, a flourishing trading-place and chief depot for the traffic with Kaffraria. East London, the only outlet for the whole region, has extensive harbor-works, carried out in recent years, yet it still remains an exposed roadstead, inaccessible for days together. Since 1888 the South African railways have been developed in the direction of a common continental system, which already reaches Pretoria, capital of the South African Republic, and Johannesburg in the same state, and is likely to be extended to the Zambesi, and thence to Buluwayo and Salisbury.

Cape Colony has over 8,000 miles of roads, and government railways 2,253 miles in total length, involving an investment of $99,160,095. The telegraph lines comprise 5,602 miles. They are operated and were in great part constructed by the government.

Besides 537 square miles of forest in Cape Colony, a total area of 100,609,606 acres is in the hands of private owners, and 41,041,025 acres are still public land. The chief agricultural productions are wheat, oats, barley, mealies, Kafir corn, rye, oat hay, tobacco, wine, brandy and raisins. Other products are wool, mohair, ostrich feathers, butter and cheese. The sheep-farms of the colony are often of very great extent, from 3,000 to 15,000 acres and upward. Farms in tillage are comparatively small. It is owing to the generally deficient rainfall that pastoral pursuits necessarily prevail over tillage. Of the 92,000,000 acres distributed among 20,000 holdings in 1890, less than 1,000,000 were under cultivation, the chief crops being wheat (4,000,000 bushels) and maize (3,000,000 bushels). Nearly 20,000 acres are occupied by the most productive vineyards in the world, yielding an average of 6,000,000 gallons of wine and 1,250,000 of brandy. Improved methods of irrigation are bringing more land under cultivation every year, especially where advantage can be taken of the nature of the ground to create artificial reservoirs. Basins of vast size, containing from 100 to 200 and even 250 million gallons, have been made the means of reclaiming extensive tracts in the karoos, or dry, barren plateaus. The streams, also, are utilized and distributed by canals over the surrounding land, while the underground waters are reached by deep wells, pumps and other appliances. Pasturage and stock-breeding of all kinds have been greatly developed, especially in the eastern provinces. Cattle of the long-horn Dutch variety are largely bred as draft animals; the native fat-tailed sheep yield mutton for the market; while the Angora and English breeds supply large quantities of wool for exportation. The colony is, in respect of industries, still mainly dependent on the mother country for textiles, hardware, chemicals, paper, china and earthenware; but more or less successful essays have already been made at distilling, brewing, tanning, spinning and weaving, carriage-building and soap-making. Foreign trade is rapidly increasing, the total imports and exports having advanced from $60,000,000 in 1884 to $123,475,000 in 1893.

The government of Cape Colony is a governor appointed by the crown, a ministry of 6 members, a house of assembly elected for 5 years, and a legislative council, or upper house, of 22 members elected for seven years. By a law passed in 1882, speeches may be made in the Cape parliament both in English and in Dutch. The systematic British immigration begun in 1820, and at first promoted by state aid, resulted in making an eastern division of the colony, which was mostly British, with its center at Graham's Town, while the western division remained almost wholly Dutch; but a process of fusion followed, making Cape Town, in the west, almost an English city, while some of the eastern districts show a majority of voters of Dutch descent, and antagonism between the English and Dutch is nowhere found.

BASUTOLAND. On the northeast of the extreme east end of Cape Colony lies Basutoland, an irregular oval with an area estimated at 10,293 square miles. It borders on the Orange Free State. It is one continuous elevated plateau, though broken and rugged, and the abundant grass on it has enabled the Basutos, its native African population, to rear immense herds of cattle. It is well watered and has a fine climate, and is said to be the best grain-producing country in South Africa. British possession was first taken by annexation to Cape Colony in August, 1871, but since March 13, 1884, it has been directly under the crown, with a resident commissioner as governor. The population at the last census, in 1891, was 587 Europeans, and 218,324 natives. European settlement is prohibited, permanent occupation being reserved to the natives.

BECHUANALAND. On the other side of the Orange Free State, and to the west of the South African Republic, lies an extensive region constituting an annex to Cape Colony, on the north side of the Orange River, and bordering to the west on German West Africa. The larger part of this region to the west and north is the crown colony of Bechuanaland, with an area of 71,000 square miles, annexed Sept. 30, 1885, and a still larger extent of territory to the north of it, attached by way of a protectorate, making the whole Bechuanaland region under the colonial governor 170,000 square miles. The

governor of Cape Colony is the governor, acting through an administrator, whom he appoints. The general elevation of the country is from 4,000 to 5,000 feet above sea-level. The climate is healthy. Many parts are deficient in water-supply. The chief industry is agriculture, and the country is well adapted to the growing of maize and the raising of cattle.

GRIQUALAND WEST. The southeastern section of this region north of the Orange River is Griqualand West, lying next to the Orange Free State. It is an integral part of Cape Colony, annexed in 1871 and incorporated in 1877. It comprises an area of about 18,000 square miles. Kimberley, its principal town and its chief mining center, distant 620 miles by rail from Cape Town and 430 from Port Elizabeth, has a population of about 20,000, and is rapidly becoming a great stronghold of British power and influence throughout South Central Africa. Here was held the first "South African and Intercolonial Exhibition," in the year 1892. The diamond-fields of Griqualand West are the chief mineral wealth of Cape Colony. An African diamond was first found south of the Orange River, in the Hopetown district, early in 1867. It was eventually sold for $2,500. A much larger stone, obtained in the same locality in 1869, was sold, when cut down from 83 to over 46 carats, for $56,000. No other finds were made on the south of the Orange, but search elsewhere led to valuable finds, scattered over a vast area north of the Orange. Valuable river diggings were discovered at Pniel Kopje and Klipdrift (now Barkly), facing each other on the left and right banks of the Vaal. The diamonds of this district are said to be of purer water than any others. The diggings still yield over $200,000 a year, the total production down to 1893 having been considerably over $10,000,000.

The true placers, or dry diggings, where the stones occur *in situ*, and have consequently to be mined with costly appliances, lie clustered together about 24 miles southeast of Pniel, in a district less than 12 miles in circumference, close to the Orange Free State frontier. Here have been opened the four great "pipes," as they are called, of Bultfontein, Du Toit's Pan, De Beers, and Kimberley, the last, which gives its name to the neighboring town, being the richest diamond-mine in the world. The pipes, rising above the surface from 60 to 100 feet, are most probably extinct craters. They are found to broaden out to depths of over 2,000 feet, penetrating, in descending order, through a variety of rocks, down to the primitive granite and gneiss. The diamonds are found, not in the rock formations, but in the yellow and the lower-down blue eruptive matter which fills the pipes, and which is supposed to have been forced upward by the pressure of the underground gases. The stones are distributed in the blue rock, apparently in a certain regular order known to experienced miners. A peculiarity of the Cape diamond-fields, as compared with those of Brazil and India, is the high proportion of large stones that they have yielded. Several have been found weighing upward of 100 carats in the rough state. The famous "Stewart," found in an outside claim in 1872, weighed 288 carats, being exceeded in size by only three others in the whole world. At present there are no open workings, all operations being carried on by means of shafts and underground galleries, as in ordinary coal-mines. To control the output, and prevent a glut of the market, individual claims were gradually bought up by the larger capitalists, sometimes at enormous prices, and the whole of the diamond interest united in one amalgamated corporation. Owing to the great depth of the pipes, the mines may be regarded as practically inexhaustible. In 1889, 1890 and 1891 the output exceeded $20,000,000, while from 1867 to 1893 the total yield fell little short of $332,500,000.

Besides the diamond-fields and the copper-mines already mentioned, the extensive coal-measures of the Stromberg uplands, which the railway from East London crosses at a pass 5,750 feet high, contain a vast store of fuel for future use.

NATAL. The present colony of Natal was formerly an integral part of the Cape of Good Hope settlement. It was erected in 1856 into a separate colony under the British crown, and has been, since 1882, under a governor appointed by the crown. By a colonial charter granted in 1893, the governor appoints a cabinet of ministers, and, with their advice, a legislative council, or upper house, of 11 members. He also provides for the election, by the people, of a legislative assembly of 37 members. The colony has an area of about 20,460 square miles, with a coast about 200 miles in length. Of the land of the colony, 2,250,000 acres are reserved for native occupation, and 8,250,000 acres have been acquired, by grant from the crown, by Europeans. The leading crops are sugar, maize, wheat, oats, and other cereal and green crops, and tea-planting has been recently introduced. The coal-fields of the colony are of large extent, and rich beds of iron ore have been found in many parts. There are 399 miles of railway open, nearly all constructed and worked by the government. The main line extends from the port of Durban to the border of the Transvaal, 306 miles. An extension of 161 miles gives railway communication to Johannesburg. The population of Natal at the last census (1891) was 544,000. Durban, founded in 1846, on the only inlet accessible to shipping along the whole of the Natal coast, and the outlet for the whole trade of the colony, consists of two distinct quarters, connected by rail — Durban proper, on the north side of the basin, in which the water is only seven feet deep, and Port Natal, at the entrance. The population of Durban (Europeans, Zulus, Hindus, Arabs, Chinese, and other Asiatics) is about 30,000.

ZULULAND. Zululand, lying on the coast to the north of Natal, has an area of a little over 12,500 square miles, with a population, in 1893, of 857 whites and 163,447 natives. After the death of Cetywayo in 1884, and the Zulus proving unable either to establish orderly government or to resist encroachment by the Transvaal Boers, England interfered, and in May, 1887, constituted what remained of the old Zulu kingdom a British protectorate, administered by a resident commissioner under the governor of Natal. In 1895 this protectorate was extended by taking in the southern section of

Tongaland to the south limit of Portuguese East Africa.

ORANGE FREE STATE—SOUTH AFRICAN REPUBLIC. Two large Dutch states, lying inland in eastern South Africa. The Orange Free State, extending from the Orange River to the Vaal River, and the much larger South African Republic, extending from the Vaal north to the Limpopo, mark the final territorial and political result of the presence of a peculiar Dutch element in the original settlement of South Africa. The earliest formal act of possession at the Cape was that of two passing ships of the English East India Company in 1620, the year of the first planting of New England, in America; but this was not followed up by the British government, and the first permanent settlement was effected by the Dutch, in 1652, in sequel to compulsory explorations carried out, during the four years previous, by the crew of a Dutch vessel wrecked on the coast of Table Bay. The Dutch held undisturbed possession for over 140 years. The first Boers (pronounced Bûrs), or peasant farmers, began to arrive as early as 1654. They were mainly Dutch, but with a few Germans, and after the revocation of the Edict of Nantes (1685) a considerable number of French Huguenots were added, together with other Protestants (Waldenses) from the Piedmontese Alpine valleys. Owing to the great intelligence, energy, and agricultural skill of these non-Dutch immigrants, they took a leading part in the development of the colony, and to them is especially due the successful introduction of the culture of the vine. Having brought their families with them, they increased more rapidly than the Dutch, many of whom were officials and soldiers without families, who intermarried with the native women, and gave rise to the mongrel element still commonly known as "Bastards." Thousands of the present Boers are still proud of their Huguenot descent, and numerous family and geographical names remain to attest the former widespread influence of the French settlers. Nevertheless, the French and other non-Dutch settlers were gradually depressed under dominant Dutch rule, which, in 1724, officially banished all languages, except Dutch, from the schools and the pulpits. The Dutch attitude toward the natives was equally that of brutal selfishness, such as has everywhere appeared in Dutch colonial operations. Beginning by purchasing lands from the Hottentots, they employed, instead, forcible dispossession as they grew more powerful, and at last added the extreme measure of holding the owners of seized lands as slaves for tilling the soil. The Hottentots, accustomed only to the tending of flocks, proved inferior agricultural laborers, and were gradually replaced by negroes or negroid Bantus, mainly from the East Coast. The foreign slave-trade, for accomplishing this, began within 10 years of the foundation of the settlement, and was for a time so extensive that the black slaves outnumbered the free peasantry. With the falling off, later, of the importation of negro slaves, the number at the time of emancipation carried out by Great Britain in 1833 was not more than 25,000, scattered over the agricultural districts, and most of these have since been absorbed in the mongrel class, which consists of whites, Hottentots, and blacks.

The original purpose of the Dutch settlement being that of a fortified trading-station, and not that of a colony looking to territorial expansion, the colonial authorities tried to confine the plantation to a narrowly limited vicinity, even threatening with death and confiscation of property those who ventured to "trek" — that is, travel by wagon — in search of new settlements at a distance. To trek means to drag or draw. Dutch trekking was always done by means of huge wagons, drawn by long teams of oxen,—wagons which were immense schooners, covered and fitted to serve for both carrying and housing purposes. Not only could the trekker travel slowly onward at will, but he could tarry by the way for a season of hunting or fishing, or delay on account of weather, or even for a season long enough to plant and gather crops. Trekking became an irresistible movement away from the original Cape station, the continuance of which to the present time has not only created the two Dutch states mentioned, but has scattered the primitive Boer element throughout the greater part of South Africa, from the Cape northward to the Cunene River, and northeastward to the Limpopo.

At the time of the British occupation in 1806, the total population of about 75,000 was about one third Boers, one third pure and mixed Hottentot serfs, and one third negro slaves. The Boers regarded themselves literally as "the chosen people," with a divine, indefeasible right to ownership of "the cursed children of Ham." They resisted to the utmost the movement for the emancipation of the slaves, breaking out into open revolt in 1815, with extensive resort to trekking, and, when slavery was abolished in 1833, undertaking the so-called "Great Trek" of 1834, to carry their families, their slaves and their herds beyond the jurisdiction of the British authorities. Moving with immense wagons, which served as their dwelling-places, and driving before them such cattle as were not yoked in long files to their wagons, or tarrying in choice places for pasturage and for sufficient tillage of the ground to supply their food necessities, they moved steadily northward, out of reach of English control. Many went to Natal, but moved farther on when Natal was annexed by the British. In this way the Dutch Boers finally found, on the north side of the Orange River, a land of their own, which they developed into the Orange Free State, the present estimated area of which is 41,500 square miles, with an estimated population of 208,000, of which about 78,000 are whites. The proceedings of the Boers followed the plan of either dispersing or reducing to virtual servitude the natives whom they found on the soil; and even with concession to British demands in the matter of slavery, they still exclude the blacks from the franchise, from ownership of land, and from bearing of arms, and both pay them badly and treat them with great harshness.

The Orange Free State found its limit on the north at the Vaal River. Across the Vaal, by the advance northward of other trekkers, a second extensive settlement of Dutch Boers was made, and

this became the Transvaal, which, by the convention of London, Feb. 27, 1884, was recognized as the South African Republic, the total area of which is roughly estimated at 114,000 square miles, with a population, in 1890, of 680,000, 120,000 of whom are whites, probably about half of them Boers, and nearly all the rest English, or others of English speech. Rough, cruel, exterminating treatment of the natives has been the rule of the Dutch trekkers. Livingstone testified to having been a frequent eye-witness of the cruelties inflicted by the Boers on the native populations, making captives of children, preferably very young children, to be reared as slaves, and unhesitatingly carrying out these or other measures of Boer civilization, at whatever cost of bloody suppression of native resistance. Dwelling in rude habitations little better than hovels, on allotments averaging about 6,000 acres, often clothed in the skins of animals, and knowing little contact with others except that of the bloody hand with the natives, the Boer life tended to be one of savage isolation, absolutely barbarous, until the discovery of the gold-fields and the rapid development of mining and associated industries brought British civilization upon the scene, with the extraordinary recent development of Johannesburg in the Witwatersrand region, and of Barberton, the center of the Kaap gold-bearing region, near the Portuguese frontier. So late as 1891 Dutch resistance to the limitations of civilization manifested itself in an attempt to organize another trek in the direction of the Zambesi, with the view of founding a new Dutch republic somewhere beyond the Limpopo. Against this, prompt protest was effectually made to President Kruger, April, 1891, by Sir Henry Loch, the high commissioner at the Cape, plainly intimating that any attempt whatever to plant another Boer state within reach of British authority would be forcibly resisted. President Kruger's acceptance of this marked the close of Boer political expansion in South Africa. The Transvaal capital, Pretoria, planned to accommodate ten times the number, has 6,000 to 8,000 inhabitants. Its southern rival, Potchefstroom, 90 miles farther south, the first place founded in the Transvaal, and for some time the seat of government, and largest town in the state, has a population of about 5,000. Johannesburg has a population of more than 60,000, and a floating population of 45,000 in the gold-fields. Barberton numbers about 10,000. In the Orange Free State there are no large centers of population. The government of the Orange Free State is that of a popular assembly, the Volksraad, of 58 members, and of a president, with an executive council of 5. The capital is Bloemfontein. The Transvaal government consists of a parliament of two chambers, each of 24 members, and of a president with an executive council of five.

Gold-mining, carried on to a great extent in the various gold-fields, principally Witwatersrand and Barberton, is increasingly the overshadowing interest of the Transvaal. The total output for the first half of 1895 was $28,180,610. For the year 1894, 31 coal-mines were under development. Iron is also known to abound, and silver is worked in a mine close to Pretoria. The total mileage of railways open in September, 1895, was 424; under construction, 384; and projected, 381. Pretoria is, by rail, 1,040 miles from Cape Town. Telegraph lines within the Transvaal extend 1,952 miles.

TONGALAND. North of Zululand, the low-lying malarious coast region extending from Lake St. Lucia to Delagoa Bay, and known as Tongaland, had always been claimed by the Portuguese, although they had not entered it to make any permanent settlement. By an agreement of August, 1890, between England and Portugal, a line was drawn annexing the more northern part, 5,000 square miles, to Portuguese East Africa, and giving England the south part, with an area of 2,000 square miles. The extremely unhealthy climate, and the absence of mineral wealth, protects the natives, who are mostly peaceful agriculturists, from the encroachments of white settlers.

SWAZILAND. To the east of Tongaland, on the edge of the upland regions, and extending back from the Lebombo range to the Drakenberg, the border of the Transvaal, there had sprung up the little native state of Swaziland, through a successful assertion of independence by the people, whose chief was named Swazi. The rich pasture-lands and extensive gold-fields of the district, together with the desire of the Boers to push their limits as near as possible to the coast, led to efforts of encroachment by the Transvaal, the last result of which was a convention of November, 1893, between the British and Dutch authorities, by which Swaziland was annexed to the Transvaal. The right to make a railway through it to Kosi Bay, on the Tongaland coast, had a short time before been conceded to the Boers.

PORTUGUESE STATE OF EAST AFRICA. Portuguese East Africa extends from Kosi Bay, the north limit of British coast territory in South Africa, for about 1,400 miles northeastward to the Rovuma River, the south limit of German East Africa. It is divided into two nearly equal sections by the lower course of the Zambesi River. The southern section stretches from the coast for an average distance of some 200 miles inland to the east border of the Transvaal and the eastern limit of British Central Africa. This section is also carried up the valley of the Zambesi as far as Zumbo, more than 500 miles from the sea, and constitutes a Portuguese district nearly surrounded by British Zambesi. The northern section extends from the coast, for an average distance of 300 miles, to Lakes Nyassa and Shirwa and the River Ruo, beyond which a long north and south region constitutes a British Central African protectorate. The southern region is commonly designated Gazaland, and the northern, Mozambique. In 1891 the whole was constituted the State of East Africa, and the two sections designated Mozambique and Lourenço Marques. The collective area of the two provinces is about 620,000 square miles, with an estimated population of 1,500,000. There are several ports on the coast. Mozambique is the capital of the northern section, and Lourenço Marques of the southern. The latter has acquired special commercial and political importance as the terminus of the railway to the Transvaal

and the natural outlet of the Boer republic. The railway, 57 miles long, enters Transvaal territory at Komati Poort, where a junction is made with the South African system, including an extension undertaken by the Netherlands Company for an additional 290 miles to Pretoria, the Transvaal capital.

GERMAN EAST AFRICA. German East Africa, with a coast-line on the Indian Ocean extending from Cape Delgado nearly due north for about 480 miles to the mouth of the Umba, has an estimated area of 400,000 square miles, and a population of 2,900,000. It is shut in by British East Africa on the north, the Kongo State on the west, and British Zambesia and Portuguese East Africa on the south. It was only from the autumn of the year 1884 that German agents, disguised as needy travelers, passed over from the island of Zanzibar to the mainland and secured, or pretended to secure, treaties of annexation from local chiefs who were nominally vassals or subjects of the Sultan of Zanzibar, who was himself virtually under the protection of Great Britain. The German imperial government proceeded upon the "treaties" as accomplished facts, and forced the Sultan of Zanzibar to submit to the German claims. By two Anglo-German conventions, of 1886 and 1890, the Sultan was dispossessed both on the mainland and on all the contiguous islands except Zanzibar and Pemba, while the sultanate itself, thus limited to two islets with a joint area of scarcely 1,000 square miles, was declared (1890) a British protectorate. The vast interior region thus brought under German control has been very little penetrated except by Arab dealers in slaves and ivory. The German East Africa Company, chartered in 1885, administers, through an imperial commissioner, the district of the Usagara uplands, the finest district in the whole region. The imperial government has given substantial assistance in divers ways, including heavy subsidies for railways, steamers and public works. Lying close under the equator, and without any great extent of highlands or of lofty plateau, the chances of German colonial development are poor. There are probably not more than 30,000 square miles available for plantations and other branches of husbandry, and most of this lies in a decidedly unhealthy climate. Four fifths of the whole territory is a barren waste, almost uninhabited steppe, savanna, and bush. The total African possessions of Germany, both southwest and east, acquired in the years 1884 to 1890, have an estimated area of 884,810 square miles, and a population of 8,370,000. Developments of every kind, mineral, agricultural and commercial, have yet to be made. The total value of imports and exports of the German colonies and possessions in Africa during the year ending with June, 1895, was $6,149,165. The great bulk of the trade, especially in German East Africa, is carried on with other countries than Germany.

BRITISH SOUTH-CENTRAL AFRICA. Within less than 10 years vast changes have taken place in the political relations of South Africa, the chief result of which has been the creation of "British South-Central Africa," a territory nearly 1,000,000 square miles in extent, with a population approximately estimated at about 4,000,000. This new British possession occupies the whole of the central region between the German and Portuguese possessions on the west, and the Dutch republics and Portuguese East Africa on the east. It stretches from the north limit of Cape Colony uninterruptedly northward to the southern extremity of Lake Tanganyika, where it has the Congo Free State on the west and German East Africa on the east. This gives a British highway from the Cape through the Zambezi region and across the Zambezi-Congo water-parting into the Upper Congo basin. With the free navigation of Lake Tanganyika, which is likely to be secured by international agreement, British trade and enterprise secure 400 miles more of continuous highway and thereby reach a point only 150 miles distant from Mount Mfumbiro, which is now the southern limit of the advance of British influence through Egypt by way of the Nile. By an Anglo-German agreement of July, 1890, British passengers and goods have freedom of transit across the 150 miles from Tanganyika to Mfumbiro. England only needs to obtain, by agreement with the Congo Free State, on the west, and Germany, occupying to the east, a connecting link of territory 150 miles long, to be able to travel within her own borders down the center of Africa from the mouth of the Nile to the Cape of Good Hope. A principal aim of Great Britain has has been to secure herself in the possession of this continuous territory through the heart of Africa from Cape Colony in the extreme south to Lake Tanganyika in the extreme north of Zambezia. The Boers, soon after the restoration of the Transvaal (1881), threatened this by aggressive movements on the west,—movements made in secret concert with Germany in Southwest Africa. This led the British government, acting under an agreement with the native Bechuana chiefs, to constitute the greater part of South Bechuanaland a British crown colony. British interests were further safeguarded by a protectorate over North Bechuanaland, proclaimed in March, 1885, and by agreements, first with Germany, July, 1890, and later with Portugal, May, 1891, the result of which was to definitely fix frontiers toward the Congo Free State and the Portuguese and German West African possessions on the west, and German East Africa, Portuguese East Africa and the Transvaal on the east, the border of Cape Colony being the limit on the south. The whole of this vast region, between the Cape Colony border and Lake Tanganyika, is roughly divided into Bechuanaland south and north and Zambezia south and north. Across the whole of Zambezia, from the north border of the Transvaal, the map carries the general name Rhodesia, about one third of which, lying to the south and east of the Zambezi River, includes the two great native districts of Matabeleland and Mashonaland, within which the English settlements so far made are situated. It is in Mashonaland, to the northeast, that Salisbury, the Rhodesia seat of administration, has been founded. Buluwayo, the seat of Matabele uprising against English rule (1896), is the chief point of English occupation in Matabeleland. It was in 1890 that the chartered South Africa Company took formal possession of Mashonaland,

putting an end to the reign of terrorism which had prevailed in the region between the Limpopo and Zambesi for more than half a century, in consequence of Zulu invasion from the south. The Zulu headquarters for systematic plunder and massacre, first under Umsilikatzi, and later (after 1870) under Lobengula, was at Buluwayo. The death of Lobengula, Jan. 23, 1894, shortly after British occupation of Buluwayo, November, 1893, marked the conclusion of the enterprise for establishing British rule in Mashonaland and Matabeleland. The South Zambezian uplands, from the Limpopo, or north border of the Transvaal, to the Zambezi, are a northern extension of the Transvaal plateau, with an elevation of from 3,000 to 4,000 feet. They form one of the most highly favored regions in the whole of Africa. The scenery of the country is of the grandest type, with much that is indescribably lovely and beautiful. No part of South Africa offers such splendid advantages to the farmer as Matabeleland and Mashonaland. All European cereals, with most European tropical fruits and vegetables, thrive well. The climate is remarkably good. There is hardly a limit to the mineral wealth, especially gold, copper, and iron. It is believed that the largest and richest gold-field in the world, covering an area of several hundred square miles, is that of Mashonaland.

Zambezi Basin. All that part of the middle and upper Zambesi region, the altitude of which ranges from sea-level to 2,500, or at most 3,000, feet, was formerly a great inland sea, and it is not now sufficiently elevated to escape the malignant influences which are the result of tropical heat and large rainfall, together with extensive swampy tracts and sluggish streams. What may be called the Zambezi basin, in the narrower sense, is a hotbed of fever. A more favorable climate is found in the higher parts of Nyassaland and especially the Shiré highlands. It is in these highlands that the Arab and other slave-hunters had especially pursued their devastating work until the final success of British expeditions for its suppression, in March, 1894.

The inland regions of South-Central Africa were first reached by explorers, not from the Indian Ocean by the natural highways which the great rivers form, but by the long overland route from the Cape, through Bechuanaland and Matabeleland. Livingstone had led the way on this route in 1849 to 1856, and by 1870 had traversed in its entire length and breadth the whole of the vast Zambezi basin. After Livingstone the filling in of details of exploration was steadily prosecuted by travelers, hunters, traders, missionaries, scientific explorers, and mining prospectors. Mr. W. Montagu Kerr, in 1884, for the first time traversed, in a northeasterly direction, the whole region from the Cape across Zambezia to Lake Nyassa. The first detailed account of Matabeleland and Mashonaland was given by Mr. Kerr. The Matabele gold-fields were discovered in 1868, and the expeditionary efforts of the chartered South Africa Company were begun in 1890.

British Central Africa. To the north of the Zambezi, an immense region, the total area of which is officially stated at about 500,000 square miles, is known as British Central Africa. It has a native population of about 3,000,000 and a European population something over 300. Large portions of the region are wholly uninhabited, the native population being congregated for the most part in that portion of the territory where they can receive British protection against seizure by traders in slaves. What is known as the British Central African protectorate in the vicinity of Lake Nyassa, and extending toward the Zambezi, maintains an administration under which life and property are safe. The climate of this part of British Central Africa, though not favorable to the health of Europeans in general, is less unhealthy than that of the greater part of tropical Africa. The chief town is Blantyre, in the Shiré highlands, with a population of 6,000 natives and 100 Europeans. Zomba, on the Shiré River, is the seat of the administration. Coffee and rice are among the successful products of the region, and about one fourth of the ivory exported from Africa is from the vicinity of Lake Nyassa.

Central Africa. Central or tropical Africa, extending from the Zambesi to the bend of the Niger, or, roughly, between 18° S. and 18° N. lat., consists of some 7,000,000 square miles, double the size of Europe, or of Australia, or of Canada. England's share in Central Africa is roughly estimated at 2,000,000 square miles, and the total trade of the whole enormous area is approximately valued at $47,000,000.

In this immense central part of Africa there still remain native states not yet subjected by any European power, but supposed to be within the sphere of influence of one or another. A wholly unannexed region is that which extends from the western limits of Egypt across to the eastern French limit in the Sahara, and from central Soudan in the south to the country of Fezzan in the north. It contains a mountainous, uninhabited region, which the explorations of the European powers have not yet reached.

The total white population in the whole of Central Africa, inclusive of officials, missionaries, traders and others, is estimated to not exceed 6,000. Of the total exports from Central Africa, all but an insignificant fraction are products of the jungle, such as palm oil, palm kernels, groundnuts, ivory, caoutchouc, gums and similar articles, for which there is only a limited demand, and of which plentiful supplies are obtainable from other parts of the world. Central Africa is as capable as any other region on the face of the earth of producing coffee, cotton, sugar, tea, tobacco, cereals of all kinds, and cattle; but for the development of its capabilities an adequate white population is absolutely necessary. Certain regions in all parts of Central Africa are adapted to prolonged European residence, even if not suited to the development of European colonies. Blantyre, to the south of Lake Nyassa, has for years maintained a considerable population of English origin, who can, with proper care, keep their health. The Portuguese have lived for generations in West Africa, where the edge of the plateau comes well down to the coast, and on the southern section of Portuguese West Africa a flourishing Boer settlement has been established for years. It is claimed, and undoubtedly with justice, that instead of 6,000

Europeans, 600,000 could manage to live a vigorous and healthy life in Central Africa, and that there will be no lack of settlers as soon as the profit of residence there becomes apparent.

The territory secured by England in East Equatorial Africa, as a result of the dismemberment of the Zanzibar domain, has received the somewhat fantastic name of Ibea, a term formed by the initial letters of the full title, Imperial British East Africa. The Imperial British East Africa Company, under a royal charter dated September 3, 1888, obtained the same year from the Sultan of Zanzibar a strip of the Zanzibar coast. This was extended by a second concession in 1889 and a third in 1891, giving a total length of coast subject to the company of about 450 miles, with all the adjacent islands as far south as Zanzibar. From the coast British East Africa extends west to the border of the Congo Free State and the Congo-Nile water-parting. It probably exceeds in area 1,250,000 square miles, and has a population estimated at about 13,000,000. The country is opened up by means of exploring caravans carrying trade goods. The most advanced permanent posts occupied by Europeans are from 250 to 300 miles inland, where a healthy plateau has an elevation of 7,000 feet. Mombasa, on the coast, which has a fine harbor, is the seat of government. A good road has been constructed to connect Mombasa with Kibwezi, nearly 200 miles inland, where a mission is successfully carrying on the industrial education of the natives. A survey has been made for the construction of a line of railway, over 657 miles long, from the coast at Mombasa to Lake Victoria Nyanza. Mombasa is connected with the coast ports of the company by telegraph lines, and with Zanzibar by a submarine cable.* E. C. TOWNE.

AFRICAN LANGUAGES. See PHILOLOGY, Vol. XVIII, p. 780.

AFRICAN METHODIST EPISCOPAL CHURCH, an organization of colored Methodists, which withdrew from the care of the Methodist Episcopal Church in 1816. They elected the Rev. Richard Allen as their first bishop. In tenets and doctrine they follow substantially the parent body. Four academies, one university, and two weekly newspapers contribute to the advancement of the colored Methodists. In 1891, they returned to the census authorities the names of 4,150 ministers and 475,565 lay members. The question of amalgamation with the African Methodist Episcopal Zion Church has been seriously considered, and may be acted upon.

AFRICAN METHODIST EPISCOPAL ZION CHURCH, an offshoot of the African Methodist Episcopal Church, the result of a schism and secession in a New York congregation in 1820. Their first bishop was the Rev. Christopher Rush, chosen in 1838, under the title of superintendent. In 1891, the church numbered 3,650 ministers and 425,000 members. In doctrine and tenets they follow, in the main, the Methodist Episcopal Church.

AFRIKANDER, a term of Dutch origin, signifying a white man, more particularly one of Dutch descent, born on the African continent. It is used in contradistinction to the term *Uitlander*, which signifies one born in another country.

AFRIKANDER BUND OR BOND, an association, organized in 1879, and consisting of Afrikanders. It aims at the political independence of South Africa, and the formation of the United States of South Africa there.

AFTERGLOWS, the extraordinary brilliancy often seen in twilight colors after the sun has sunk to rest. Foreglows are the morning glories before actual sunrise. Observers have noticed the prevalence of such phenomena after great volcanic eruptions, and are inclined to ascribe the glows to the presence of an infinite quantity of microscopically minute particles suspended in the air.

AFTON, a town of Union County, in the southwestern part of the state of Iowa. It is situated on the banks of Twelve Mile Creek, in a fertile agricultural district, and on the Chicago, Burlington and Quincy railroad, 12 miles E. of Creston. A good private normal school and business college is located here. Population 1895, 1,144.

AGAMI. See TRUMPETER, Vol. XXIII, p. 594.

AGAMOGENESIS. See BIOLOGY, Vol. III, p. 686.

AGAPEMONE (*Gr.* "An abode of love"), the name given to a species of reconstructed Eden, founded in Somersetshire, England, in 1848, by Henry James Prince, an ex-minister of the Church of England. In practice, despite their pretensions, the Princeites, or "Lampeter Brethren," were fanatics and free-lovers. Prince claimed to be "God incarnate," free from all desire, and he and his devotees lived in voluptuous ease. The term is also used to denote the residence of any sect of free-lovers.

AGAPETÆ, the "beloved women" of the primitive church who lived with ascetic men, professing to observe lives of celibacy. This practice of spiritual love soon led to irregularities, and was condemned by the Lateran Council in 1139.

AGARDH, JAKOB GEORG, a Swedish botanist of note; son of K. A. Agardh; born at Lund, Sweden, Dec. 8, 1813. He was appointed professor of botany in the university of his native town, and wrote several standard works on botany.

AGARDH, KARL ADOLPH, a noted Swedish political economist and naturalist; born at Bastad, Sweden, Jan. 23, 1785. He entered the church in 1812, and in 1834 was consecrated bishop of Carlstad. He published three valuable treatises on seaweeds. Died at Carlstad, Sweden, Jan. 28, 1859.

AGARICUS. See MUSHROOM, Vol. XVII, p. 74.

AGASSIZ, ALEXANDER, American geologist and zoölogist, born in Neuchâtel, Switzerland, Dec. 17, 1835. He followed his father, Louis Agassiz, to the United States in 1849, graduated at Harvard in 1855, and received the degree of B.S. from the Lawrence Scientific School in 1857. Two years later he collected numerous specimens of fish, for the Harvard museum, while on a trip to California as an assistant on the coast survey. On his return in 1860, he served as assistant in the Museum of Comparative Zoölogy for five years. In 1866, he became

*The chief authority used for the above account of Africa to date, A. H. Keane's *Africa*, in *Sanford's Compendium of Geography*, is an admirable contribution to knowledge of the Dark Continent.

connected with the famous Lake Superior copper-mines, and developed the deposits of the Calumet and Hecla mines until they became the most valuable in the world. He was appointed chief curator of the museum on his father's death in 1873, a position he held until 1885. He has since been engaged in visiting foreign collections and museums, and in deep-sea dredging, making many important contributions to science. He is a member of numerous scientific societies, both in this country and in Europe, and the author of several scientific works.



A. AGASSIZ.

AGASSIZ ASSOCIATION, a scientific association organized at Lenox, Massachusetts, in 1879, for the purpose of stimulating interest in matters scientific. Originally confined by its founder, Mr. H. H. Ballard, to his pupils at the Lenox Academy, it was turned into a general organization in 1880, which has increased to a membership of about ten thousand, grouped in some one thousand chapters. A most valuable feature of the society is the interchange of scientific information, specimens, etc., by members corresponding with one another.

AGASSIZ, MOUNT, extinct volcano of Arizona, in Coconino County, a few miles north of Flagstaff, on the Atlantic and Pacific railroad, and at the head of the Little Colorado basin. It is one of the San Francisco mountains, and is 10,000 feet in height.

AGATHA, SAINT, a noble lady of Sicily. She is said to have resented insults of the prefect Quintianus, and to have suffered martyrdom at Catana, in the persecution of Christians under Decius, 251 A.D. The Roman and Anglican churches commemorate her martyrdom on February 5th.

AGAVE. See American aloe, under ALOE, Vol. I, p. 597.

AGE. Legal divisions of human life differ considerably in different countries, being sometimes arbitrary, and sometimes founded on nature. The whole period previous to 21 years of age is generally spoken of as infancy; but notwithstanding this general division, which is applied to both sexes, the ages of male and female differ for different purposes.

In England, a male at the age of 12 may take the oath of allegiance; at 14, consent or disagree to marriage, choose his guardian and be an executor; but when 21, is at his own disposal,—may alien and devise his lands, etc. A female at 7 years may be given in marriage, at 14 choose a guardian, at 17 be an executrix, and at 21 dispose of herself and her lands.

In Scotland, the marriageable age is 14 in males and 12 in females. Both sexes are of age at 21.

In France, 18 in males and 15 in females is full age; these are the ages at which they may respectively marry with consent of parents. At the age of 21 men are eligible for public office.

In the United States a person becomes of legal age when he or she is 21, males being able to contract marriage in different states at ages varying from 14 to 21 years, and females from 12 to 21 years of age. An American citizen cannot be a Representative before he is 25 years of age, Senator before 30, or President before 35. Between the ages of 18 and 45 the male citizen is liable to military service, and between 21 and 60, in most states, to service as juryman. In criminal law, no act done by a child under 7 years of age is a crime, nor an act done when between the age of 7 and 14, except it is shown that the child has sufficiently mature understanding to distinguish between right and wrong. See AGE, Vol. I, p. 278; also LONGEVITY, Vol. XIV, p. 857.

AGE OF CONSENT. Age-of-consent laws are those which are enacted by the legislatures of the various states providing that young girls under a certain age, therein designated, shall not be capable of consenting to carnal or illicit intercourse with the opposite sex. These laws provide that if a male person of sufficiently mature age to be chargeable with the crime of rape shall have illicit intercourse with a girl of less age than that named in the statute he shall be guilty of rape, and punishable in the same manner and to the same degree as though he had committed the offense with force and against the will of the girl. The old English laws, from which much of the law of the United States is derived, fixed the age of consent at 10, and later at 12 years, and consequently the early statutes of the various states of this country usually fixed the age as of one or the other of those periods of the English law. Within the last decade the laws fixing the age of consent have received radical changes, both in this country and in England, and the age has been fixed in England at 16 years, and in most of the states of this country at either 14 or 16 years. It has recently been increased in Florida to 17 years, and in Kansas and Wyoming to 18 years. This reform has not met with success in some states, but the modern tendency seems to be that the age of consent should be at least 16 years. In only 10 states is the age now less than 14 years. Recent investigations of the extent of crimes against young girls have aroused public interest, with the prospect that in other states laws may be passed to materially increase the age of consent.

AGENCY, is the relation between two or more persons, whereby one is authorized to act for and on behalf of the other, to a more or less limited extent, in the transaction of business affairs. The one thus employed is termed the agent, while the employer is termed the principal. Agency is a contractual relation, which may be either express or implied. Unauthorized acts of an agent become binding upon the principal, if ratified by him. Ratification will be presumed from the silence of the principal after notice of the act, or from acts inconsistent with a contrary presumption. Generally, all persons of sound mind, and of sufficiently mature age to transact the business required, including married women and minors, are legally qualified to act as agents. See AGENT, Vol. I, p. 280.

AGENDA, a term in theology, signifying practical duties, as distinguished from credenda doc-

trines or matters of faith. The term is also used to signify the church ritual, or the book of services. The service-books of the Lutheran Church are called Agenda.

AGENOIS, that part of the old province of Guienne, in France, which now forms part of the department of Lot-et-Garonne; area, about 1,080 sq. miles.

AGENOR, the name of six mythological celebrities: 1. A son of Neptune (Poseidon) and Libya; father of Cadmus, Phœnix, Cilix, Thasus, Phineus and Europa. He was twin brother of Belus, and became king of Phœnicia. 2. A son of Iasus, and father of Argus Panoptes, king of Argos. 3. Son and successor of Triopas, in the kingdom of Argos. 4. A son of Pleuron and Xanthippe and grandson of Ætolus. 5. A son of Phegeus, king of Psophis, in Arcadia. 6. The bravest of the Trojans, son of Antenor and Theano. He engaged in single combat with Achilles, but was rescued by Apollo.

AGGLOMERATE, OR VOLCANIC AGGLOMERATES. See GEOLOGY, Vol. X, p. 239.

AGGLUTINATE LANGUAGES. A term employed in comparative philology to denote those tongues in which no proper inflexions exist, but in which the pronouns are made to adhere to the root of the verb to form the conjugations, and in which the prepositions unite with substantives to form the declensions. In an agglutinate language, as the term itself imports, there must be no incorporation of the root and the adhering word; the two must simply lie side by side, "glued" together, without change in either. An agglutinate language is so termed in contradistinction to an inflexional language. The Turanian language of Asia is typically agglutinate, while the Aryan and Semitic tongues are essentially inflexional.

AGNADELLO, a village in the province of Cremona, northern Italy, 10 miles E. of Lodi, near which the French under Louis VII completely defeated the Venetians, May 14, 1509.

AGNES, SAINT, a celebrated Christian virgin and martyr of Rome. She is said to have been beheaded by order of Diocletian 303 A.D. Her martyrdom is commemorated on January 21st, by the Greek, Roman and Anglican churches.

AGNEW, CORNELIUS REA, an American aurist and oculist, born in New York City, Aug. 8, 1830. He graduated at Columbia College, and studied medicine at the College of Physicians and Surgeons. After he received his degree he held several important medical posts, one being that of director of the New York State Volunteer Hospital. In 1868 he established an ophthalmic clinic in the College of Physicians and Surgeons, and later founded the Brooklyn and Manhattan Eye and Ear hospitals. For years Dr. Agnew was connected with the state hospital for the insane at Poughkeepsie, and was deeply interested in the educational institutions of New York City. He contributed numerous papers to medical journals on diseases of the eye and ear. He died in New York City, April 18, 1888.

AGNEW, DANIEL HAYES, American surgeon, born in Lancaster County, Pennsylvania, Nov. 24, 1818. After studying at Jefferson and Newark colleges he graduated in medicine at the University of Pennsylvania in 1838. He lectured in the Philadelphia School of Anatomy, and established the School of Operative Surgery. Subsequently he became a surgeon in the Philadelphia Hospital, and also in the Pennsylvania Hospital. For several years he was a professor in the medical department of the University of Pennsylvania; and he was also, for some time, a surgeon at Will's Ophthalmic Hospital. Dr. Agnew was connected with numerous cases of great public and scientific importance, the best known being that of President Garfield; and he has made many valuable contributions to medical literature. Among his works are *Practical Anatomy* (1867); *Anatomy and Its Relation to Medicine and Surgery;* and *Principles and Practice of Surgery* (1878). Died March 22, 1892.

AGNI, a Hindu deity; the god of fire, a bearer of incense and purifier, and a mediator between man and gods. See BRAHMANISM, Vol. IV, pp. 206–208.

AGNOMEN, an additional name given by the ancient Romans on account of some quality, action, virtue or accomplishment; thus P. Cornelius Scipio received the agnomen of Africanus.

AGNOSTICISM. This term was first used by T. H. Huxley, about 1869, to signify that state of mind toward the supernatural which neither accepts nor denies its existence, but holds that its problems are not the subject of demonstration or scientific investigation. It is generally accompanied by a very positive scepticism, since the agnostic temperament does not recognize faith as a means of information or a source of certitude. Strictly, matters of religious belief or speculative philosophy he places in the realm of the unknown, with a strong inclination to pronounce them unknowable. The term is a derivation from a Greek word meaning "without knowledge," and the religious bias that gave rise to its coinage is disclosed by the fact that Huxley took it from the inscription on an Athenian altar, which, as St. Paul described it, was dedicated to the "unknown god."

Agnosticism differs from the scepticism of the seventeenth century, in that, on the one hand, it is not so dogmatic in its denials, and on the other hand, that its scope is wider. It does not deny, for it admits, that there are many facts, as of consciousness, that do not as yet submit themselves to the methods of experimental science; but it holds judgment in suspense concerning spiritual things, and often is hopeless, as to them, of passing beyond mere opinion or hope. It is of broad scope, for it challenges all the conclusions of metaphysics and belief, although it admits the value of hypothesis as a means of directing and testing the investigations of phenomena. The real root of agnosticism is in inductive or experimental philosophy, under which a law of nature, once established, can be verified by the ability of any one to reproduce the same phenomena by the same methods. To the true disciple of this school the "Absolute" or the "First Cause" must ever remain unknowable, since in nature causation is always reducible to a series of sequences or a recurrent order of phenomena. To this chain there is no conceivable logical end.

The prevalence of the methods of inductive science, and the fruitfulness thereof in enlarging the horizon of human knowledge, has made this form of scepticism very common, not only among men engaged in investigation of material forces and order, but among those who from a lower plane catch the contagion of their thought. For a further exhibition of the historical relations of agnosticism and of its nature, see SCEPTICISM, Vol. XXI, p. 383.

AGONISTICI, a sect of ascetic Christians who lived in northern Africa in the fourth century. "Wrestling," as the Greek original of their name imports, with the world, the flesh and the devil, they renounced matrimony, and esteemed it wrong to work. They were condemned at a council of the church, and persecuted out of existence by Pope Melchiades.

AGOULT, MARIE CATHERINE SOPHIE, COMTESSE D', a French authoress; born at Frankfort-on-the-Main, Germany, Dec. 31, 1805, whither her father, the Count de Flavigny, had fled for safety during the Reign of Terror. She was educated at a convent in Paris, and in 1827 married the Comte d'Agoult. She soon left her husband and lived with the composer Liszt, to whom she bore three daughters, the eldest of whom married Émile Ollivier; the second, Guy de Charnacé; and the third, first, Hans von Bülow, and afterward, Richard Wagner. Marie d'Agoult had a fancy for authorship, and wrote under the pseudonym of Daniel Stern. Her best work is her *Esquisses Morales et Politiques* (1849); and among her works may be mentioned *Nélida; Lettres Républicaines; Histoire de la Révolution de 1848* (1851); and *Mes Souvenirs, 1806–1833*. She died in Paris, March 5, 1876.

AGREEMENT, an understanding on the part of two or more persons to which they have assented, wherein mutual promises are made to perform some act. The term has much the same significance as contract, but is of more extensive application. An agreement might not in some cases be a contract, as because it did not fulfill the requirements of the law of the particular place at which it was made; but a contract must always be an agreement. But the term agreement is seldom applied to specialties or contracts under seal. The term promise, which is a necessary element of an agreement or contract, is of narrower application than either, and refers to the engagement or undertaking of a party without regard to the consideration or the undertaking of the party to whom the promise is made. To constitute a valid agreement, there must be a consideration, the parties must assent to the terms of the agreement with the full knowledge thereof, and the object to be attained must be lawful. The rules of law having applications to contracts apply also to agreements. See CONTRACT, Vol. VI, pp. 322–24.

AGRICULTURAL COLLEGES are institutions for instruction in the science and practice of agriculture. The first governmental aid extended to schools of this class in the United States was an appropriation by Congress of 30,000 acres of public land for each Senator and Representative, to be applied in the states which they severally represented. This bill was passed by the Thirty-seventh Congress, approved by President Lincoln, July 2, 1862, and was contemporaneous with the act establishing an agricultural commission. Provision was made that such states as had public lands subject to sale at private entry at $1.25 per acre should take their apportionment in this land; but where the state had not such land, the government was to issue scrip authorizing the holder to locate public lands subject to sale at private entry elsewhere. These appropriations passed under the control of the legislatures of the several states, limited, however, by the act of Congress as to the disposition to be made thereof, and of the application of the proceeds. The lands and scrip were to be sold, and not more than 10 per cent of the fund arising could, at the discretion of the legislature, be devoted to the purchase of lands for sites of experimental farms. All of the proceeds not thus invested were to be placed in stocks yielding not less than five per cent, and the interest arising therefrom was to go to "the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts," in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in several pursuits and professions in life. Additional Congressional aid was extended in 1890, by an appropriation to cover the cost of establishing and maintaining experiment stations in the several states. See AGRICULTURAL EXPERIMENT STATIONS, in these Supplements. The states that had lands within their own borders subject to entry received 1,770,000 acres of land. The states that had not public lands subject to entry received scrip in an amount equivalent to 7,830,000 acres, making the total appropriation, under the act of 1862, 9,600,000 acres. The value of this land, at the minimum price of $1.25 per acre, was twelve million dollars, but it is estimated that these grants have realized to the states more than thirty million dollars. In addition to the foregoing, provision has been made for agricultural colleges in the new states of North Dakota, South Dakota, Montana, Washington, Wyoming and Idaho by the appropriation of 90,000 acres to each, except in the case of South Dakota, to which 120,000 acres have been given.

In these colleges the course of instruction covers a course of four years. The curriculum embraces chemistry, botany, geology, zoölogy, entomology, horticulture, veterinary science, the various interests associated with theoretical and applied agriculture, as well as language, literature, history and general science. Tuition is generally free, so that the living expenses of the student constitute the only expense, and this may be reduced to a minimum by exercising the privilege of devoting certain specified hours to remunerative labor. On the continent of Europe agricultural colleges have been in existence for almost a hundred years. They are especially favored in Germany, where there are several hundred in active and successful operation. The best results have

come from those institutions where the course of instruction is some special branch of agricultural education, as, for instance, the cultivation of meadows, the scientific methods of irrigation, means of reclaiming swamp-lands, the growth of fruit-trees, apiculture, and kindred subjects of vital interest to the farmer. The resulting benefits are illustrated by the fact that in Germany, Belgium and France, where these schools exert a great influence, the lands now produce almost double the amount per acre raised before their institution, while in the United States, where non-methodical methods usually prevail, the annual crops are almost everywhere growing less in average per acre. England presents a state of affairs similar to that of the countries mentioned, and maintains many colleges devoted solely to agricultural education.

In the United States the same degree of benefit has not as yet attended the establishment of the colleges that has been realized in foreign countries. The governmental aid has been so liberal and abundant as to give them a fair test; yet it cannot be said that they have proved successful, or that the results attained have been wholly satisfactory. Students of agriculture have given much thought and attention to the matter, and are agreed that the instruction given is not sufficiently practical, and does not meet the requirements of the farmer. The graduate is qualified for a position more remunerative than to that of the farm-laborer, but has not that intimate knowledge of farm-life that enables the husbandman to so manage his affairs as to make of the business a success.

Herewith is given a list of colleges of agriculture and the mechanic arts endowed by the acts of Congress of July 2, 1862, and Aug. 30, 1890.

Alabama Agricultural and Mechanical College, Auburn, Alabama.
University of Arizona (agricultural and mechanical department), Tucson, Arizona.
Arkansas Industrial University, Fayetteville, Arkansas.
University of California (agricultural and mechanical department), Berkeley, California.
Colorado Agricultural College, Fort Collins, Colorado.
Sheffield Scientific School (Yale University), New Haven, Connecticut.
Delaware College (agricultural and mechanical department), Newark, Delaware.
Florida Agricultural College, Lake City, Florida.
State College of Agriculture and Mechanic Arts (University of Georgia), Athens, Georgia.
University of Idaho, Moscow, Idaho.
University of Illinois (agricultural and mechanical department), Urbana, Illinois.
Purdue University of Indiana, Lafayette, Indiana.
Iowa Agricultural College, Ames, Iowa.
Kansas Agricultural College, Manhattan, Kansas.
Kentucky Agricultural and Mechanical College, Lexington, Kentucky.
Louisiana State University (agricultural and mechanical department), Baton Rouge, Louisiana.
Maine Agricultural and Mechanical College, Orono, Maine.
Maryland Agricultural College, College Park, Maryland.
Massachusetts Agricultural College, Amherst, Massachusetts.
Massachusetts Institute of Technology, Boston, Massachusetts.
Michigan State Agricultural College, Agricultural College, Michigan.
University of Minnesota, Minneapolis, Minnesota.
Agricultural and Mechanical College of Mississippi, Agricultural College, Mississippi.
University of Missouri (agricultural and mechanical department), Columbia, Missouri.
Montana Agricultural College, Bozeman, Montana.
University of Nebraska (agricultural and mechanical department), Lincoln, Nebraska.
State University of Nevada (agricultural and mechanical department), Reno, Nevada.
New Hampshire College of Agriculture and Mechanic Arts, Hanover, New Hampshire.
Rutgers Scientific School, New Brunswick, New Jersey.
College of Agriculture and Mechanic Arts, Las Cruces, New Mexico.
Agricultural College of Cornell University, Ithaca, New York.
North Carolina College of Agriculture and the Mechanic Arts, Raleigh, North Carolina.
North Dakota Agricultural College, Fargo, North Dakota.
Ohio State University (agricultural and mechanical department), Columbus, Ohio.
Oklahoma Agricultural College, Stillwater, Oklahoma.
State Agricultural College of Oregon, Corvallis, Oregon.
State College, State College, Pennsylvania.
Rhode Island College of Agriculture and Mechanic Arts, Kingston, Rhode Island.
Clemson Agricultural College, Fort Hill, South Carolina.
State Agricultural College of South Dakota, Brookings, South Dakota.
University of Tennessee (agricultural and mechanical department), Knoxville, Tennessee.
Agricultural and Mechanical College of Texas, College Station, Texas.
Agricultural College, Logan, Utah.
University of Vermont and State Agricultural College, Burlington, Vermont.
Virginia Agricultural College, Blacksburg, Virginia.
Washington Agricultural College and School of Science, Pullman, Washington.
West Virginia University (agricultural and mechanical department), Morgantown, West Virginia.
University of Wisconsin (agricultural and mechanical department), Madison, Wisconsin.
University of Wyoming (agricultural and mechanical department), Laramie, Wyoming.

The following list shows the institutions for the education of colored students in agriculture and the mechanic arts receiving the benefits of the act of Congress of Aug. 30, 1890:

State Normal and Industrial School, Normal, Alabama.
Branch Normal College of Arkansas Industrial University, Pine Bluff, Arkansas.
Agricultural College for Colored Students, Dover, Delaware.
State Normal and Industrial College for Colored Students, Tallahassee, Florida.
Georgia Industrial College for Colored Youths, College, Georgia.
State Normal College, Frankfort, Kentucky.
Southern University, New Orleans, Louisiana.
Alcorn Agricultural and Mechanical College, Westside, Mississippi.
Lincoln Institute, Jefferson City, Missouri.
Agricultural and Mechanical College for the Colored Race, Greensboro, North Carolina.
Claflin University, Orangeburg, South Carolina.
Prairie View State Normal School, Prairie View, Texas.
Hampton Normal and Agricultural Institute, Hampton, Virginia.
West Virginia Institute, Farm, West Virginia.

AGRICULTURAL EXPERIMENT STATIONS. Methodical study, under government auspices, of the farmer's problems was scarcely known before the second half of the nineteenth century.

A hundred years earlier, Arthur Young (See Vol. XXIV, p. 755) conducted, at his own expense, an experimental farm at Stamford Hall, Essex, with results of greater value to Great Britain than to his purse. His travels in all parts of the United Kingdom and in France, and his publications of experiments and observations, showed how great a field of systematic research there was to be possessed. It was not until 1843 that the private experimental farms of Sir John Bennett Lawes at Rothamstead, and of Rev. Mr. Smith (c.f. Vol. I, p. 342) at Lois Weedon, again aroused public attention in any effectual way to the advantages of the methodical study of agriculture. It was obvious, however, that what enthusiastic men of wealth might do in the way of experiment was out of reach of the tenant farmer of that day. If anything were to be done to increase the products of the land, or render farming more profitable for the great body of agriculturists, the government or some powerful organization must intervene. The gradually increasing depression of the farming interest became a matter of political importance, and Parliament, in 1889, created a Board of Agriculture, one of whose principal duties was to collect and diffuse technical information, and it has many of the research functions of the Department of Agriculture in the United States. Still more recently a National Agricultural Union was formed, and it opened a large experimental farm, designed especially to test the raising of crops not generally indigenous, on a scale sufficient to determine their industrial value. While actual experiments in the field, as distinguished from laboratory work, are carried on by the agricultural colleges at Cirencester, Downton and near Carlisle, in England, the chief experimental farm of the realm is that of the Royal Agricultural Society at Woburn, in Bedfordshire.

In France, agriculture is fostered by a special department of state, and it has long maintained sheepfolds and other stock-farms, and carried on experiments pertinent to changing farm problems. In Germany an experimental station was established, in 1851, at Möckern, near Leipsic, in Saxony, from which has grown an important, and perhaps unequaled, system of government experimental farms.

In the United States the development of these stations was closely connected with the agricultural colleges founded on government land grants. These land grants were made by Congress in 1862, and resulted in the establishment of agricultural colleges, or agricultural departments in some established college, throughout the states of the Union. Some of these colleges had purchased farms, and these necessarily became experiment stations, but each was a law unto itself, both as to the scope and the methods of its work. National legislation to foster these stations, and to promote some sort of system among them, began with an act of Congress passed in 1887. It provided for the establishment of experiment stations in connection with each college, or agricultural department of a college, enjoying the proceeds of the land grants of 1862 and 1867, or that should be established in accordance therewith. It was further provided that where any state or territory maintained or created two such colleges or experiment stations, the Congressional grant of money made by the act should be divided between them, unless the legislature otherwise directed. A sum of fifteen thousand dollars a year for each state and territory was ordered to be paid out of the United States treasury to officers appointed by law in each state and territory to receive the same, in quarterly installments. To secure uniformity of methods and results in the work of the stations, forms were to be provided by the commissioner of agriculture (now the Department of Agriculture) for use at each, and indications to be given of desirable lines of investigation, and generally he was to promote the purposes of the act by advice and assistance. On the other hand, stated reports from each station are required to be made to certain designated officials of the general government, and copies to be sent to every other experiment station. It is expressly stated that the act shall not be held to modify the legal relation between any state or territory and any of the colleges to be benefited. The grants of money named were to become available when a legislature had formally assented to the purposes of the act.

The objects of these experiment stations are declared to be "to conduct original researches or verify experiments on the physiology of plants and animals, the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific or economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly upon the agricultural industry of the United States as may in such case be deemed advisable, having due regard to the varying conditions and needs of the respective states or territories."

It was also required that each station should publish reports of progress, or bulletins, at least every three months, and that these documents should be furnished on application to any member of the farming community, so far as the income of the station would allow. At the passage of this act there were 17 experiment stations in existence, in as many states. There are now no states or territories without them, and in some states there are two. To carry out this act Congress appropriated $585,000 for the first fiscal year. In 1890 further provision was made to increase the allowance at the rate of $1,000 a year for 10 years; that is, until the maximum grant reached $25,000 per annum to each state or territory. Provision was further made that no discrimination of color

should be made by any legislature in distributing the government grants, but that the establishment of separate stations for whites and colored persons should not be held to be a prohibited discrimination, if each shared alike in the bounty.

Under this fostering legislation there has been a great accumulation of information, based upon carefully recorded and tabulated experiments, concerning agricultural entomology, soils, diseases of plants and animals, the relative values of fertilizers, management of crops and live-stock, restoration of worn-out lands, drainage, irrigation and methods of farming. Any agriculturist may obtain publications of the stations gratuitously, by writing to the director of the station in his state or territory.

The Department of Agriculture itself carries on laboratory and field experiments, both in Washington and at three or four points scattered in the country, with a view to climatic conditions; but the field-stations thus established are usually maintained by contract with some skillful person or farmer, who undertakes to carry out instructions from the department. These instructions commonly relate to some specific inquiries; as researches upon phylloxera, black-rot, and other obstacles to profitable viticulture, were made at Vineland, New Jersey, as other investigations have been made elsewhere.

Below is a list of the experiment stations established by law existing in the United States in 1895. Their support involves an expenditure of about one million dollars a year, of which one sixth is borne by the several states and territories, and the rest by the general government.

| State. | Town or Post-office. |
|---|---|
| Alabama, | Auburn. Uniontown. |
| Arizona, | Tucson. |
| Arkansas, | Fayetteville. |
| California, | Berkeley. |
| Colorado, | Fort Collins. |
| Connecticut, | New Haven. also the Storrs School. |
| Delaware, | Newark. |
| Florida, | Lake City. |
| Georgia, | Griffin. |
| Illinois, | Champaign. |
| Indiana | Lafayette. |
| Iowa, | Ames. |
| Kansas, | Manhattan. |
| Kentucky, | Lexington. |
| Louisiana, | New Orleans. Baton Rouge. Calhoun. |
| Maine, | Orono. |
| Maryland, | College Park. |
| Massachusetts | Amherst (2). |
| Michigan, | Agricultural College P. O. |
| Minnesota, | St. Anthony Park, near Minneapolis. |
| Mississippi, | Agricultural College P. O. |
| Missouri, | Columbia. |
| Nebraska, | Lincoln. |
| Nevada, | Reno. |
| New Hampshire | Hanover. |
| New Jersey, | New Brunswick (2). |
| New Mexico | Las Cruces. |
| New York, | Geneva. Ithaca. |
| North Carolina, | Raleigh. |
| North Dakota, | Fargo. |
| Ohio, | Columbus. |
| Oklahoma, | Stillwater. |
| Oregon, | Corvallis. |
| Pennsylvania, | State College P. O. |
| Rhode Island, | Kingston. |
| South Carolina, | Fort Hill. |
| South Dakota, | Brookings. |
| Tennessee, | Knoxville. |
| Texas, | College Station. |
| Utah, | Logan. |
| Vermont, | Burlington. |
| Virginia, | Blacksburg, |
| Washington, | Pullman. |
| West Virginia, | Morgantown. |
| Wisconsin, | Madison. |
| Wyoming, | Laramie. |

D. O. Kellogg.

AGRICULTURAL SOCIETIES. See Farmers' Organizations, in these Supplements.

*AGRICULTURE IN THE UNITED STATES. The word *agriculture* is not found in Shakespeare nor in the Bible. Its first occurrence, so far as is known, is in Philemon Holland's translation of *Plutarch's Morals*, published in 1603, where reference is made to "agriculture and husbandry." It is also found in Sir Thomas Browne's *Vulgar Errors*, published in 1646, and with increasing frequency from that time to our own. In its primary sense it means merely the tillage or cultivation of the ground, but, like the word husbandry, which it has largely superseded, it is now understood as embracing all the various industrial arts that are employed in the raising and preparation for the primary market both of the cultivated products of the soil and of domestic animals and animal products. In this popular acceptation of its meaning it certainly makes good its claim to be the foundation of human industry and prosperity. As providing in their primary form the means of human subsistence, it gives employment to a large proportion of the human race, and in its later and more scientific application it is laying under contribution departments of human knowledge that less than a generation ago were scarcely recognized as having any connection with it.

Historical. On the North American continent the beginnings of agriculture were naturally as small as those of colonization. In our own times the United States, after supplying the wants of its own large population, has exported upward of five and one half billions of dollars' worth of agricultural products within a period of ten years, and yet, of all the products that go to the making up of these gigantic exports, only two—maize and tobacco—were found growing in the country on the landing of the first settlers, either in Virginia or on Plymouth Rock. Almost all those numerous products of the soil which now flourish as in their natural habitat, and constitute so large a proportion of the agricultural wealth of the country, have been introduced from abroad. The potato was introduced into that portion of the colony of Virginia which is now North Carolina in the latter part of the sixteenth century. The Mayflower Pilgrims sowed barley, peas and beans, along with the maize given them by the Indians and thenceforth called Indian corn, in the spring following their landing. Wheat, rye and

*Copyright, 1896, by The Werner Company.

oats had already been introduced into Virginia, buckwheat was brought into the country by the Swedes and Dutch, and the year 1628 saw the introduction of hops. In the colony of Massachusetts the cultivation of flax or hemp was made compulsory in 1639, in Connecticut in 1640, and in Virginia, where the domestic manufacture of linen thread was likewise compulsory, in 1662; Pennsylvania, Maryland, and other colonies making similar enactments. As regards farm-animals, the New England colonists imported a bull and three heifers in 1624, and 140 head of cattle in 1629. In 1611, however, or nine years before the landing on Plymouth Rock, 100 head of cattle were imported into Virginia. These are examples of the fragmentary information relative to the agriculture of colonial times that has come down to us with the stories of the early Indian wars, of the religious animosities of fanatics, and of the hardships endured by the settlers. One thing, however, is certain: the colony of Virginia, whether from its earlier establishment or its less rigorous climate, or both, reached a point at which it had products to exchange for those of other countries at a much earlier date than did the colony of Massachusetts. As early as 1648 Virginia was exporting, among other agricultural products, an average of no less than 1,500,000 pounds of tobacco per annum, or enough to load a solid freight train of 45 cars, as we have them to-day. In 1729, 1,813 bushels of flaxseed, valued at the equivalent of $1.14 per bushel, were exported from Pennsylvania to Ireland and Scotland, and within the next 25 years the flaxseed exports of Connecticut alone attained an annual value of £80,000, representing, in all probability, not far from 400,000 bushels of seed. There was, however, no really important development in the agriculture of this country until after the Revolution, when concerted measures for its improvement were first taken. In 1784, agricultural societies were established in the city of Philadelphia and the state of South Carolina; in 1791 New York followed suit, and in 1792 Massachusetts did likewise. About this period there were many improvements in farm implements and machinery, perhaps the most notable being Whitney's cotton-gin, which gave to the cultivation of cotton in the South the greatest impulse it has ever received, the annual production increasing from 2,000,000 to 40,000,000 pounds within ten years. Before the first quarter of the nineteenth century had passed, the influence of the agricultural newspaper was added to that of the agricultural society, and before 1835 both mowing and reaping machines had been sufficiently perfected to give promise of the revolution they were destined to effect in the saving of labor. This brings us to the period at which a United States census embraced, for the first time, an inquiry into the condition of the agricultural interests of the country. Six successive decennial censuses have since made more or less elaborate investigations of the development of our agricultural resources,—a development that more than half a century ago was beginning to excite the astonishment of the civilized world, and of which it is not too much to say, that during the last twenty years it has constituted one of the most interesting and important chapters in human history.

United States Farms. Nearly 2,000,000 new farms, containing considerably over 200,000,000 acres of land, were added to the agricultural domain of the United States between 1870 and 1890. The total number exceeding three acres in extent (except where five hundred dollars' worth of products had been sold from off the farm during the year) on June 1, 1890, was 4,564,641, containing a total area of 623,218,619 acres, an average of 137 acres each, as compared with 134 acres in 1880,—an increase in average size for the first time in American history. Of this area, 357,616,755 acres were improved, the acreage unimproved constituting 42.6 per cent of the whole, as compared with 46.9 per cent in 1880. It was wholly in the West and South that the large accession to the number and acreage of farms took place between 1880 and 1890, every New England state, together with New York, Pennsylvania and New Jersey, showed a falling off both in the number and area of its farms. On the other hand, Texas and the Dakotas added over 15,000,000 acres, Nebraska over 11,000,000 acres, Kansas over 8,000,000 acres, Minnesota and Iowa over 5,000,000 acres, California nearly 5,000,000 acres, and Arkansas nearly 3,000,000 acres to their respective farm areas during the period above mentioned. It certainly did not require the aggravation of an era of diminished exports and unremunerative prices to seriously disorganize the farming interests of the country, in the face of this great and sudden shifting of the agricultural center of gravity. As regards the total number of farms, Ohio is well in the lead, with 251,430, followed by Illinois, Missouri, New York, Iowa, Texas and Pennsylvania, in the order named, and each with upward of 200,000 agricultural holdings. The other extreme is found in Arizona, Nevada, and the District of Columbia, with 1,426, 1,277 and 382 farms, respectively. Of the entire number of farms, 71.6 per cent are cultivated by owners, 10 per cent are rented for money, and 18.4 per cent are rented for share of products. The largest proportion cultivated by owners is found at the two extremes of the country, New England and the Far West, while the largest proportion rented, whether for money or shares, is found in the South; South Carolina, Georgia and Mississippi, in particular, having more than half their farms rented. The total value of the farms (land, fences and buildings only) of the United States, as reported to the eleventh census by the farmers themselves, was $13,279,252,649, an average of $21.31 per acre, or $2,909 per farm. Of the farms occupied by their owners, 2,255,789 were free of encumbrance, and 886,957 were mortgaged. Of these holdings, the largest percentages free of encumbrance were, without an exception, found in the South, while the largest percentages encumbered were in Iowa, Kansas, Nebraska and South Dakota, in which states the number of encumbered farms exceeds that of the unencumbered. The total encumbrance on farms occupied by their owners was $1,085,995,960, or 35.55 per cent of their reported value. The total annual interest charge was $76,728,077, and the average annual rate of interest 7.07 per cent, ran-

ging from 5.43 per cent in Pennsylvania to 12.61 per cent in Arizona. The total value of the implements and machinery on farms at the last census was $494,347,457, an increase of nearly $90,000,000 in 10 years. It is an interesting fact that, notwithstanding the enormous developments that have taken place in Western agriculture, New York and Pennsylvania still lead all other states in this important feature of farm equipment. The latter state, however, is closely followed by Iowa, and it will not be surprising if this last-mentioned great and rapidly growing commonwealth shall have passed the Keystone State in this particular, as it has already done in almost every other relating to agriculture, by the end of the nineteenth century. With one or two exceptions, the Southern states and the grazing states of the Far West appear to be the most poorly equipped in this important respect, many of them having not more than one dollar's worth of implements and machinery for every three, four, or five acres of land in farms.

FARM PRODUCTS. The products of the farms of the United States in the year preceding the census of 1890 were valued by the farmers themselves at no less than $2,460,107,454, and in view of that well-known tendency of farmers to underestimate the quantities and values of products consumed upon the farm, it is not improbable that the figures quoted are several hundred millions too low. A careful estimate of the value of the vegetable products alone for the year 1895 places them at $2,100,000,000, and that the amount would be increased to $3,000,000,000 or more by the addition of the meat, wool, dairy products and poultry, admits of no doubt.

CROPS. Although no other country in the world possesses so great a diversity of soil and climate as does the United States, and, accordingly, none can compare with it in diversity of agricultural productions, the most conspicuous and significant feature of its agricultural development is, after all, its annual production, on a scale absolutely without parallel in the history of the world, of those important products of the temperate zone which constitute the principal food-supply of a large portion of the human race.—*Cereals.* The total production of corn, wheat, oats and barley in the United States in 1895 was 3,529,757,808 bushels,—an amount slightly in excess of the total production of cereals (including rye and buckwheat) at the census of 1890, over 900,000,000 bushels greater than that reported in 1880, and well on toward three times that reported at the census of 1870. The center of cereal-production has not only been gradually moving westward since the first settlement of the country, but it has always been in advance of the center of population, and so far, at least, as the last 50 years are concerned, it has gained upon the westward movement of population with each successive decade. It is now west of the Mississippi River, since not only did the trans-Mississippi states and territories add over 23,000,000 acres to their cereal-producing area between 1880 and 1890, but the states east of the river, so far from keeping pace with this enormous increase, withdrew nearly 2,000,000 acres from cereal cultivation. Of every 100 acres devoted to cereals at the last census, 51.41 acres were under corn, 23.95 under wheat, 20.20 under oats, 2.30 under barley, 1.55 under rye, and .59 under buckwheat. As between the different states, however, the widest variations obtained, many of the Southern states having almost their entire cereal acreage in corn, while California and Washington had three fourths of theirs in wheat, and Maine, Montana and Wyoming had almost as large a proportion in oats.—*Corn.* Maize, or Indian corn, was cultivated by the Indians before the advent of the white man. It formed part of the first little patch of ground planted at Plymouth, and its production has increased with the development of agriculture in general, until three times between 1889 and 1896 the annual crop has exceeded two billions of bushels. Its enormous production illustrates, as does that of no other single crop, the wealth of that vast region which, under the operation of our liberal land laws, has been brought under cultivation within the last 30 years. The area devoted to corn in 1895 was 82,075,830 acres, and the production 2,151,138,580 bushels, valued at $544,985,534, as compared with an area of 72,087,752 acres and a production of 2,122,327,547 bushels reported by the census of 1890 for the preceding year. The average annual yield per acre for the 10 years ending with 1895 was 23.6 bushels, varying from 19.4 bushels in 1894 to 27 bushels in 1889 and 1891. Although corn is cultivated from the Atlantic to the Pacific, and from the Red River of the North to the Everglades of Florida, fully two thirds of each year's crop is the production of some 7 or 8 states in the Mississippi valley, whose several proportions vary from year to year. More than three fourths of the corn-production of the country is consumed in the county where grown, and in many parts of the country there has been a noticeable tendency to restrict the area devoted to this product. The growing favor with which a more diversified system of agriculture is regarded appears, however, to be stimulating the cultivation of corn, especially in the states in which cotton was for so many years almost the only crop. Corn fails to find favor with the countries to which the United States exports its other surplus breadstuffs, and the annual shipments abroad average less than 50,000,000 bushels. In 1894–95 the total exports amounted to only 27,691,137 bushels, valued at $14,650,767, and those of corn-meal to only 223,567 barrels, valued at $648,844.—*Wheat.* For many years wheat-production in this country increased with amazing rapidity. There seemed to be no limit to the capacity of foreign nations to absorb our surplus, at a price which, while subject to fluctuations, was, on the whole, profitable to the producer, and the success that attended the cultivation of wheat in northern Minnesota and Dakota upon the opening of the Red River valley and other similarly favored regions was so marked as to give rise to one of the most remarkable movements of population that have ever occurred, and concurrently to an enormous increase in wheat-production. While the development of the Northwest since 1882 forms, with its attendant circumstances, one of the most interesting chapters in the annals of American agriculture, it can be referred to here only as one of the most

powerful factors in that transfer of the center of the agricultural industry of the country of which mention has already been made. The cheapness of land, the texture and chemical composition of soil, and the long hours of ripening sunshine that prevail in certain sections of the Northwest, are especially favorable to the production of spring wheat on a large scale and at a minimum cost, and this fact, with a considerable increase of production on the Pacific Coast, and a general and serious decline in prices, practically drove some of the older wheat-growing states out of the field of competition; so that while one group of states added nearly eight million acres to the wheat acreage of the country, another group withdrew nearly ten million acres from it. In 1893 the Department of Agriculture made an estimate of the total cost of the production of wheat per acre in the United States, basing its computations upon returns from nearly 30,000 leading farmers, scattered throughout the country. The cost was found to vary from $8.57 in South Dakota to $26.34 in Connecticut, the New England states showing an average for the entire group of $20.22, the Middle states of $18.18, the Southern states of $10.94, the Western states of $10.89, the mountain region of $15.80, the Pacific states of $13.98, and the entire country of $11.69. Estimates based upon returns from 4,000 experts gave as the extremes $7.48 in North Dakota and $28.81 in Massachusetts. The total area under wheat in 1895 was 34,047,332 acres, as compared with a total of 33,579,514 acres at the census of 1890, and the total production 467,102,947 bushels, as compared with 468,373,968 bushels at the census. The average yield per acre in the census year was 13.95 bushels; the average for six years, from 1890 to 1895 inclusive, has been 13.1 bushels. The average for the twenty years, 1870 to 1889, was only 12.2 bushels; and that for the last six years, 1890 to 1895, would have been less than 12.2 bushels but for the phenomenal crop of 1891, which yielded an average of 15.3 bushels per acre. It would therefore appear that the general average for the United States, based upon a sufficiently long series of years, is about 12¼ bushels per acre. The average value per bushel during the last six years has ranged from 49.1 cents in 1894 to 83.9 cents in 1891, with a general average of 64.8 cents. The exports of wheat from the United States vary greatly from one year to another, their volume depending to no small extent upon the crops of the world at large. Between 1879 and 1895 they ranged from 88,600,743 bushels in 1888 to 225,665,812 bushels in 1891. Twice within 16 years they fell below 25 per cent of the total crop, six times they were between 25 and 30 per cent, six times between 30 and 40 per cent and twice between 40 and 42 per cent.—*Oats.* Considering the unimportance of the export trade in oats (the annual exports, including oatmeal, rarely exceeding one per cent of the total crop), there has always been a large production of this cereal in the United States, relatively to population. During the last few years, however, there has been an increase so great as to constitute one of the most remarkable features of the agricultural transition through which the country has been passing. While the total production was 40 years in increasing from 120,000,000 to 400,000,000 bushels per annum, it rose from 400,000,000 to 800,000,000 bushels between 1880 and 1890, largely, it is believed, in the closing years of the decade. This increase, moreover, was not due to any phenomenal yield per acre, but represented a corresponding increase in acreage, and it was not only much larger than that of any other crop, but was also more generally distributed throughout the country. On the whole, the increase has been maintained, the production in 1895 being 824,443,537 bushels, from 27,878,406 acres,—an acreage but slightly less than that in 1889. The average annual yield per acre from 1890 to 1895 was estimated at 25.1 bushels, or slightly less than the average for the period from 1870 to 1889. The decrease was probably due in part to the very low yield in 1890, and in part to the increased cultivation of oats in sections of the country to which this cereal is not so well adapted. Oats, in the form of oatmeal or other prepared foods, enter much more extensively into the dietary of the people of the United States than was formerly the case, and the consumption is rapidly increasing. Their superiority to corn as a food for horses and other work-animals is also now generally recognized, and their use for this purpose has greatly increased within recent years. In this larger use, both for work-animals and as human food, is to be found the explanation of the fact that the increase in the quantity grown is far more than commensurate with the increase in the number of animals. No branch of our export trade is subject to greater fluctuations than oats. Between 1885 and 1895 the exports were less than one million bushels five years out of ten, and yet in other years they ran up to five and one half, nine, and even thirteen and one half million bushels, without any progressive increase or decrease. The same may be said of the exports of oatmeal, but not in so marked a degree.—*Barley.* The history of barley-culture in the United States presents many anomalies. Time was when the state of New York produced more than ten times as much barley as any other state in the Union. Then California suddenly came to the front, and it has maintained the lead for forty years, notwithstanding the vast changes that have been brought about through the settlement of the Northwest, one result of which is that there was nearly three times as much barley produced in 1895 as in 1870, and nearly six times as much as in 1860. While the production of barley has been greatly stimulated by the growth of the brewing industry, it has entirely failed to keep pace therewith, for although barley-production has increased six times as fast as population, the production of malt liquors, so called, has increased twice as fast as the production of barley. The total area devoted to this crop in 1895 was 3,299,973 acres, and the total production 87,072,744 bushels, valued at $29,312,413,—an average yield of 26.4 bushels per acre, the highest ever reported, and an average value of 33.7 cents per bushel, the lowest ever reported. While the tariff imposed on barley in 1890 checked importations, it entirely failed to bring relief to the producer, by increasing the value of the domestic crop, the average price per

bushel declining 25 per cent during the four years the high tariff was in effect.—*Rye and Buckwheat.* Rye has never been extensively cultivated in the United States, and while its production increased during the great influx of population from Germany and other rye-eating countries between 1880 and 1890, there has been a steady decline during the last five years, in accordance with the well-known fact that wheat displaces rye as an article of food with an improved standard of living. The total area devoted to rye in the United States in 1895 was 1,890,345 acres, and the total production 27,210,070 bushels, an average of 14.4 bushels per acre, or about 1½ bushels per acre above the average for 10 years. The value of the crop was $11,964,826, or 44 cents per bushel. After the failure of the rye crops of central Europe in 1891, some twelve million bushels of rye were exported from this country, but ordinarily the exports are insignificant, and in 1894–95 they were even less than the imports. The chief rye-producing section of the United States has not changed to the same extent as have the regions devoted to most other crops; New York, Pennsylvania and Wisconsin having for many years been the states of principal production, though not always in the same order of rank. The cultivation of buckwheat on a commercial scale is almost entirely confined to New York and Pennsylvania, which have produced about two thirds of the total crop throughout the entire period for which we have statistical records. The cultivation of this product is slowly decreasing, the area devoted to it in 1895 (763,277 acres) being the smallest since 1879. The crop, however (15,341,399 bushels), was one of the largest on record, owing to the exceptionally high yield per acre, which was so generally characteristic of the year 1895.

FIBERS.—*Cotton.* Owing to the relative importance of the cotton crop during a period of more than a century, and to the fact that only an inconsequential fraction of the amount produced fails to reach a market in its raw state, we have a more consecutive and authentic history of cotton-culture in the United States than of any other agricultural product. It is, however, impossible to trace that history in detail within the brief space that can here be devoted to it, and the reader will be referred for any additional information he may desire to the publications of the Department of Agriculture and of the Census Office. As early as 1791 the country produced a crop of cotton amounting to 2,000,000 pounds, of which 1,500,000 pounds were grown in South Carolina and 500,000 pounds in Georgia. Ten years later the crop amounted to 40,000,000 pounds; in 1821 it was, in round numbers, 180,000,000 pounds; in 1834, 460,000,000 pounds; and in 1859 (two years before the breaking out of the Civil War), nearly 2,400,000,000 pounds. As has been the case with every other branch of agricultural industry, the center of cotton-production has been gradually moving westward. That westward movement, moreover, has been more rapid than that of any other crop, and has been farther in advance of the center of population. As long ago as 1839 Mississippi produced almost one fourth of the entire crop, or considerably more than any other state. The center of production has not yet crossed the Mississippi River, owing to the new impulse the industry has received in Georgia and the Carolinas, but of the total increase in acreage between 1880 and 1890, 50.38 per cent was west of the Mississippi River, and 14.02 per cent in the states immediately bordering upon it on the east. It took the industry twenty years to recover the ground lost during the Civil War, but within the last decade its progress has been so rapid as to have culminated in the two largest crops on record, one of 9,035,379 bales, or nearly four and one half billion pounds, in 1891–92, and the other of 9,476,435 bales, or upward of five billion pounds, in 1894–95. Of the individual states, Texas is far in the lead in its production of cotton; indeed, in 1894 it produced as much as Georgia and Mississippi (the next two states in order of production) combined, with Arkansas or Louisiana thrown in. Although cotton-production in Texas is confined to about two thirds of the area of the state, the possibilities of extension, even within these limits, are so great that it is more than probable that the proportion of the total crop of the country produced in this state will continue to increase. Not only has the industry reached a density of production in the most favored sections of the older cotton states that can hardly be exceeded (many counties having from 20 to 25 per cent, or even more, of their entire area devoted to cotton), but there is a decided tendency throughout the South to rely less exclusively upon this one crop, and all the indications point, as strongly there as elsewhere, to a more diversified agricultural industry. The average yield of cotton per acre is about .37 of a bale, but it varies widely, not only from one year to another, but also as between one state, and even one section of a state, and another. The average for Louisiana, as a whole, rarely falls below one half-bale to the acre, or 25 to 35 per cent above that of the cotton states generally. This is due, in large measure, to the extraordinary productiveness of a chain of seven parishes lying along the west bank of the Mississippi River, which have averages of from seven tenths to nine tenths of a bale per acre. The river counties of Mississippi likewise show high averages. On the other hand, it is no uncommon thing for a state not to have more than one or two of its counties yielding as much as four tenths of a bale to the acre. In some of the older states, notably in South Carolina, an improved cultivation and an increased use of fertilizers have within the last few years considerably increased the average yield per acre, and, as a consequence, the total production of the state. There has never been a time when the principal proportion of the annual cotton crop of the United States has not been exported. Prior to 1845 it was rarely that that proportion was less than 80 per cent, and the same high figure was reached in the year preceding the breaking out of the Civil War. Since the resumption of exports the proportion has averaged a little under 70 per cent, and so remarkably uniform has it been that, except in the year 1869, it has not, during a period of 30 years, either fallen below 64.7 per cent, or risen above 72.4 per cent.—*Flax.*—Flax is one of the 'curiosities of

American agriculture. It was formerly grown somewhat extensively for the fiber; within the last 10 years it has been raised almost exclusively for the seed. In 1869, 1,568 pounds of fiber were produced to every 100 bushels of seed; in 1889, 4,246 bushels of seed were produced to every 100 pounds of fiber. The almost entire discontinuance of the production of fiber is due to the practical abandonment of the household manufacture of linen, now known to exist only in one of the extreme western counties of Virginia, which until recently was destitute of railroads, and to the fact that there has been no considerable demand for flax for factory purposes to take the place of this expiring industry. The remarkable increase in the production of seed has been in connection with the opening up of new farms in the Northwest; Minnesota, Iowa, South Dakota and Nebraska producing, at the last census, over 80 per cent of the 10,250,410 bushels grown in the United States. Of the 241,389 pounds of fiber reported at the last census, the greater part was entirely unfit for spinning, being only a very common quality of tow, of no use except for upholstering purposes. For some years past the Department of Agriculture has periodically called attention to the fact that the American people, among the largest consumers of linen in the world, might be entirely independent of the foreign manufacturer; scutched flax, capable of holding its own against all but the finest imported varieties, having been produced in this country. The linen industry, however, increases but slowly, and there is but little inducement to produce a high grade of fiber. The total value of all flax products at the last census was $10,436,228.—*Hemp.* The production of hemp in the United States is confined almost exclusively to the state of Kentucky, which contributed, at the last census, 10,794 tons of fiber out of a total production of 11,511 tons, its proportion being thus 93.77 per cent. The total number of hemp-growers was 1,374; the total area devoted to the industry, 25,054 acres (an average of 18.23 acres to each producer); the average yield per acre, 1,029 pounds; and the total value of the crop, $1,102,602,—being $44.01 per acre, $95.79 per ton, and $802.48 to each producer. The production of hemp in the United States falls considerably below the requirements of the country; and considering that it is a product that is successfully cultivated both in northern and southern Europe, and likewise in Asia, Africa and South America, this geographical restriction in its cultivation in the United States is somewhat surprising.

Tobacco. There are not more than half a dozen states and territories that do not make some contribution to the tobacco crop of the country; nevertheless, considerably over one half of the total is grown in Kentucky and North Carolina. This product, as already stated, was one of the first to be exported, and it has long constituted one of the most important branches of the agricultural industry in certain extensive sections of the country. Still, it is not one that has increased, even in proportion to the increase in population; the total production in 1859 having been 434,209,461 pounds, as against 488,256,646 pounds in 1889, and 491,544,000 pounds in 1895; the population of the country within this period of 36 years having considerably more than doubled. The average production per acre for the entire country is about 750 pounds, varying, however, somewhat widely between the seed-leaf states and the states in which the manufacturing and export varieties predominate. The changes that have been at work in American agriculture during the last half-dozen years have not failed to affect (and are probably still affecting) the business of tobacco-growing, and the foregoing general observations will be less liable to be misleading than would be details concerning individual states for particular years. Where desired for statistical comparison, the latter can be procured from the Department of Agriculture, which makes up annual reports concerning all the principal crops. The exports of leaf-tobacco do not vary from year to year, as do most other products, and the total exports of manufactured and unmanufactured constitute not far from three fourths of the total production.

Forage Crops. The area devoted to grass and other forage plants has fluctuated during the last 10 years in a most remarkable manner. Concurrently with the great shrinkage in the wheat acreage, there was a more than equivalent increase in the area devoted to grass, which increased from 30,631,054 acres in 1879, to 52,948,797 acres in 1889, with a more than proportionate increase in production from 35,150,711 tons to 66,831,480 tons. This increase, while widely distributed, was principally in the states where the live-stock and dairying industries showed the largest development, but there is reason to believe that it was to some extent merely an incident in the period of change and unsettlement through which American agriculture in general has been passing, since from returns made to the Department of Agriculture there has been a decrease of several million acres in the area devoted to hay during the last three years. The average yield per acre of hay and other forage crops at the last census was 1.26 tons, the highest averages being those of states in which irrigation is practiced, and where alfalfa, of which several crops are cut each season, is the principal forage plant. In 1895 the average for the entire country was 1.06 tons to the acre, and the value of the crop reported was only $393,185,615,—a great falling off as compared with preceding years. Within the arid region the cereals are not infrequently cut for hay. In California this practice has become quite common; but, taking the arid region as a whole, that most nutritious, prolific and drought-withstanding forage plant, alfalfa, or lucerne, is in greatest favor.

Truck-Farms. Truck-farming is distinct from market-gardening; the former being carried on in favored localties, at a distance from the center of distribution, while the latter is the growing of vegetables in the immediate neighborhood of towns and cities. Truck-farming has attained considerable proportions within a very short time. A special investigation of the industry, made in connection with the last census, disclosed the fact that upward of one hundred million dollars were invested in it at that time, the products having a value of $76,517,155 to the producers, in one year, after paying freights

and commissions. There were devoted to the industry 534,440 acres of land, and it gave employment to more than 240,000 persons. Since the publication of these figures the business has continued to grow with astonishing rapidity, and it is doubtful whether any other single industry is now bringing as much money into the South as is this one. The finest trucking country in the world is found on the Atlantic coast, from Virginia to Florida. The season appears to advance along the coast at an average rate of 15 miles a day, there being therefore an earlier ripening by about one week for every hundred miles of distance southward. In this way the populous centers of the North are supplied with early fruits and vegetables in continuous succession, from their first ripening in Florida to the placing upon the market of the products of their own local market-gardens. Gross sales amounting to as much as two thousand dollars from one acre of land during 12 months have been made, and as much as one million dollars' worth of truck has been shipped from a single point in one season. One result of this industry has been a great advance in the value of land. Many farms that, but a few years ago were almost worthless are now valued at from forty to two hundred dollars per acre, according to location and convenience to market.

MARKET-GARDENS. There is less definite information available concerning such products of American agriculture as come under this head, than of any other branch of farming. This arises in part from the smallness of the individual patches of ground upon which, collectively, an immense amount of produce is grown, and in part from the fact that no inconsiderable proportion is sold by the producer to the consumer without transportation or the intervention of middlemen. Neither the Census Office nor the Department of Agriculture has attempted to get returns respecting any of the common vegetables, except Irish and sweet potatoes, but as to these products the statistics are fairly complete. The last census reported 2,600,750 acres under Irish potatoes, with a production of 217,546,362 bushels, and of 524,588 acres under sweet potatoes, with a production of 43,950,261 bushels. Since that time there has been an increase of over 350,000 acres in the area devoted to Irish potatoes, and the high average yield per acre that accompanied this increased acreage in 1895 resulted in the unprecedentedly large crop of 297,237,370 bushels, which was, however, worth many millions of dollars less than some preceding crops of half its size. In this, as in almost every other branch of agriculture, the rank of the various states is constantly changing. Not more than from five to ten per cent of the crop is, however, grown in the Southern states, while of sweet potatoes not more than from ten to fifteen per cent of the crop is raised in the North.

SUGAR. The total area devoted to the cultivation of sugar-cane, not including sorghum, in 1889 was 274,975 acres; the total production of cane sugar 301,284,395 pounds, and the total production of merchantable cane molasses, 25,409,228 gallons. Of this production, 292,124,050 pounds of sugar and 14,341,081 gallons of molasses were contributed by Louisiana. During the same year 80,777 tons of sorghum-cane were sold for sugar-making (almost wholly in Kansas), and 24,235,219 gallons of sorghum molasses were made, chiefly in the Southern states, and those of the Mississippi, Missouri and Ohio valleys. There were also made in the same year 32,952,927 pounds of maple sugar and 2,258,376 gallons of maple syrup, more than three fourths of the maple sugar being made in Vermont and New York, and more than one half of the maple syrup in Ohio and New York. In 1894–95 the total production of cane sugar was no less than 729,392,561 pounds, of which 710,827,438 pounds were produced in Louisiana, and that of cane molasses 37,617,074 gallons, of which 28,334,513 gallons were the product of Louisiana. The production of beet sugar is ascertainable only through the amount on which bounty was paid, which was 45,191,296 pounds in 1894.

ORCHARD PRODUCTS. Like those of market-gardens, the products of orchards are difficult to ascertain in their entirety, in consequence of the large production on fractions of acres. The figures available, however, help us to realize the magnitude of American horticulture, even though there are extensive sections of the country in which fruit-culture is only just beginning to make its way. The last census reported a production of 143,105,689 bushels of apples, a fruit that was raised to a considerable extent in all sections, except in Florida, in the Northwest and in the arid states and territories; 36,367,747 bushels of peaches, raised chiefly in the section of country extending from New York to Florida, and westward to the Mississippi River in its northern and to Texas in its southern portion, and reappearing in California, where its product has a great reputation; 3,064,375 bushels of pears, the production of which was, in the main, well distributed; 2,554,392 bushels of plums and prunes, nearly one half of which were grown in California; 1,476,719 bushels of cherries, the production of which was likewise fairly well apportioned, except in the arid region and the far Northwest; and 1,001,482 bushels of apricots, of which 970,941 bushels were grown in California. These figures must be taken understandingly, for while the census year is known to have been a poor fruit year, there are no other figures with which the foregoing can be compared, and consequently there is no means of determining how far there was a departure from normal conditions in the different sections of the country. That the failure did not affect all sections alike, however, is well known, for in that memorable year hundreds of car-loads of apples grown on what were but recently treeless plains of Nebraska were shipped both to New York and to San Francisco. There are no figures available as to the production of small fruits, but it is known that the crop is an enormous one and is gradually increasing. When many of the present residents of Nebraska and other transmissouri states first settled in those regions few believed that fruit of any kind could ever be successfully grown there. Now, however, successful orchards and fruit-gardens are found far in the interior of Kansas and Nebraska. In some counties apple trees are to be found on nearly every

farm, and the importation of any variety of fruit, except such as are tropic or sub-tropic, will soon be a thing of the past. The growing of these last-mentioned products is necessarily restricted within narrow limits; so narrow, indeed, that it hardly seems possible that the crop of a single year, including nuts, could have been worth $14,116,227, as was that of 1889. Of this amount the orange represented $6,602,099, the pecan $1,616,577, the almond $1,525,110, the Madeira nut $1,256,958, the lemon $988,100, the pineapple $812,159, the olive $386,368, the fig $307,272, the banana $280,654, and the cocoanut $251,217.

VINEYARDS. In 1889, 267,271 tons of grapes were sold for table use, 240,450 tons for wine-making, 41,166 tons were made into raisins, and 23,252 tons were used for other purposes,—a total of 1,144,278,000 pounds. The grape, raisin and wine industries of the United States represent a total invested capital of upward of $155,000,000, and furnish employment to over 200,000 persons. To California have to be credited one half of the employees, more than one half of the invested capital, three fifths of the wine-production and the total production of raisins. The figures for New York, the state which stands next in rank, are comparatively small, except as to grapes sold for table use, which exceed 60,000 tons annually, or over 50 per cent more than any other state. While in California the grapes are mainly European varieties, in almost every other part of the country they are improved varieties of native origin. Phylloxera, the scourge of European vineyards, has found its way into California and has done considerable injury. It forms the only serious menace to an industry that gives promise of becoming one of the most important in the country, in addition to effecting a most desirable reform, in the substitution of a pure, wholesome domestic wine for the sophisticated wines of foreign countries, for ardent spirits, and for malt liquors that contain no malt.

MINOR CROPS. There are a number of products that do not fill any large place in the grand total of American agriculture, but which are, nevertheless, matters of no little importance within the geographical limits to which they are confined. Thus there were reported at the last census 128,590,934 pounds of rice, valued at $3,897,334, and grown on 161,312 acres, chiefly in Louisiana, South Carolina and Georgia; 39,171,270 pounds of hops, valued at $4,059,697, on 50,212 acres, of which 36,670 acres were in New York and 12,217 acres on the Pacific Coast; 9,378,903 bushels of pulse, grown in considerable proportions in every large section of country except New England, the Northwest and the north Pacific Coast; 38,557,429 pounds of broom-corn, grown on 93,425 acres of land, chiefly in the north central states, and particularly in Illinois and Kansas; 3,588,143 bushels of peanuts, valued at over $3,000,000, and representing an area of 203,946 acres, nearly one third having to be credited to Virginia and another third to Georgia and Tennessee; 1,793,369 tons of cotton-seed, valued at $15,852,525, sold by planters, mainly to oil-mills, and 5,700,239 bushels of grass and clover seed, upward of 5,000,000 bushels of which were raised in the north central states. The same year florists sold plants to the value of $12,036,478, and cut-flowers to the value of $14,175,328. The products of nurseries are not reported, but the capital invested in the nursery business aggregates the large total of $52,425,670.

II. LIVE-STOCK.—*Ranges.* Stock-raising has long constituted one of the most important interests in the United States. No only have the American farms contained, in the main, larger numbers of domestic animals than those of almost any other country, but throughout that extensive region formerly included in Spanish America grazing has been a special occupation, under what is known as the ranch or range system. Under this system vast herds of cattle roamed at will over the public domain, their natural increase being distributed among their different owners at an annual "round-up." The gradual settling up of the country, however, under the operation of the United States land laws, has slowly but surely pushed the range industry farther and farther westward, until it has almost crowded it out of existence. While perhaps there is as much stock in the old range country as ever there was, it is now made up mainly of small herds, grazing upon the lands of their owners. It is no rash venture into the field of speculation to affirm that it is the natural destiny of the range system to be completely swept out of existence by the advancing tide of permanent settlement.—*Horses.* The estimated number of horses on farms and ranches on Jan. 1, 1896, was 15,124,057, valued at $500,140,186,—an average of $33.07 per head. The largest numbers were in Texas, Iowa and Illinois, each of which had between 1,100,000 and 1,200,000. Although the total number corresponds very closely with that reported at the last census, it must not be supposed that the industry has been stationary. In 1893 the number reported was nearly one million greater than in 1896, and so great has been the decline in values that in 1892 the horses reported, while not greatly in excess of the present number, were worth double the present value, or over one billion dollars. This great decline is admittedly due to the rapid extension of electric and cable car systems, and to the increased use of bicycles. So cheap are sound young horses in certain parts of the country that their exportation to countries in which horse-flesh is used for food has been proposed. It is worthy of note that from 1860 to 1890 the increase in the number of horses was far more than proportionate to the increase in population.—*Mules.* The number of mules on Jan. 1, 1896 (2,278,946), has never been greatly exceeded. It is, however, a slightly smaller number than in any year since 1889, and the value of these animals, like that of horses, is gradually declining, the total being $103,204,457,—an average of $45.29 per head. Mules are used on farms most extensively in Texas, Missouri and the cotton states east of the Mississippi River. They are almost unknown as farm-animals in the New England states, and their numbers are small throughout the arid region. —*Working-Oxen.* The use of oxen as work-animals

declined gradually from 117 to every 100 farms in 1850, to 24 for every 100 farms in 1880. Since that time the proportion has changed but slightly. While there has been some increase in the number, it has only kept pace with the increase in the number of farms. It is chiefly in the South that the ox finds favor as a work-animal, but the New England states contain about ten per cent of the total number.— *Milch Cows.* Under normal conditions the proportion of milch cows to population varies less than that of any other domestic animal or any important product of the soil. In five decennial censuses the number per 100 of the population varied only from 23.2 in 1870 to 27.5 in 1890, the proportion in 1890 being 26.4. Since that time there has been a slight decrease in the total, notwithstanding that the continued development of the dairy and creamery business has led to an increase in some of the most important states. The total value of milch cows on Jan. 1, 1896, was $363,955,545,—an average of $22.55 per head. New York, Iowa and Illinois have the largest number, each having upward of one million head. It is a noteworthy fact that while New York, Pennsylvania and all the New England states had fewer farms and a smaller acreage in farms in 1890 than in 1880, every one of them showed an increase in the number of milch cows. The most remarkable increase within recent years has taken place in the states of the northern Mississippi valley, the chief center of that enormous development of the dairy and creamery industry to which reference will be made elsewhere. In Iowa, for example, the last census found no fewer than 32 counties in which there were more than 1,000 milch cows for every 1,000 of population, Delaware County standing at the head of these and all other counties in the United States, with the high average of 1,630 to 1,000. A gratifying feature of the statistics of milch cows is the increase that has taken place in almost every section of the South. There is no country in the world in which the rival claims to superiority of the different breeds of cattle have been more pertinaciously fought out than in the United States. At the Columbian Exposition at Chicago in 1893, a trial was instituted that was expected to settle the controversy for many years to come. The result of the competition was declared to be in favor of the Jerseys, but beyond this simple announcement no official report has been made. Whatever the reason for its non-appearance, it certainly is not creditable to those responsible for it.— *Other Cattle.* There were reported to the Department of Agriculture on Jan. 1, 1896, 32,085,409 oxen and other cattle, as against 1,117,494 working-oxen and 33,734,128 other cattle reported by the census in 1890,—a decrease of nearly three million head, chiefly in the north central states. But notwithstanding this large decrease the cattle reported under this head in January, 1896, represented the large sum of $508,928,416. The largest number of neat cattle of all classes to every square mile of land surface at the last census was found in Iowa, where the average was 88.25. East of the Mississippi River, it is only in the states of Vermont and Florida that there are 1,000 or more neat cattle on farms for every 1,000 of the population. West of the Mississippi River, however, the proportions are almost entirely reversed, there being few states or territories west of that dividing line the number of whose neat cattle on farms is not largely in excess of population. In Wyoming there are 11 neat cattle on farms to each inhabitant, while the addition of those on the ranges in that state would increase the ratio to more than 15 to 1.— *Quality.* Of the 51,363,572 neat cattle on farms in 1890, 506,060, or .99 per cent, were pure bred; 8,257,989, or 16.08 per cent, were grades, one half blood, or higher; and 42,599,523, or 82.93 per cent, were common or native, including grades of less than one-half blood. The largest proportion of pure-bred cattle was found in the north Atlantic states, but the percentage of pure-bred and grades combined was greatest in the north central states. There were 13,015,775 neat cattle sold, living or slaughtered, from off farms in 1889, the proportions in the North being double those in the South. The highest percentage was in New Jersey. There were slaughtered for consumption on farms 1,294,237, the proportions varying in the different states from 1 to 5 per cent. The total number that died from disease and stress of weather (not including the large but unascertained percentage on ranges) was 2,028,070. In the main, the mortality was highest where the percentage of improved stock was lowest, and lowest where this was highest; the explanation being found chiefly in the difference in the degree of care bestowed upon the animals. The mortality in Florida exceeded that of many of the northwestern states, with their rigorous climate.— *Contagious Diseases of Cattle.* Although that terrible scourge of the Eastern world, known as rinderpest, has never visited the American continent, the United States has sustained heavy losses in the past, through visitations of pleuro-pneumonia, foot-and-mouth disease and Texas fever. The country has, however, been entirely free from pleuro-pneumonia since 1892, and from foot-and-mouth disease since 1884. Not less than one fourth of the total area of the country is permanently infected with Texas fever, but the mortality within the infected district is not large, the losses occurring chiefly through the introduction of infected cattle into healthy districts. —*Swine.* The number of swine has fluctuated to an extraordinary degree during the last 10 years, and the number reported on Jan. 1, 1896 (42,842,759), is the smallest since 1881, as is also the value of the same. The more recent decrease is ascribed in part to cholera and other diseases, and in part also to the failure of the corn crop of 1894. This fact furnishes another illustration of how misleading is the practice so frequently indulged in of using the figures for the last or some other single year as a fair measure of the extent and importance of a given industry. In the main, the raising of swine is of most importance in the states that produce the largest corn crops. In Iowa, for example, there were 4,324 swine for every 1,000 of the population at the last census. No inconsiderable proportion of what may be described as the annual hog crop is consumed on the farms, the number slaughtered for

such consumption in 1889 reaching a total of 15,426,329,—equivalent to nearly 27 per cent of the total number on hand on June 1, 1890. In Virginia the proportion was over 71 per cent, while in the states in which swine are raised for shipment to the great stock-markets of the country the proportion was only from 7 to 10 per cent. Nearly ten million hogs died of disease in 1889. The largest number of deaths was reported from the states in which the industry has attained the largest dimensions, but the highest percentages of mortality were reported from the South.—*Sheep and Wool.* There has been some decrease in the number of sheep in the United States during the last two or three years, but not nearly so great a one as is commonly supposed. The estimated number of sheep on Jan. 1, 1896, was 38,298,783, as compared with a total of 40,876,312 enumerated by the census on June 1, 1890. While there has unquestionably been a large decrease in the Eastern and middle states, there has been a very considerable increase in Montana, Wyoming, Colorado, New Mexico, Arizona, Nevada, Idaho, Washington and Oregon, the region to which the sheep industry of the country has been steadily gravitating for some years. Of the 35,935,364 sheep on farms in 1890, 16,725,415, or 46.54 per cent, were reported as merino, "fine" wool (one half to full blood), and 7,435,471, or 20.69 per cent, as English breeds, "long" or medium wool (one half to full blood), leaving 11,774,478, or 32.77 per cent, enumerated under the category "all other." Massachusetts was the only state having a majority of its sheep mainly of English blood. Vermont had the highest percentage (91.01) of full-blooded and graded sheep. The percentage of lambs sold is highest in states convenient to the chief centers of population, New Jersey standing at the head, with 78.42 per cent. In Texas, on the other hand, only one out of seventeen was sold for consumption, while in Arizona there was practically no sale of lambs for market. In the great sheep-growing states of the West large numbers of sheep are slaughtered for consumption on the farm, but in the East the number is insignificant. No fewer than 610,329 sheep were killed by dogs in 1889, chiefly in the Southern states. Arkansas lost 11 per cent of its total number from this cause. Even in Connecticut and Massachusetts the losses were 3.99 and 5.57 per cent, respectively. On the other hand, the loss in North Dakota was less than one-half of one per cent, while in Montana only 22 sheep out of every 10,000 were killed by dogs. The farmers have the remedy in their own hands, and where, as in Montana, the sheep industry is one of great importance, effectual means are taken for the protection of the flocks. Nearly two and one half million sheep died from disease and stress of weather in 1889, the rate of mortality in the New England states being about twice as great as in Minnesota, North Dakota and Montana. The wool product of 1895 is estimated at 309,748,000 pounds, as compared with 298,057,384 pounds in 1894. The wool crop in this country is very difficult either to estimate, or to ascertain by enumeration. The census occurs before the spring-shearing is completed, fall-shearing is practiced within certain sections of the country not clearly defined, and varying from time to time, and the average weight of fleece is subject to too great a variation to be easily estimated.—*Dairy Products.* The development of the dairy and creamery industries during the last 10 years has certainly constituted one of the most notable features of American agriculture. Notwithstanding the great extension of the creamery system and the decline of our export trade, the production of butter on farms has increased even more rapidly than population, the production averaging 16.33 pounds *per capita* of the population in 1889, as compared with 15.5 pounds in 1879 and 13.33 pounds in 1869. While Vermont retains its reputation as a great dairy state, producing over 80 pounds of butter to every man, woman and child within its borders, it is to the northern Mississippi valley that we look for the principal butter-production of the country. In that section the old dairy and the new creamery systems have flourished side by side, until now more than one half of the total butter-production of the country has to be credited to seven states. The total amount of butter made in 1889 was 1,205,508,384 pounds, as compared with 806,672,071 pounds in 1879. The increase in the production of butter is not due alone to the increase in the number of cows, but in no small degree to improved methods of farming. This is shown in the increased production of butter per milch cow, from 64.83 pounds in 1879 to 72.98 pounds in 1889. This increase, moreover, is not confined to those sections of the country in which the creamery industry has been established, many Southern states that contain no creameries whatever showing a remarkable increase in butter-production per milch cow.—*Cheese.* While nearly six times as much butter is made on farms as in creameries, nearly thirteen times as much cheese is made in factories as on farms. But, notwithstanding the large increase in the factory system which this implies, the total production of cheese in the United States, *per capita* was not only less in 1889 than in 1879, but even less than in 1849. In Wisconsin the total production averaged 33.7 pounds for each inhabitant, but for the entire country the average *per capita* was only 4.10 pounds, of which less than five ounces represented the production on farms. Our exports of cheese have shown a steady decline for some years, and there being no increase in the domestic consumption, production has fallen off relatively to population. The shrinkage of exports is alleged, not only by foreign importers, but by United States consuls abroad, to be due to the shipment of what is known commercially as "filled cheese," made from skim-milk, to which lard and other fats have been added. It is to be hoped that recent legislation will check this great evil, it being now imperative that filled cheese shall be sold only from original and plainly marked packages. There are no figures with which to compare the milk-production reported at the last census, but the total was 5,210,125,567 gallons,—an average of 83 gallons for each inhabitant, or 315 gallons per milch cow. The highest average milk-production was reported from the states having the highest percentage of pure-bred

cattle. Vermont and Iowa had a production of over 200 gallons for each inhabitant; in New Mexico it was less than 5 gallons *per capita*, and even in Louisiana it was under 12, and in Florida under 13 gallons, for each inhabitant.—*Poultry and Eggs.* The poultry and egg production of the country is so difficult to ascertain that no attempt is made to collect statistics relating to it, except in connection with the decennial census. The industry appears to have been the subject of a remarkable development between 1880 and 1890, the number of barnyard fowl having increased within that period from 102,272,135 to 258,871,125, other poultry from 23,235,187 to 26,738,315, and the total egg-production from 456,910,916 dozen to 819,722,916 dozen. Of the "other poultry," 10,754,060 were turkeys, 8,440,175 geese, and 7,544,080 ducks. There is a surprisingly small production of eggs (less than five per cent of the whole) in the New England states, and considerably less than one per cent in the arid region, even including Colorado. Ohio has the largest production of any single state, followed by Iowa, Illinois, Missouri and Pennsylvania, each of which produces over fifty million dozen.—*Apiarian Products.* The total production of honey at the last census was 63,897,327 pounds, and of wax 1,166,588 pounds. Iowa led in the production of honey, followed by Illinois, Missouri and New York. In the production of merchantable wax North Carolina is far in the lead.

III. Irrigation. The artificial application of water to promote the growth of crops is almost as ancient as agriculture itself,—agriculture, like the human race, having had its beginnings in the arid regions of the world. The irrigation-works of Egypt, Assyria, Babylonia and China antedate the historic period, and are known from their remains to have been on a colossal scale. At a later period came those of the Roman empire, and still later those of Spain and Spanish America, the ruins of which still testify to their vast extent and substantial character. The most notable irrigation-works of our own time are those of British India, where many of the canals are of such dimensions as to be regularly used for purposes of navigation. Most of them have been built by the Indian government to prevent the recurrence of those disastrous famines by which certain of the more arid but yet densely populated sections of the country have so often been visited in the past. The benefits accruing from irrigation are not confined to the absorption of moisture by the plant itself. The soil is rendered more easily cultivable, and also more readily penetrable by the roots of the plants, and not only are the stores of plant-food contained in the soil rendered more available, but the water itself is not infrequently more or less heavily charged with the elements of plant-nutrition. The practice of irrigation in the extreme western parts of the United States may be said to have been inherited from our Spanish predecessors. Unlike other forms of development, its movement has been from west to east, until now it is resorted to, not merely in the regions where it is absolutely indispensable to the successful prosecution of agriculture, but also in that sub-humid border-land where the rainfall is too uncertain for dry farming to be practiced with any assurance of success, and to a limited extent within the humid region itself for crops whose highest development depends, not so much upon the amount of moisture they receive as upon the time and manner of its distribution. The total number of acres reported by the census of 1890 as irrigated the preceding year was 3,631,381, of which 1,004,223 acres were in California, 890,735 acres in Colorado, and 66,965 acres in the sub-humid region, the remaining 1,668,458 acres being distributed through other sections of the arid region. The number of farms on which irrigation was practiced was 54,136, of which 13,732, or more than one fourth, were in California. The average size of such portions of farms as were actually irrigated was 67 acres, ranging from 27 acres in Utah to 192 acres in Nevada. In Utah and Nevada over 90 per cent of the total number of farms were reported as irrigated; in New Mexico, Montana, Idaho and Wyoming, between 60 and 70 per cent; and in California (taking the entire state as a unit, as in the preceding cases), not quite 26 per cent. The total estimated value of the 3,564,416 acres irrigated in the arid region was $296,850,000,—an average of $83.28 per acre. The irrigated farms of California, with an average value of $150 per acre, represent more than one half of this total, the remaining averages ranging from $31.40 per acre in Wyoming to $84.25 per acre in Utah. The total estimated value of the products of these irrigated lands for the year preceding the census was $53,057,000, or $14.89 per acre irrigated. Here, again, California is in the lead, with products valued at $19,080,000,—an average of $19 for each acre irrigated. Utah has an average of $18.03 per acre, while Wyoming, whose crops consisted largely of forage, had an average of only $8.25 per acre. The first cost, including land, water rights, fences, and preparation for cultivation, of the irrigated areas, reported as worth $296,850,000, was declared by the farmers themselves to have been only $77,490,000, the increase in value amounting, therefore, to $219,360,000, or 283.08 per cent. The irrigation systems themselves were reported as having a value of $94,412,000,—an increase of $64,801,000, or 218.84 per cent upon their cost. The average value of water rights (which represent the right or privilege of using water for irrigating purposes, either in a definite quantity or upon a prescribed area of land) varies, in the different states, from $8.69 per acre in Wyoming to $39.28 per acre in California, the average for the entire arid region being $26 per acre. There are fruit-growing districts in California where water rights have been sold at as high as $1,500 per miner's inch, or from $100 to $500 per acre, according to the quantity used on any given area of land. The duty of water, or the number of acres a given quantity of water is required to irrigate under ordinary circumstances, is usually from 100 to 200 acres per second-foot. It has, however, been known to be as low as 50 acres where water is abundant, and as high as 500 acres where it is very scarce. There is great lack of uniformity in the methods by which water used for irrigation purposes is measured. In the two leading irrigation states of

California and Colorado the miner's inch is chiefly used; but even this varies, 100 Colorado inches covering an acre of land to a depth of 5.2 feet in 24 hours, while the same number of California inches would cover a like area only to a depth of 4 feet in the same time. An acre-foot, or the quantity required to cover an acre of ground to a depth of one foot, has the merit of definiteness, but its practical use is very limited. The quantity of water it represents is 43,560 cubic feet, or 325,851.4512 gallons, weighing 1,213 tons 2,113 pounds, at 2,240 pounds to the ton. The unit of measurement that is really the most satisfactory, by reason of its definiteness, its relation to flowing water, and its applicability, either to large or relatively small quantities, is the second-foot, which is rapidly superseding the miner's inch. It is the quantity represented by a stream 1 foot wide and 1 foot deep flowing at the average rate of 1 foot per second. It is, accordingly, 1 cubic foot per second, 60 cubic feet per minute, 3,600 cubic feet per hour, and 86,400 cubic feet, or 646,316.928 gallons, per day of 24 hours. This last-mentioned quantity would cover 1 119-121, or say 2, acres to a depth of 1 foot. The second-foot is used by the United States government in the gauging of rivers and streams, and that its use in the measurement of water for irrigation will speedily become general admits of no doubt. Of the 8,097 artesian wells on farms, averaging 210.41 feet in depth, $245.58 in cost, and 54.43 gallons per minute in discharge, 3,930 were used for irrigating purposes, the total area thus irrigated being 51,896 acres, or an average of 13.21 acres per well. Of these, 2,060 were in California, 1,224 in Utah, and 345 in Colorado, leaving only 301 for the remainder of the arid region.

Relations of the Government and its Agricultural Stations to the Farmer. What the farmer cannot individually or by co-operation do for himself, the government may properly do for him. It therefore systematically observes, records, and, as far as may be, forecasts the weather; it ascertains, from time to time, the total production and disposition of the principal crops of the country, and the number and general condition of the different farm-animals; it maintains experts to investigate the nature of soils, the adaptability of plants to different environments, the diseases of the animal and vegetable kingdoms, and the ravages of destructive birds and insects. All these investigations, with others of a subordinate character, but directed to a similar end, are systematically and continuously carried on by the United States government at Washington and elsewhere, and some of them also by the different state agricultural experiment stations subsidized by Congress. The results of these investigations, and of the work of the best scientists and experimentalists everywhere, are from time to time placed within the reach of the farmer, either free or at a merely nominal cost. So long, moreover, as the products of American agriculture continue to be so greatly in excess of the requirements of our own population, and their prices to be so largely governed by prices abroad, as has been the case throughout almost the entire history of the country, it is proper that the government should keep itself informed as to the condition of foreign markets and the nature and origin of the food-supplies of the world, to the end that new or improved outlets may be found for the surplus products of the country. It may also strive to effect the removal of irksome restrictions imposed by foreign governments upon the importation of particular products. Here, however, its proper function in this regard comes to an end, and individual effort must once more be relied upon. The government cannot compel a purchaser to accept an inferior article or to pay a higher price than is fixed by the law of supply and demand, and it certainly is not its duty to make up to the producer for the deficiencies of an unprofitable market.

Present Trend of American Agriculture. Reference has been made in the foregoing pages to the fact that American agriculture has during the last few years been passing through a period of transition, or of readjustment to new conditions, due to the increasingly rapid westward movement of the agricultural center of gravity and to the unprecedentedly low prices of the two principal money crops, wheat and cotton, for the surplus portions of which the American farmer and planter has been accustomed to receive from his foreign customers from $300,000,000 to $500,000,000 per annum. For the first time in its history, American agriculture is suffering somewhat seriously from the competition of other countries in the great markets of the world. That competition is not a mere accident of the moment: it is a phase of the struggle for existence between nations; and so long as American farms are annually producing from $500,000,000 to $800,000,000 worth of products over and above what the American people themselves can consume, it will have to be reckoned with. The purpose for which this article is written is such that its statements must be as true and have as practical an application 10 years hence as to-day. It is in the full appreciation of this fact that the writer pronounces the secret of the future prosperity of American agriculture to lie chiefly in its adaptations to the world's needs. The ready adaptability of the American to new conditions is proverbial all the world over, and in nothing is it more conspicuous than in agriculture. When the farmers of New England found themselves unable to compete with the Northwest in what had been their principal agricultural products for five generations, they did not throw up their hands in despair, but sought out and applied themselves to what they could do best, with the result that they got larger returns on their capital and labor than ever before. Notwithstanding the unprecedentedly low prices of all kinds of farm produce, the farmers of Rhode Island increased the value of their products between 1879 and 1889 from $12.29 to $15.37 per acre, and the farmers of Massachusetts increased theirs from $11.35 to $16.94 per acre. If American farmers and exporters will study and cater to the tastes and requirements of their foreign customers, they need not fear being left in the race. A notable characteristic of the present time, and one that is scarcely likely to become an evil, is the

tendency to a greater diversification of the products of the individual farm. This tendency is just as marked in the states that a few years ago were growing nothing but cotton as in those which were almost exclusively devoted to wheat. It is in strict accord with both the soundest principles and the most successful practice, and is a gratifying and encouraging sign of the times. J. STERLING MORTON,
*Ex-Secretary of Agriculture.*

AGRICULTURE, DEPARTMENT OF. The commissionership of agriculture, established in 1862 by Congress, was raised to the rank of a government department in 1889, and its chief (a secretary) constituted a Cabinet officer, drawing the same salary as other heads of departments, but ineligible in the succession to the Presidency, because his department was created after the passage of the Succession Act by the Forty-ninth Congress. The department embraces the weather bureau, bureaus of forestry, agricultural chemistry, botany, entomology, pomology, animal and vegetable pathology, and of experiment stations. It also maintains an herbarium, and propagating-gardens for testing the value of plants. Monthly reports are compiled for gratuitous distribution throughout the country. Particularly valuable are the reports on and estimates of the staple crops, with description of their insect enemies and the best measures to restrict their ravages. It also distributes seeds throughout the agricultural community, chiefly on recommendations made by members of Congress. The department occupies a commodious building in the park, near the Smithsonian Institution, in Washington. The names of the Secretaries of Agriculture are Norman J. Colman, of Missouri (1889); Jeremiah M. Rusk, of Wisconsin (1889–93); J. Sterling Morton, of Nebraska (1893); and James Wilson, of Iowa (1897).

AGRIMONIA, a genus of plants of the family *Rosaceæ*. The common agrimony (*Agrimonia Eupatoria*) is a native of Europe, and is also found in the United States. It attains a height of two feet or more, and has interruptedly pinnate leaves and toothed leaflets. The flowers are small and yellow, and the prickly fruiting calyx detaches at maturity as a small bur, adhering by its hooked bristles to passing animals. The plant has a pleasant and slightly aromatic smell, and is bitter and styptic. A decoction of it is used as a gargle, the dried leaves for making herb-tea, and the root as a vermifuge.

AGROSTIS, a large genus of grasses, widely distributed throughout the world, and especially valuable for pasturage. In America the well-known *A. vulgaris* is extensively cultivated, and is known as "red-top." The genus has given the name *agrostology* to that part of botany which relates to grasses.

AGUE. See FEVER, Vol. IX, p. 126; and PATHOLOGY, Vol. XVIII, p. 394.

AGUESSEAU, HENRI FRANÇOIS D', a distinguished lawyer and chancellor of France, was born at Limoges, Nov. 27, 1668. He was a steady defender of the rights of the people, and of the Gallican Church. He successfully opposed the decrees of Louis XIV and of the chancellor Voisin in favor of the papal bull *Unigenitus*. He died in Paris, Feb. 9, 1751.

AGUILAS, a fortified port in the Spanish province of Murcia, on the Mediterranean, about 50 miles W. of Cartagena. It is the terminus of a railway from the city of Murcia, and has considerable export trade in argentiferous lead, iron ore, sulphur, esparto and figs. There are large smelting-works here. Population, 8,947.

AGUIRRE. Same as LOPE DE AGUIRRE, in these Supplements.

AGUSTINA, "Maid of Saragossa," once a *cantinière* with the troops, attained fame, and also a lieutenancy in the Spanish army, by her services in aid of Saragossa, when that city was besieged by the French, 1808–09. She died in 1857. See ZARAGOZA, Vol. XXIV, p. 770.

AGYNIANS OR AGYNENSES, a sect of Gnostics that arose about 694 and soon disappeared. As the name indicates ("without a wife"), they rejected marriage, and, also, they refused to eat flesh, esteeming both practices to be of diabolical origin.

AHLFELD, FRIEDRICH, gynæcologist; born at Alsleben, Germany, in 1843; graduated at the medical department of Leipsig University in 1868, and became professor of gynæcology in the University of Marburg in 1883. He published treatises on birth-presentations, nursing, malformations, etc.

AHLQUIST, AUGUST ENGELBERT, Finnish philologist, born at Kuopio, province of Kuopio, in the grand duchy of Finland, Aug. 7, 1826. He studied philosophy and philology at Helsingfors, and in 1847 founded a newspaper, the *Suometar*, a Finnish name for his own country. The years 1853–58 were spent in travel through northern Russia and Siberia, and on his return he became professor of Finnish in the University of Helsingfors. He devoted his life to the study of Finnish dialects and to making his native speech an instrument of literature. Besides a Wotish grammar and treatises on the Ural-Altaic languages and the Finnish of the west, he published a volume of native poems, under the title of *Säkeniä*, or *Sparks*, and translations from Schiller.

AHLWARDT, THEODOR WILHELM, a distinguished German orientalist, was born July 4, 1828. In 1861 he was appointed to the chair of oriental languages in the University of Greifswald, his birthplace. He has published several important works on the history and literature of the Orient, chief among which are his *Poetry and Poetic Art of the Arabs* and a remarkable *Catalogue* of the Arabic manuscripts in the royal library at Berlin.

AHMED OR AHMET, sultans. See ACHMET, Vol. I, p. 97.

AHMEDNUGGUR. Same as AHMADNAGAR, Vol. I, p. 423.

AHN, JOHANN FRANZ, educationist, was born at Aix-la-Chapelle in 1796, and died Aug. 21, 1865.

He was the author of a successful method for acquiring modern languages, which bears his name. His *French Grammar for Germans* has gone through more than 200 editions. It was succeeded by similar works on English, Italian and Dutch.

AHNAPEE, city and lake port, Kewaunee County, northeastern Wisconsin; lies 120 miles N. of Milwaukee, with which it is connected by rail *via* Green Bay, located 32 miles S.W. of it. Its principal trade is in lumber and grain. Population 1890, 1,015; 1895, 1,329.

AHNFELD, ARVID WOLFGANG NATHANAEL, Swedish author and journalist, born in Lund, Aug. 16, 1845. He was associate editor of the *Aftonblad* from 1870 to 1881, and since the latter date has been editor-in-chief of *Ur Dagens Krönika.* He is the author of a *Universal History of Literature;* and is now publishing a *Biography of European Artists* (1883 et. seq.).

AHRENS, HEINRICH, born at Kniestedt, Hanover, July 14, 1808, was a German jurist and writer on philosophy and political science. He was educated at Göttingen, became a prominent contributor to the periodicals of the period, and in 1839 professor of philosophy at Brussels. Later he held a professorship at Gratz, and finally became professor of practical philosophy and political science at Leipsic. He published psychological and political treatises and a juristic encyclopædia. His *Cours du Droit Naturel* has been extensively translated, and is used as a basis for academical studies in South American countries. He died in Salzgitter, Prussia, Aug. 4, 1874.

AÏ. See SLOTH, Vol. XXII, p. 161.

AIDÉ, HAMILTON, English poet, novelist, and soldier, was born in Paris in 1830, of Greek-English parentage. He received his academic training in England, afterward studying at the University of Bonn. After seven years' service in the British army he retired with the rank of captain, thenceforward devoting himself to romance and poetry. The best known of his poems are *Eleanore*, and *Songs Without Music;* among his novels; *Rita; Passages in the Life of a Lady;* and *The Marstons.*

AIDE-DE-CAMP, a confidential officer attached to the personal or private staff of a general. In the United States service, six, having the rank of colonels, are allowed to a general; to a lieutenant-general, two, and a military secretary, who rank as lieutenant-colonels; to a major-general, three, ranking as captains or lieutenants; to a brigadier-general, two, ranking as lieutenants. These officers are generally in the complete confidence of their commander, whose orders they write and whose person they often represent. The position requires an intimate acquaintance with army details, accurate judgment, and a moderate degree of diplomacy. In time of battle the aide must have a precise knowledge of the ground being fought over and the disposition of all troops upon it. An admiral's aide-de-camp is his flag-lieutenant. See AIDE-DE-CAMP, Vol. I, p. 425. See also ARMY, Vol. II, p. 577.

AIDING AND ABETTING, in criminal law, is the offense committed by those who are actively or constructively present at the time a crime is committed, doing some act to aid or counsel and procure the thing to be done. Persons guilty of this offense are considered principals in the second degree, except in the crime of high treason and in misdemeanors, where they are considered principals in the first degree. A person guilty of aiding and abetting in the commission of a crime cannot be punished under a statute providing punishment for such crime, unless the statute also applies to all who are guilty of assisting, and not alone to those who actually commit the crime.

AIDONE, a town of east-central Sicily, in the province of Caltanissetta, lying 33 miles inland from the Gulf of Catania. The nearest railway passes eight miles north of it. The Lombards who accompanied Roger the Norman in his conquest of Sicily established the town at an important strategic point, which overlooks the picturesque plain of Catania. Population 1895, 6,996.

AIGNAN, ÉTIENNE, a French publicist and *littérateur*, was born at Beaugency-sur-Loire in 1773. He became a member of the Academy in 1814. He executed an excellent translation of the *Iliad* into his native tongue, and wrote an important work entitled *The Condition of the Protestants in France.* He died in 1824.

AIGRETTE, in botany, a term used to denote the plume or down which is attached to many fruits or seeds, as, for instance, the dandelion and the thistle. In English zoölogy the name is applied to a white heron, an elegant bird with a white body and feathery crest. It is also used in reference to the feathery tuft on the heads of several birds. Also written Aigret or Egret. See HERON, Vol. XI, p. 760.

AIGUEBELLE, a town of east-central France, in the department of Savoy. It lies moderately up in the Graian Alps and is on the river Arc. It was the scene of the defeat, in 1742, of Duke Charles Emmanuel III, of Savoy, by the French and Spanish armies, and the site of Napoleon's commencement of operations in building the road over Mont Cenis. Population 1895, 1,080.

AIGUEBELLE, PAUL ALEXANDRE NEVEUE D', a French naval officer who entered the Chinese service during the Taiping Rebellion in 1863, became a mandarin of the highest rank, and for whom was especially created the title of grand admiral of the Chinese fleets. He was of much service in reorganizing the Chinese navy upon the European plan. He was born in 1831, and died at Paris in 1875.

AIGUES-MORTES, a town of southeastern France, lying in marshy ground, in the department of Gard, which the Roman Marius is supposed to have founded. It is 3 miles from the Mediterranean Sea, with which it is connected by a canal, and is connected by rail with Nîmes, 22 miles N.E. of it. St. Louis sailed from Aigues-Mortes in 1248, and again in 1270, for the Crusades. Here Francis I met the Emperor Charles V in 1538. The fortifications of the town, built by

Philip III in 1270, are of great archæological interest. Wine and salt are its chief exports. Population 1891, 3,981.

AIGUILLON, ARMAND VIGNEROT DUPLESSIS RICHELIEU, DUKE OF (1720–1782), statesman and prime minister of France under Louis XV. Through the influence of the Countess du Barry, the king's mistress, he was made minister of foreign affairs in 1771, succeeding Choiseul. See DU BARRY, Vol. VII, p. 494.

AIGUILLON, ARMAND DE VIGNEROT DUPLESSIS RICHELIEU, DUKE OF, a son of the preceding; born in 1750; was conspicuous for his republican sympathies at the outbreak of the Revolution. Despite his renunciation of the privileges of nobility, he was proscribed in 1792, and saved his life by flight to England. Died at Hamburg May 4, 1800. See LA CHALOTAIS, Vol. XIV, p. 191.

AIKEN, capital of a southwestern county of South Carolina having the same name, is on the South Carolina and Georgia railroad, 18 miles E. of Augusta and 120 miles N.W. of Charleston. It has good educational facilities for both white and colored students, being the seat of Aiken Institute, Schofield Normal School, and Immanuel (colored) Training School. It is also a popular health resort, especially for patients with pulmonary complaints. It lies on a plateau about 600 feet above sea-level, and enjoys a perfect system of natural drainage. Population 1890, 2,362.

AIKEN, CHARLES AUGUSTUS, American educator and theologian, was born in Manchester, Vermont, Oct. 30, 1827; graduated from Dartmouth College and Andover Theological Seminary, going from the latter place to the pastorate of the Congregational Church at Yarmouth, Maine. He became professor of Latin language and literature at Dartmouth in 1859, and at the College of New Jersey in 1866; president of Union College in 1869; afterward professor of Christian ethics and apologetics in the Princeton Theological Seminary, where he was the author of many Biblical writings and critical reviews. Died Jan. 14, 1892.

AIKEN, WILLIAM, a wealthy South Carolina planter who became governor of his state (1844–46), and representative in Congress (1851–57), was born in Charleston in 1806, graduated from South Carolina College, and soon became prominent in state politics as an ardent Democrat. He was noted in public life for his philanthropy, his public spirit, and the moderation of his views. He was opposed to secession. He was re-elected to Congress in 1866, but was refused a seat. Died at Flat Rock, North Carolina, Sept. 7, 1887.

AIKINS, JAMES COX, Canadian statesman, was born March 30, 1823, in the township of Toronto, in Ontario. Shortly after his graduation from Victoria College he was elected to represent his native county in the assembly, where he remained from 1854 until 1861. He then became a member of the legislative council, in which body he sat until its abolition, when he became a member of the senate. He was made a privy councilor in 1869, holding the secretaryship of state from that time until the Macdonald ministry went out of power. Upon its return in 1878 he resumed his portfolio, resigning it two years later to become minister of inland revenue. He was lieutenant-governor of Manitoba from 1882 to 88, retiring from public life with the expiration of that term of office.

AILANTHUS SILKWORM. See SILK, Vol. XXII, p. 60.

AILANTUS, a genus of trees of the family *Simarubaceæ*, natives of southeastern Asia. The best-known species is *A. glandulosa*, the "tree of heaven," or "Chinese sumach." It was introduced in the middle of the eighteenth century into France, Italy, Germany, Britain and the United States. It grows rapidly, has very long pinnate leaves, and is easily propagated by suckers and cuttings of the roots. In the United States it has become a pest in many places, owing to its rapid spreading and unpleasant odor. The wood is suited for cabinet-making, and the leaves afford nutriment to a species of silkworm (*Bombyx cynthia*).

AILLY, PIERRE D', OR PETRUS DE ALLIACO, "The Eagle of the Doctors" (*Aquila Doctorum*) of France, and the "Hammer of Heretics" (*Malleus Hæreticorum*), theologian and nominalist philosopher; born at Ailli-le-haut-Clocher in 1350. He was educated at the University of Paris, and in 1389 he become chancellor of that institution, and almoner and confessor of Charles VI. In 1411 he was made cardinal, and was sent as papal legate to Germany. He was among the leaders in the Council of Constance in 1414, where he headed the reform party, but agreed to the sentence on Huss and Jerome of Prague. He died at Avignon, Aug. 9, 1420. See MYSTICISM, Vol. XVII, p. 132, and SCHOLASTICISM, Vol. XXI, p. 431.

AIMARD, GUSTAVE, novelist; born in Paris, Sept. 13, 1818. He came to America in his boyhood, spending 10 years of adventure in Arkansas and Mexico, which furnished themes for most of his novels; he also traveled in Spain, Turkey and the Caucasus; served as officer in the French army, and, after several years' confinement in an asylum at Paris, died June 20, 1883. His novels, which are strikingly comparable to those of Cooper, include *The Adventurers*, *The Arkansas Trappers*, etc. Twenty-six of them have been translated into English.

AIN, a river in France which has its source in the Jura Mountains and flows through the departments of Jura and Ain; after a course of 118 miles it falls into the Rhône, 18 miles above Lyons.

AINSLIE, HEW, Scottish-American poet; born in Bargeny Mains, Ayrshire, April 5, 1792. He came to America in 1822, and resided for a while in the Owen Community at New Harmony, Indiana. His best-known books are *A Pilgrimage to the Land of Burns* (1820), and *Scottish Songs, Ballads and Poems* (1855). He died in Louisville, Kentucky, March 11, 1878.

AINSWORTH, capital of Brown, a north-central county of Nebraska; is on the Fremont,

Elkhorn and Missouri Valley railroad, 250 miles N.W. of Omaha. Population 1890, 733.

AINSWORTH, WILLIAM FRANCIS, physician, explorer, and geologist; born at Exeter, England, in 1807. Studied medicine at Edinburgh, interrupting his course for foreign travel. Having received his degree, he traveled extensively in the East, becoming attached, in 1835, to an expedition to the Euphrates. Later, for the Geographical Society, he traveled extensively in Asia Minor and Kurdistan. He was in England at the time (1832) of the appearance of cholera at Sunderland. His work *On Pestilential Cholera* is based upon observations made at that time. Has also published *Researches in Assyria, Babylonia and Chaldea; Travels in the Track of the Ten Thousand Greeks*, and numerous works of a similar nature.

AINSWORTH, WILLIAM HARRISON, novelist; born at Manchester, England, Feb. 4, 1805; was educated for the legal profession, but while studying law in London he married a publisher's daughter (1826) and engaged in the publishing business. He became a distinguished author, his first hit being *Rookwood* (1834), with its characteristic story of *Dick Turpin's Ride to York.* He was the editor of *Bentley's Miscellany; Ainsworth's Magazine;* and the *New Monthly*, successively. He wrote 39 novels, 7 of them being illustrated by Cruikshank, and many of them originally appeared in the publications which he edited; *Crichton* (1837), *Tower of London* (1840); *Tower Hill* (1871); and *Beau Nash* (1880), being prominent among these. He died at Reigate, England, Jan. 3, 1882.

AIR–BRAKE. See BRAKE, in these Supplements.

AIR CAVITIES, often wrongly called air-cells. In plants they consist chiefly of cavities found in the ground-tissue, and are formed in various ways. In terrestrial plants they communicate with the exterior by means of the stomata, an interchange being thus established between the internal living cells and the outer air, which aids the passage of gases. They are specially developed, however, in aquatic plants, in which they may develop some member into a float.

AIR–COMPRESSORS, AND USES OF COMPRESSED AIR. The air-compressor is not a remarkable machine in its construction or details. It much resembles a steam-engine, only that it operates on a reverse principle, in that it condenses a fluid with a piston instead of using a condensed fluid to drive a piston. In practice it is usually a steam-engine having two tandem cylinders, one of which is a steam-cylinder driving a piston in the usual way. An extension of the same piston-rod enters the air-cylinder, where air is taken in and compressed by means of a valve-motion operating in a manner the reverse of the valve in the steam-cylinder.

It is the great number of new uses found for compressed air within the past 15 years that renders this subject of present interest. It is an old form of power, which came into extended use after electric-power had opened the way by demonstrating that there were better methods of carrying power than by means of shafting, belts, etc. A few years ago the principal use of compressed air was for furnishing ventilation to mines, tunnels and caissons. To-day it is used to drive street-cars, for package-delivery, in operating many kinds of machine-tools, the operation of various small machines, the moving of liquids, in stone-dressing, riveting, spraying-devices, painting, discharging dynamite cartridges and torpedoes, and a hundred minor purposes.

Three railways in France and one in Switzerland are run by compressed-air power. One is running and others are projected in the United States. The plan is to make use of large storage-tanks placed under the bodies of the cars, and to use the pressure from them in cylinders, just as steam is used in the cylinder of a steam-engine. The difficulties of the system lie in the weight of the storage-tanks and the frequent charging required. Its advantages are the automobility of the car, freedom from noise, dirt and smoke, and correct operation regardless of weather. It has been proven that they may be run eight or nine miles on the level, but in practice it is found desirable to recharge the tanks about once in each mile and a half of travel. This is done at stations without any serious delay. The tanks are built of great strength, it being necessary to charge them with a pressure of about two thousand pounds to the square inch.

Pneumatic-delivery systems are in use in several of the large cities of Europe, and in New York, Philadelphia and Chicago. In some respects the Philadelphia plant is the most remarkable, making use of the largest pipes known to such service. It was installed in 1893, for the use of the post-office, and the original line was half a mile long, but an extension is projected for the convenience of business firms. The tubes of this system are 6½ inches in diameter, while most of the systems are from 1½ to 3 inch tubes.

Many large machine-shops, railroad-shops, and the like, use compressed air to operate cranes, hoists and large machines generally. This form of power entails very little cost for the hours when the power is not wanted, and lends itself to a number of peculiar uses, such as the hoisting of oil from barrels by turning in a stream of air, the cleaning of steam-passages, the sweeping of floors, dusting of offices, etc. For cleaning dusty railway-cars it has no equal, being turned on with a hose, and driving out the dust just as readily as a pavement is washed with a hose and water.

The reliability of compressed air has led to its use in many mechanisms where absolute certainty of working is essential, as in the operation of switch and signal systems. Formerly such service was interfered with by the gathering of moisture in the pipes, which would freeze in cold weather, but various devices have been introduced that have overcome this danger.

For the operation of portable tools compressed air is obviously most convenient, since the tool can be connected by means of a flexible hose with its source of compressed air. It is largely used in

driving calking-tools for use in calking boilers, tanks, and the like, the seams or joints of which have to be calked or hammered tight.

A stone-dressing tool was introduced in 1894, which is driven by compressed air, and which operates so satisfactorily that it is driving out hand-labor. Before its introduction it was found impracticable to dress stone down to a level by any machine, because the stone would usually fracture, as a result of the lack of intelligence on the part of the machine. With the compressed air stone-dresser, however, it is necessary to dress only the edges of a stone by hand, the rest being reduced to a level surface by repeated rapid blows of the machine, guided by an attendant. The amount of stone removed at a blow is so perfectly regulable that even carving may be done with the machine, by the use of suitable reverse dies to guide the chisels.

Sprayed petroleum is much used as a boiler fuel in some localities, and compressed air is the motive power employed in the spraying. The amount of pressure can be adjusted by simply turning a cock, and it is easy to maintain a uniform heat with such a spray. The operations of tempering, welding, japanning, brazing, etc., demand a uniform heat, and therefore this aërated petroleum spray has come to be used in those lines of work.

A new system of moving fluids by compressed air has been patented. It has been used to advantage in artesian wells, the method being to force the air down the well in a small side-tube, introducing it into the pipe proper of the well at the bottom, with an upward curve of the air-tube. The upward rush of the air, in its effort to reach the surface, results in its carrying the water up with it, and at the same time aërating and purifying the water, and leaving behind all objectionable mud and sand. This system is in use at Rockford, Illinois, and at Wayne, Pennsylvania. There are other places in the United States, as Little Rock, Arkansas, where the water-supply is purified by aëration, compressed-air plants being installed for that purpose.

Another interesting use of compressed air is in the manufacture of cellulose silk, which is made from wood-pulp by air-pressure. The pulp is forced out of minute holes, in a filament so tiny that six of them have to be twisted together to form a thread suitable for weaving.

Under the most favorable conditions, compressed air can be delivered to customers, for use as power, at a cost of from thirty to fifty dollars per horse-power per year, and its use is steadily increasing. CHARLES H. COCHRANE.

AIR-GUNS. See AIR-GUN, Vol. I, p. 428, and DYNAMITE GUNS, in these Supplements.

AIR-LOCK. In the construction of bridge-piers under water, hollow iron cylinders are used, in which it is now the custom to use condensed air, the pressure usually not exceeding two atmospheres beyond ordinary atmospheric pressure. This iron shell is open at the bottom, but, being air-tight and water-tight at all other points, water is prevented from rising in it. It is necessary to have, in some part of this caisson, a chamber to allow of the entrance and exit of men and materials. This small chamber is called an air-lock. When the outer door is closed after entrance, the air of the chamber is compressed before opening the inner one.

AIROLO, a town of south-central Switzerland, lying in the upper valley of the Ticino, and at the southern mouth of the great St. Gotthard railway tunnel. Lucerne is 38 miles N.W. of it, and Lake Como 43 miles S.E. It was the scene of a battle between the French and Russian forces on Sept. 13, 1799. Population, 3,674.

AIR-PLANTS, a common name applied to aerophytes and epiphytes, which see, in these Supplements.

AIR-SACS, remarkable cavities connected with the respiratory system in birds. They are distributed along the inside of the whole cavity of the chest and abdomen. In birds of rapid flight and strong wing they often send prolongations into the bones, so reducing weight and aiding the bird in its flight. The sacs, or air-cells, in the lungs of the mammalia, into which the air is conveyed by minute ramifications of the windpipe, in order to be brought into contact with the blood distributed on their walls, are very small, being about only one thousandth part of an inch in diameter in man. In insects they form a spiral fiber within a membranous coat. The term is also used of spaces in the tissue of aquatic plants and of the *bladders* of seaweeds.

AIRSHIPS. See AERONAUTICS, Vol. I, p. 185.

AIRY, SIR GEORGE BIDDELL, English astronomer; born July 27, 1801, at Alnwick, in Northumberland; was educated at the Colchester Grammar School and Trinity College, graduating as senior wrangler from the latter institution in 1823. He was put in charge of the Cambridge Observatory (newly erected) in 1828, by virtue of his election to the Plumian professorship. Three years previously he devised a remedy for the optical malady in the human eye which afterward received the name of "astigmatism." In 1836 he succeeded Pond as astronomer royal at Greenwich, and was created Knight Commander of the Bath in 1872, being then president of the Royal Society. Later he conducted the astronomical observations preparatory to the definition of the boundary between the United States and Canada, and aided in tracing the Oregon boundary; established the system of correcting the disturbance of the compass in iron-built ships which is now universally adopted; was chairman of the commission appointed to superintend the construction of new standards of length and weight after the destruction by fire in 1834 of the former national standards. He attained great fame by his researches in magnetism, meteorology, photography, etc. His principal works are *Gravitation; Mathematical Facts; Ipswich Lectures on Astronomy; Treatise on Sound; Treatise on Partial Differential Equations; Vibrations; Treatise on Magnetism;* and a *Trigonometry.* His last work was *Notes*

*on the Earlier Hebrew Scriptures*, published in 1876. He retired in 1881 on a pension of eleven hundred pounds, and died at Greenwich, Jan. 2, 1892.

AIST, DIETMAR, one of the earliest of the German minnesingers; mentioned in writings between 1143 and 1170. By birth he was an Austrian. The few things written by him which are extant are in Lachmann and Haupt's *Des Minnesangs Frühling*.

AITCHISON, GEORGE, architect, was born in London, and graduated from the university of that city in 1850; studied architecture, and traveled on the Continent from 1853 to 1855; became a fellow of the Royal Institute of British Architects in 1862, and associate of the Royal Academy in 1881. Mr. Aitchison has gained many medals, one of which was received at Chicago in 1893. His decorative designs at Kensington Palace, in Sir Frederic Leighton's house, and the Living Hall of the Goldsmiths' Company are highly regarded.

AITCHISON, JAMES EDWARD TIERNEY, Brigadier-Surgeon, was born in 1835; graduated M.D. at Edinburgh in 1856; entered Bengal medical department in 1858; attained his present rank in 1885, and retired in 1888. He acted as naturalist with the Afghan delimitation commission and as botanical collector throughout his connection with the army. He has written *A Catalogue of the Plants of Punjaub and Sindh; Flora of the Thelum District; Flora of the Kuram Valley*; and numerous other valuable additions to botanical knowledge.

AITKEN, SIR WILLIAM, physician; born at Dundee, Scotland, April 23, 1825; was graduated from the University of Edinburgh, taking his medical degree in 1848; became demonstrator of anatomy at Glasgow, holding that office until April, 1855, when he volunteered for hospital service in the Crimean War, afterward becoming professor of pathology in the Army Medical School. In 1875 he was elected a fellow of the Royal Society, received the degree of LL.D. from the University of Edinburgh, and had knighthood conferred upon him in 1887, the year of the Queen's jubilee. He has been mainly occupied as a teacher and investigator in anatomy and pathology, being the author of *On the Pathological Connections and Relations of Epidemic Disorders in Man and the Lower Animals*, *a Handbook of Science and Practice of Medicine*, etc. Died June 25, 1892.

AITKIN, capital of Aitkin County, in central Minnesota. It is 135 miles N. of Minneapolis and within 145 miles of the head of navigation on the Mississippi River; the Northern Pacific railroad connects it with Duluth, which is 78 miles E. It is a lumber town, lying in the midst of a picturesque lake region. Population 1895, 1,670.

AJALON, a town of the Levites, in the land of Dan in ancient Palestine. It was here that the battle between Joshua and the five Canaanitish kings took place, in which it is narrated that Joshua bade the sun and moon to stand still. The modern village of Yalo, 12 miles from Jerusalem, is believed to occupy its site.

AJODHYA, an ancient city and former capital of Oudh, a north-central province of India, is situated on the right bank of the Gogra, in the vicinity of Faizabad, which is connected by rail with Lucknow, 75 miles to the west. Its site is said to have covered 96 square miles, now marked by heaps of ruins overgrown by jungle. The modern town of Ajodhya has 7,500 inhabitants, nearly 100 temples, and the fair of Ramnami, which attracts half a million pilgrims yearly. See FAIZABAD, Vol. VIII, p. 855; OUDH, Vol. XVIII, p. 71.

AKBARPUR, a town of north-central India, in the British district of Cawnpur, and capital of a pergunnah of the same name. It is situated on the river Sarpe, a tributary of the Ganges, and is 100 miles E. of Lucknow, with which it is connected by rail. Population, 6,000. See CAWNPUR, Vol. V, p. 277.

AKEE, the *Cupania sapida*, a fruit-tree belonging to the family *Sapindaceæ*, a native of Guinea, but now distributed throughout the West Indies and South America. The black seeds are imbedded in a white, spongy aril, which, when cooked, is prized as food. It is also used as a remedy in diarrhœa, while the distilled water of the flowers is used as a cosmetic by the negro women.

AKERMAN, AMOS T., a lawyer and politician, born in New Hampshire in 1823. Having practiced law in Georgia for several years before the war, his sympathies were with the South. He advocated, however, the acceptance of the reconstruction measures of Congress, and was a prominent member of the Georgia convention of 1867 which formed the new state constitution. He was attorney-general under Grant (1870–72). Died at Cartersville, Georgia, Dec. 22, 1880.

AKERS, BENJAMIN PAUL, American sculptor, born in Saccarappa, Westbrook, Maine, July 10, 1825. He took lessons in Boston in modeling, his first work being a head of Christ, which was afterward put in marble. He located in Portland and made portrait busts of Henry W. Longfellow and of many other personages of note, as well as a head of Charlotte Corday and a bas-relief entitled *Evening*, both of which were masterpieces. He studied a year in Florence, where he made several busts, and a *Morning* as a companion to *Evening*. While there he also put in marble several of his previous works. In the winter of 1853–54 he modeled his *Benjamin in Egypt*, and while in Washington the busts of many noted men of the time. In 1855 he traveled through Europe, making, in two years, *Peace; Una and the Lion; Girl; Pressing Grapes; Isaiah; Milton; Dead Pearl-Diver; Diana and Endymion; Saint Elizabeth of Hungary; Reindeer;* and Schiller's *Diver*. His constant labors on damp clay in a sunless studio impaired his health, and he died in Philadelphia, Pennsylvania, May 21, 1861.

AKHLAT, a town of Armenia, Asiatic Turkey; lies on the western shore of Lake Van, and is 240 miles S.E. of Trebizond and the Black Sea. The old city of Akhlat was the residence of many

kings of Armenia, and the scene of many conflicts between the Greeks, Armenians and Persians. It was taken and devastated in 1228 by Jelal-ud-deen, and completely destroyed by an earthquake in 1242. In some writings it is referred to as Arjish or Ardish. Population, 4,000.

AKJERMANN. Same as AKERMAN, Vol. I, p. 436.

AKKA, a race of pygmies discovered by Schweinfurth in the Nepoko River region, in Central Africa. See BUSHMEN, Vol. IV, p. 575. See also article on AFRICA, in these Supplements.

AKMOLINSK, a Russian government district in southwestern Siberia, lying on the Kirghiz steppe. Area, 229,609 miles; population, 500,180. The capital and chief town bears the same name, and has a population of 3,130. See RUSSIA, Vol. XXI, p. 67.

AKRAGAS, the Grecian name for a town of Sicily, the Agrigentum of the Romans. See AGRIGENTUM, Vol. I. p. 417; GIRGENTI, Vol. X, p. 623.

AKRON, capital of Washington County, Colorado; lies 88 miles N.E. of Denver, with which it is connected by rail. Population 1890, 599.

AKRON, a city of northeastern Ohio, lying on the highest elevation between Lake Erie and the Ohio, is 36 miles below Cleveland, on the Ohio and Erie canal, and is the point of intersection of four lines of railway. Here is located the printing establishment of The Werner Company, publishers of this ENCYCLOPÆDIA, and one of the largest concerns of its kind in the world. It is the seat of Buchtel (Universalist) College, and other institutions in keeping with a progressive city of its importance. Its factories, the value of the products of which amounts to $16,000,000 annually, employ 7,000 hands. Population 1880, 16,512; 1890, 27,601. See AKRON, Vol. I, p. 437.

AKSHEHR, a city of east-central Asia Minor; located on an important route from Syria to Constantinople; lies at the foot of the Sultan Dagh Mountains and five miles south of Akshehr Lake. The nearest town of importance is Konieh, 70 miles to the southeast. Population, 15,000. It is also referred to as Akscheher and Aksher.

ALABAMA, a river of Alabama. See ALABAMA, Vol. I, p. 438.

ALABAMA, STATE OF. Area, 52,250 square miles; population 1880, 1,262,505; 1890, 1,513,017,




of whom 830,796 were whites and 681,431 colored. Capital, Montgomery. Alabama was so named from a Creek or Muskhogean word meaning "Here we rest." After the suppression of the Creek rebellion of 1814 and the admission to the Union in 1819, Alabama enjoyed increasing prosperity, uninterrupted until her secession in 1860. In 1861 the convention of Southern states met at Montgomery, made it the capital of the Confederacy, organized the provisional government, and elected Jefferson Davis president. During the Civil War battles were fought in Alabama, at Mobile, Selma, Talladega, Tuscumbia, Montevallo, Scottsboro, Athens, and in Mobile Bay. Under the reconstruction act, state conventions met in 1865 and 1867; and in 1868 a new constitution was submitted to the people and adopted, and the state was readmitted to representation in Congress.

Alabama lies almost entirely within the Gulf Slope. Its northern section, except the rich agricultural and grazing land of the Tennessee valley, is widely and picturesquely broken, and contains rich mineral deposits and many mineral springs. The middle section is level, declining toward the Gulf, and includes the great cotton belt and the principal corn-producing district. South of this are the vast pine forests, and a light soil, yielding grain and semi-tropical and other fruits. The agricultural products of the state include, also, large quantities of tobacco, cereals, sugar-cane and ramie. The forests, streams and bays produce large quantities of game and fish. Lumber, staves and railroad ties are exported through Mobile, the only port of entry. The principal manufactures are of cotton goods, iron, lumber and machinery. Mobile's chief export is cotton; annual value, about $15,000,000.

In 1890 Alabama was the seventeenth of the United States in population, and sixteenth in value of agricultural products. In output of coal (4,500,000 tons) Alabama was sixth; in production of cotton, fourth; in number of acres under cultivation, third, the number of farms having doubled during the last decade. The recent development of the iron industry, of which Birmingham is the center, has been remarkable. In 1890 Alabama ranked second in output of this mineral, 1,877,815 tons of ore having been mined in that year. In 1891 the production of pig-iron was 891,154 tons, and of rolled iron 34,022 tons. In 1886 the state had 2,105 miles of railway; in 1891, 3,611. The chief cities and their populations are: Montgomery, 21,883; Mobile, 31,076; and Birmingham, 26,178.

The state has not been able to increase the appropriation for education as fast as the increasing population has demanded, and schools in the rural districts have been at a standstill. Normal schools are located at Marion, Florence, Huntsville and Tuskegee. Tuscaloosa is the seat of the University of Alabama; Auburn, of the Agricultural and Mechanical College; Mobile, of the State Medical College; Greensboro, of the Southern University. The state has a blind asylum at Mobile, an institute for the deaf, dumb and blind at Talladega, and an insane asylum at Tuscaloosa. The public and principal private libraries contain more than half a million volumes. In 1892 there

were in the state 187 newspapers, 16 of them being dailies. Of religious denominations, the Baptists are the strongest, others being well represented. The penal system, formerly bad, has been improved in recent years, the employment of convicts in the mines having been made illegal. In the summer of 1894, striking coal-miners in the northern part of the state having killed negroes employed in their places, Governor Jones kept the militia at the scene until order was restored. The elections of 1892 and 1894 were marked by a bitter fight against the regular Democracy by the fusion of disaffected Democrats and Republicans and Populists of the state, whose nomination of Reuben F. Kolb for governor was finally defeated, although both Kolb and the regular Democratic nominee Oates claimed for a time to be elected.

GOVERNORS OF ALABAMA: William W. Bibb, 1819–20; Thomas Bibb, 1820–21; Israel Pickens, 1821–25; John Murphy, 1825–29; Gabriel Moore, 1829–31; John Gayle, 1831–35; Clement C. Clay, 1835–37; Arthur P. Bagby, 1837–41; Benjamin Fitzpatrick, 1841–45; Joshua L. Martin, 1845–47; Reuben Chapman, 1847–49; Henry W. Collier, 1849–53; John A. Winston, 1853–57; Andrew B. Moore, 1857–61; John G. Shorter, 1861–63; Thomas H. Watts, 1863–65; Lewis E. Parsons, 1865; Robert M. Patton, 1865–68; William H. Smith, 1868–70; Robert B. Lindsay, 1872; David P. Lewis, 1872–74; George S. Houston, 1874–79; Rufus W. Cobb, 1879–81; Edward A. O'Neal, 1882–84–86; T. Seay, 1886–88–90; T. G. Jones, 1890–94; W. C. Oates, 1894–96; J. F. Johnston, 1896.

The population of the state in 1820 was 127,901; 1850, 771,623; 1880, 1,262,505; 1890, 1,513,017.

See ALABAMA, Vol. I, p. 438.

ALABAMA, ALIBAMO, ALIBAMON OR ALIBAMOU, as variously written, that branch of the Muskhogean or Creek stock of Indians who, according to the historian Pickett, having been originally driven out of Mexico by the Spaniards, settled in the region of the Alabama River, near where the city of Montgomery is located. Here they were reduced by constant warfare, finally joining in the Creek rebellion of 1812–14, after the suppression of which they emigrated westward, and are now mostly settled in Polk County, Texas, where they have adopted the habits of the whites.

ALABAMA CLAIMS. The settlement of the claims of the United States against Great Britain, known as the *Alabama* Claims, by a tribunal of arbitration, was one of the most important international events of modern times. These claims arose from the depredations upon American commerce during the Civil War, by vessels which either had been fitted out in British ports under the direction of the Confederate government, or received into them and there allowed supplies exceeding the maximum amount stated in the proclamation of neutrality made by the British government. The *Alabama*, the *Florida* and the *Georgia*, built by Laird and Son, were of the former class; the *Sumter*, the *Nashville*, the *Retribution*, the *Tallahassee* and the *Chickamauga* were of the latter. Besides these, there was included the *Shenandoah*, known earlier as the British *Sea-King*. She, having been irregularly armed and taken in command by Captain Waddell, of the Confederacy, ran into Melbourne, where she coaled, repaired, and enlisted 45 men. This was done in the face of numerous protests by the United States consul at that point.

The interference demanded at this time by the United States was refused by Lord John Russell, on the ground that he had no authority beyond the Foreign Enlistment Act, under which only judicial proceedings could be made, thus making it incumbent upon the United States government to begin proceedings in British law-courts.

In 1871, in consequence of negotiations reopened by Secretary Hamilton Fish, a joint commission, consisting of five representatives of each government, sat at Washington. The treaty drawn up by this joint high commission on May 8, 1871, styled the *Alabama* Claims "differences which had arisen between the two governments, and still existed, having grown out of the acts committed by several vessels, which gave rise to the claims known as the *Alabama* claims." For the government of a tribunal of arbitration "Three Rules Relating to Neutrals" were adopted by the parties to the before-mentioned treaty. The rules are as follows:

"A neutral government is bound,—

"1. To use due diligence to prevent the fitting out, arming or equipping, within its jurisdiction, of any vessel which it has reasonable ground to believe is intended to cruise or carry on war against a power with which it is at peace; and also to use like diligence to prevent the departure from its jurisdiction of any vessel having been specially adapted, in whole or in part, within such jurisdiction, to warlike uses.

"2. Not to permit or suffer either belligerent to make use of its ports or waters as the base of naval operations against the other, or for the purpose of the renewal or augmentation of military supplies or arms or recruitments of men.

"3. To exercise due diligence in its waters, and as to all persons within its jurisdiction, to prevent any violation of the foregoing obligations and duties."

The tribunal of arbitration was composed of five members: Sir Alexander J. E. Cockburn, appointed by the Queen; Charles Francis Adams, appointed by the President of the United States; Count Frederic Sclopis, appointed by the King of Italy; M. Jacques Staempfli, appointed by the President of the Swiss Confederation; and Viscount d'Itajuba, appointed by the Emperor of Brazil. The court met at Geneva, Switzerland, Dec. 15, 1871, and not until September 14th of the following year was the final conclusion announced. The case was argued for the United States by William M. Evarts, Caleb Cushing and Morrison R. Waite; for Great Britain by Sir Roundell Palmer, later appointed Lord High Chancellor, and raised to the peerage as the Earl of Selborne. Mr. J. C. Bancroft Davis, of the United States,

and Lord Tenterden, of Great Britain, attended the tribunal of arbitration as agents of their respective governments. The tribunal refused to consider consequential claims, but for "losses growing out of the destruction of vessels and their cargoes by the insurgent cruisers, and the national expenditure in pursuit of those cruisers," it awarded $15,500,000, to be paid by the British government in compensation to the United States. The decision was signed by all the arbitrators except Sir Alexander J. E. Cockburn, of England. It gave general satisfaction in the United States, and is believed to have furnished a lasting guaranty of international peace.

ALABASTRUM, a type of vase common among relics of ancient Greece. Originally so called because made of alabaster; later the term was used of any small, elongated vase rounded at the bottom and having a winglike expansion around the reduced orifice. See Matt. xxvi. 7.

ALACOQUE, MARGUERITE MARIE, a French nun (1647–90), the founder of the devotion of the Sacred Heart of Jesus, the emblem in the Catholic Church of the divine love for men.

ALA DAGH ("beautiful mountain"), a range of the great tableland of Erzerum, in Turkish Armenia, north of Lake Van. The Murad, the eastern head-stream of the Euphrates, rises on its northern slope. It greatest elevation is about 11,000 feet. Agri Dagh, or Mt. Ararat (17,112 feet), is 15 miles north of its eastern end.

ALAGON, a river in west-central Spain, about 120 miles in length, emptying into the Tagus, just above Alcantara, after draining the plains of Placencia. It is noted for its fine trout. A railroad from Lisbon terminates within eight miles of it. It is also referred to as Allagan.

ALAKUL, an upland lake in eastern Turkestan, a Russian province in west-central Asia. Lies 2,500 feet above sea-level; is 40 miles long, and 17 broad. Same as Alakool, Alaktoo-Kool, Koorghi-Nor, or Alakt-Ugul-Nur.

ALAMAN, LUCAS, Mexican statesman and historian, born in the state of Guanajuato, Oct. 18, 1792. He was graduated at the College of La Concepción, and at the Mexican School of Mines, and traveled through Europe. He was minister of foreign affairs in 1825, and again in 1830. He gave his support to Santa Ana, and became minister of foreign affairs in 1853. He published *Dissertations on Mexican History*, and also the standard history of that country, *Historia de Méjico*. He died in Mexico, June 2, 1853.

ALAMANDA, a tropical American genus of *Apocynaceæ*, cultivated in hot-houses. *Alamanda cathartica*, a native of the West Indies, has violently emetic and purgative qualities.

ALAMEDA, a city in Alameda County, California, on San Leandro Creek, on the Alameda branch of the Central Pacific railroad, about eight miles east of San Francisco, across the bay. It contains a high school and two newspapers. Ship-building and the refining of petroleum and borax are the chief industries. Population 1890, 11,165.

ALAMGIR. See AURUNGZEBE, Vol. III, p. 99.

ALAMO, THE, often spoken of as "The Thermopylæ of America," is a fort in San Antonio, Texas, celebrated as the scene of a fierce combat, in which, from Feb. 11 to March 5, 1836, a few Texans resisted an overwhelming force of Mexicans, until, reduced to a hopeless remnant of six, these were compelled to surrender, and were butchered by their captors. "Remember the Alamo!" became the Texan war-cry.

ALAMOSA, a small town in Conejos County, Colorado, 130 miles S. W. of Pueblo. It has four churches, two banks and a newspaper. Population 1890, 973.

ALAPAYEVSK OR ALAPAEVSK, a town of Russia, just beyond the Ural Mountains, in Asia, government of Perm, on the Alapaika, about 50 miles N.W. of Irbit. It has large iron-foundries. Population, 5,447.

ALARCON, PEDRO ANTONIO DE, Spanish author and politician, was born at Guadix, Spain, March 10, 1833, and early devoted himself to journalism. In 1859 he served as volunteer in the Morocco campaign; he entered the Cortes as Liberal deputy for his native town, and worked for the restoration of the constitutional monarchy in the person of Alfonso XII, who later made him a councilor. Of his novels, the best known are *La Alpujarra*, *El Escándalo*, and *El Sombrero de Tres Picos*. Alarcon died July 20, 1891.

ALARMS. See FIRE-ALARMS, in these Supplements.

ALARM–THERMOMETER, ELECTRIC. Recently an electric alarm has been applied to thermometers, causing them to sound an alarm whenever the temperature rises above or falls below any required point. It is designed for use in offices, schools, hospitals, breweries, and all places where the maintenance of an equable temperature is desired. The electrical alarm can be arranged to sound at any distance from the thermometer, and the device can thus be used to sound an alarm in case of fire. As to alarm-clocks, see CLOCKS, Vol. VI, p. 24.

ALASKA. For early history and general description, see ALASKA, Vol. I, pp. 443 et seq.




Alaska has an area of 580,107 square miles, and is therefore about one fifth the size of the United States, or nearly equal to the combined areas of the New England, Middle and Southern states east of the Mississippi River. With the interior of this vast area we are little acquainted. A number of reconnoissances have been made by officers

of the army, and by private travelers and prospectors, through portions of the territory, and the courses of several of its great navigable rivers have thus been determined.

The territory naturally falls into six great divisions, as follows. (Statistics are according to the United States census of 1890.)

1. The Arctic division, containing 125,245 square miles, and comprising all that portion which drains into the Arctic Ocean. There are 3,000 Eskimo and about 400 whites along the coast.

2. The valley of the Yukon River and its tributaries, so far as they lie within our boundaries. This division contains 176,715 square miles; is heavily timbered along the coast, and inhabited by an Eskimo and Indian population of about 5,000. Here they chiefly fish. Lately, gold has been found in considerable quantity along the Yukon Valley. The island of Saint Lawrence, in Bering Sea, is included.

3. The Kuskokwim division, containing 114,975 square miles, bounded on the north by the Yukon division, and comprising the valleys of the Kuskokwim, the Yogiak and the Nushagak rivers, and the intervening system of lakes. The Bering Sea washes its whole western and southern coast. This division, which also includes Nunivak Island, is mountainous, and has a population of about 6,000.

4. The Aleutian division, containing 14,610 square miles, and comprising the Alaska Peninsula westward of the isthmus between Moller and Zakharof bays and the whole chain of islands from the Shumagin group on the east to Attu on the west, including also the Pribilof or Fur Seal Islands, is populated by 3,000 Aleuts, who kill seals and fish.

5. The Kadiak division, containing 70,884 square miles, and comprising the south coast of the Alaska Peninsula down to Zakharof Bay, with adjacent islands, the Kadiak group of islands, the islands and coasts of Cook Inlet, the Kenai Peninsula and Prince William Sound, with the rivers running into them, is washed along its south shores by that section of the North Pacific named the Gulf of Alaska. This district contains mineral wealth, and is inhabited by several hundred whites. Total population, 4,500.

The southeastern division, in which Sitka, the capital, lies, contains 28,980 square miles, and comprises the coast from Mount St. Elias in the north to Portland Channel, in lat. 54° 40′ S., together with the islands of the Alexander Archipelago between Cross Sound and Cape Fox. The eastern boundary of this division is the rather indefinite line established by the Anglo-Russian and Russian-American treaties of 1824 and 1825 respectively, following the summits of a chain of mountains supposed to run parallel with the coast, at a distance not greater than ten marine leagues from the sea, between the head of Portland Channel and Mount St. Elias.

Following is the population of Alaska as per United States census of 1890, it being understood that the figures are not absolutely accurate.

| Districts. | Aggregate. | White. | Mixed. | Indian. | Mongolian. | All Others. |
|---|---|---|---|---|---|---|
| 1. Southeastern | 8,038 | 1,738 | 133 | 5,834 | 329 | 4 |
| 2. Kadiak | 6,112 | 1,105 | 784 | 2,782 | 1,433 | 8 |
| 3. Unalaska } Aleu- | 2,361 | 520 | 734 | 967 | 137 | 3 |
| 4. Nushagak } tian. | 2,726 | 318 | 28 | 1,996 | 384 | -- |
| 5. Kuskokwim | 5,681 | 24 | 17 | 5,640 | ---- | -- |
| 6. Yukon | 3,912 | 202 | 127 | 3,583 | ---- | -- |
| 7. Arctic- | 3,222 | 391 | ---- | 2,729 | 5 | 97 |
| The Territory | 32,052 | 4,298 | 1,823 | 23,531 | 2,288 | 112 |

Whites comprise 3,853 males and 445 females.
"Mixed" are descendants of Russians with native wives, and comprises 885 males and 934 females.
Indians comprise the Eskimo, Thlinket, Athabaskan, Aleut, Tsimpsean and Hyda tribes, aggregating 11,987 males and 11,287 females.
Mongolians (Chinese and Japanese) have no females.
"All others" have only one woman among them.

Natives. The Eskimo (or Innuit) inhabit the coast-line west of the 141st meridian, excepting the northern part of Cook Inlet, that portion of the Alaskan Peninsula west of the 157th meridian, and the Shumagin and Aleutian groups of islands. Recent investigators believe that their migration to Alaska occurred at the time of general tribal migration resulting in the settlement on Greenland. This opinion is strengthened by the fact that all the Eskimo tribes, whether on the Alaskan coast, the eastern coast, or in Greenland, use the same kind of skin-covered canoes, and are similar, also, in their modes of living.

The Aleuts inhabit the northern coast of the Alaskan Peninsula from Stroganof Point westward, and its southern coast from Pavlof Bay westward, the Shumagin Islands, and the whole group known as the Aleutian chain, extending from the Shumagins in the east to the island of Attu in the west. As to their origin, there are various opinions. Some believe they have a common origin with the people of Kamchatka; others, however, urge that they could not have migrated from Asia, owing to lack of facilities, and must have descended from the earliest nations of America.

They are divided into two tribes, Unalaskans and Atkhas, speaking different dialects. They wear ornaments in the nose and upper lip. Their weapons consist of barbed darts and lances, spears, harpoons and arrows. They also carry a sharp stone knife ten or twelve inches long. Their household utensils are made of stone, wood and bone; mats and baskets are neatly woven of grass and tree-roots; bone needles with thread and cord of sinews, etc. They are very hospitable, and fond of dancing and pantomimics.

All native villages on the Alaskan coast are built directly on the beach, not only because the Indians look to the sea for a living, but because making homes inland means such labor as felling trees and clearing the ground, which only the white race undertakes. In the genuine Alaskan lodge there is no window, one door only, and no second story. In the center of the floor, on the ground, is a fire-place, around which, at a distance of several feet, runs a continuous platform, which constitutes

the sleeping-apartments. Occasionally the room is divided by curtains. The ground beneath the platform constitutes kitchen and reception-room. The head of the house sits opposite the door, his family and friends on either side, while slaves, if there be any, sit with their backs to the door. In front of many of the houses stands one or more large poles, carved from top to bottom, generally representing bears, whales, eagles, ravens or wolves. These are the genealogical trees of the natives, of which they are very proud.

The Aleuts have a tradition that in olden times the climate of their country was clearer and warmer, the winds moderate; that their forefathers came from their original dwelling-place in the west,—a great land called Aliashka, or "continent"; that in that early country peace and prosperity prevailed; but that in the progress of time dissensions arose, resulting in war, separation and divergent emigration. They also say that in their old country there was a very great flood sent upon the people, because of their disregard of sacred customs.

They maintain that in former times the sea-shore along the whole group of islands was more deeply indented. In some localities this is even yet perceptible. The grandfathers of the present Aleuts in their youth heard from their grandfathers that they found on elevated spots, and often far distant from the sea, signs of former dwellings, such as whale-ribs and large logs of driftwood. Between these places and the shore-line they also found small pebbles tied with whale-bone fiber, such as are now used for sinkers, fish-lines and nets. From these indications the Aleuts came to the conclusion that at one time these elevated positions, showing the remains of dwelling-places, were on the sea-shore, and that over the places where the sinkers were found the sea once extended. All this was subsequent to the before-mentioned flood.

INDUSTRIES. Prior to 1885 the chief industry of Alaska was the seal-fur trade (see SEAL, Vol. XXI, p. 583). On account of the long-standing Bering Sea dispute between Great Britain and the United States (see BERING SEA QUESTION, in these Supplements), and consequent legal limitation placed upon the killing of seals, the annual published take has been greatly reduced. The reported value of seal-furs taken in 1889 was $314,925. In 1880 it had been $2,096,500. The majority of all seals taken, however, were taken illegally, and of these the census of 1890 takes no account. Regulations for the control of the seal-catch were recommended in August, 1893, by the Paris tribunal for arbitration of the Bering Sea question. These, adopted by the contending governments, have proved as ineffectual as their predecessors, and an estimate published in a recent United States navy report states that, during the last five months alone of 1894, 30,000 seals were killed in the Bering Sea, and of these 85 per cent were females, the loss of which is greatly to be deprecated, since it inevitably results in the death, by starvation upon the rookeries, or otherwise, of fully an equal number of pups. Unless the seals of Alaskan waters be promptly and adequately protected from such ruthless slaughter, their practical annihilation will be accomplished after a few more seasons. There is considerable traffic in other furs, and in fish, as well as an increasing production of minerals. Between 1867 and 1890 the value of furs taken in Alaska amounted to $49,000,000. The annual yield of sea-otter skins has reached 5,500, worth $500,000; beavers, 10,000, worth $25,000; silver foxes, 200, worth $20,000; martens, 20,000, worth $60,000; red and cross foxes, 10,000, worth $15,000; and other miscellaneous skins, valued at $25,000. Notwithstanding efforts made by the United States government for the preservation of these fur-bearing animals, the supply is continually decreasing, and will ultimately become extinct. The only important breeding-grounds of the fur-seals at present are the Pribilof Islands, lying in the heart of Bering Sea, about 200 miles westward of Cape Newenham on the mainland. Two of these islands, St. George and St. Paul, by reasons of their temperature, surface and facilities for landing, are specially adapted for the life and reproduction of these animals.

Sea-otters are most abundant from the island of Unimak northeasterly along the Alaskan Peninsula. The land-otter, whose skin is used in the manufacture of an imitation sealskin, is found on the whole coast, from the southern boundary to the northern shore of Norton Sound, and on most of the islands. The beaver, the brown bear, the mink, the cross, blue and white fox, the marten, and a few other valuable fur-bearing animals, are also found in great numbers in many parts.

The fisheries of Alaska are annually increasing in importance, and are destined to become its staple industry. The salmon industry is exceeded in importance only by the fur. The largest salmon-cannery in the world is at Karluk, in the southwestern part of Kadiak Island. The value of the yearly salmon product from 1884 to 1890 was $7,000,000. At Killisnu, on Kenesaw Island, in the southeastern district, there are important herring-fisheries, and from this point 150,000 gallons of herring-oil are shipped each year. Off the south coast, and in the Bering Sea, there are large codfish banks. The value of the fishery product (exclusive of seals) was $1,058,865 in 1889, against $564,640 in 1880.

The value of the mineral products of Alaska amounted in 1889 to $926,568; $4,000,000 in gold had been exported since the purchase of Alaska up to that time. In 1890 placer-mining in the Yukon region gave a $90,000 output, and since that time the yield has largely increased, the announcement of the discovery of valuable mines causing a large influx of miners in 1896.

The Klondike (see KLONDIKE, Vol. III, p. 1799) region, in which immense gold discoveries were reported in 1897, is in Canadian territory. Some of the routes to this and adjacent territory caused the traveler to pass through Alaskan territory,

while others ventured overland through the Canadian Northwest Territories. See also CANADA in these supplements.

PRINCIPAL TOWNS, GOVERNMENT, SCHOOLS, ETC. Sitka, the capital of the territory of Alaska, is in the southeastern district, and upon the west coast of Baranof Island. Steamboats run at least monthly between Sitka and Portland, Oregon. Population 1890, 1,190. Juneau, the largest town and most important trading-point in Alaska, is 80 miles northeastward from the capital. Its proximity to the mining districts, and convenient location with respect to the fur trade, destine it to remain the most important commercial point upon the coast. Population 1890, 1,253.

From the time of the military occupation of Alaska by the United States on October 9, 1867, until 1884, no territorial government was organized. In the latter year Congress created for Alaska a district government and court.

The court sits alternately at Sitka and at Fort Wrangel, which is on the mainland, and 125 miles east of the capital. The laws of Alaska are the same as those of the state of Oregon. The governorship, at present (1896) held by Hon. James Sheakley, is a four-year term of office.

There are, in Alaska, fourteen day schools and twenty-one mission schools, six of which are maintained by the Greco-Russian Church. They are largely attended by the Indians, who, though unsupported by the government, have settled in the vicinity of the larger towns, and willingly follow the example of their white neighbors. They are troublesome to white settlers only on account of the liquor and opium which is smuggled in to them.

BOUNDARY DISPUTE. The treaty signed by Great Britain and Russia in 1825, whereby the latter became owner of the territory now known as Alaska, specified that the boundary between this territory and British Columbia should commence at the southernmost point of Prince of Wales Island, continue northward along Portland Channel to 56° N. lat.; from there follow the summit of the mountains lying parallel to the coast up to the point of intersection with 141° W. long., and finally pass northward along this line into the Frozen Ocean. Further, it was provided that wherever the mountains mentioned as "lying parallel to the coast" should be more than ten marine leagues from the ocean, the boundary should be parallel to the coast-line, never exceeding the distance of ten marine leagues therefrom. From 1825 up to 1889 Russia, and after her the United States, occupied without challenge all territory west of Portland Channel. In the latter year Great Britain opened negotiations with the United States, which resulted, July, 1892, in the appointment of a commission to "delimit the existing boundary between the United States and her Majesty's possessions in North America, in respect to such portions of said boundary as may not have been permanently marked in virtue of treaties heretofore concluded." The British claim is, that in the treaty of 1825 Behm Channel, the first inlet west of Portland Channel, was meant as the boundary, since the latter, contrary to the statement in the treaty, does not extend to the line of 56° by five or six minutes of latitude, and therefore, starting from this point, the line should include within British domain territory 600 miles long, and varying in width up to 150 miles, now officially occupied by the United States. The disputed land is in the southeastern division of Alaska, and comprises 29,000 square miles. In it are valuable fisheries, and a gold-mine valued at $13,000,000.

See the various United States government publications; *Our Arctic Province* (Elliott, 1886); *Travels in Alaska and on the Yukon* (Whymper, 1868); *Alaska and Its Resources* (Dall, 1870, and Miner W. Bruce, 1895).

ALASSIO, a health and pleasure resort in northwestern Italy, on the Mediterranean. It is beautifully situated about midway between Genoa and Nice, with both of which it is connected by rail. It is a favorite English winter resort, and has considerable royal patronage. Population, 4,790.

ALATYR, a town of east-central Russia, lying in the province of Simbirsk. It is 75 miles W. of the Volga, and 125 miles N.E. of Penza, the nearest railway point of importance. Glass-making is its chief industry. Population, 8,085.

ALAUDIDÆ. See LARKS, Vol. XIV, p. 314.

ALAUX, JEAN, a French painter, and member of the Legion of Honor, was born at Bordeaux, Jan. 15, 1786; studied under Guérin and Vincent; was director of the French Academy at Rome from 1846 to 1853. In 1851 he became a member of the Institute; his best work is to be seen in the Museum of Versailles, both canvases and mural decorations; he died in Paris, March 2, 1864.

ALBA, a town of northwestern Italy, lying 32 miles from the Mediterranean, and 35 miles by rail S.E. of Turin. It is on the Tanaro River, and in the province of Piedmont. There is here a cathedral founded in 1486. Wine, silk, cheese and oil are produced, and several marble-quarries are in the vicinity. Population, 6,400.

ALBANENSES, a mediæval Italian sect which held to absolute dualism and believed the world to have been created by an evil spirit. They were closely connected with the Albigenses, and were named for Alba, a town in Piedmont.

ALBANI, ALESSANDRO, Italian cardinal; born at Urbino, Italy, in 1692. He was a nephew of Pope Clement XI, and was made a cardinal in 1721; was a liberal patron of the arts, and made a famous collection of statuary; died in 1779.

ALBANI, MADAME (*née* Emma Lajeunesse), vocalist, was born at Chambly, in Canada, in 1850. She was trained in music by her father, and at the age of 12 made her *début* at Albany; hence her professional name of "Albani." She afterward studied at Paris under Duprez, and at Milan under Lamperti. She sang at Messina in 1870 with a success that likewise attended her

at London and Paris, the United States, Berlin, etc. In 1878 she married Ernest Gye, son of the director of the Royal Italian Opera, London. Her greatest success was scored in Thomas's *Mignon*. She was a favorite in oratorios and concert songs.



MADAME ALBANI.

ALBANIAN LANGUAGE. See PHILOLOGY, Vol. XVIII, p. 784.

ALBANY OR ALBAINN, meaning a country of heights, is the name anciently given by the Celts to the whole of Britain, and later on to the northwest part, when they were driven there by foreign invaders. The title of Duke of Albany has occasionally been conferred upon younger sons of kings of Scotland and England, the custom having been inaugurated in June, 1398, when the brother of Robert III, then regent of Scotland, was given that title at Scone.

ALBANY, a division of the eastern part of Cape Colony, Africa, has an area of 1,685 square miles, and is 400 miles east of Cape Town; has two representatives in the house of assembly, and a population of 23,330, the majority of whom are blacks. The division lies in a rich cereal-producing region.

ALBANY, an important manufacturing town and railroad center of Georgia, capital of Dougherty, a southwestern county. It is delightfully situated at the head of high-water navigation on Flint River, 120 miles W. of Savannah, and is noted for the medicinal waters of its artesian wells. Population 1890, 4,008.

ALBANY, a post village in central Kentucky; capital of Clinton County. Albany Landing, on the Cumberland, is 10 miles north of it. Population, 375.

ALBANY, capital of Gentry County, in northwestern Missouri; 49 miles by rail N.E. of St. Joseph; is a manufacturing town of importance. Population 1880, 979; 1890, 1,334.

ALBANY, the oldest chartered city in the United States, capital of the state of New York, and county seat of Albany County, stands upon the west bank of the Hudson, 145 miles N. of the city of New York. At this point the Dutch settled in 1624, calling the village Beaverwyck, which name was changed in 1646 to Willemstadt, and in 1664 to Albany, in honor of the Duke of York and Albany (afterward James II of England), to whom the colony was granted on its cession to Great Britain. The principal public edifice is the state capitol, one of the most magnificent and costly structures of its kind in the world,—390 feet in length, 290 feet in width, 4 stories high, and built of drilled granite throughout, at a cost of more than $16,000,000. The new custom-house and post-office, the city hall, built of rough granite, and the Cathedral of the Immaculate Conception, are prominent public edifices. The city is handsomely built throughout, and contains more than 300 acres of handsome parks and boulevards. Albany manufactures annually about four million dollars' worth of stoves; its lumber



STATE CAPITOL AT ALBANY.

trade amounts to more than ten millions; and it is the center of the cattle trade for New York and New England from the West, its exceptional transportation facilities making it an important receiving and distributing point. Its numerous other industries include 20 breweries, 12 iron-foundries, 2 blast-furnaces, a cracker-bakery, and several extensive shoe-factories. An abundant supply of good water from an artificial lake, a beautiful park of 81 acres, and the excellence of its drainage—which is greatly facilitated by its hilly and irregular site—combine to make Albany, notwithstanding the severity of its winter climate, an exceptionally healthful and attractive city. Population 1880, 90,758; 1890, 94,923; 1892, 97,120. See ALBANY, Vol. I, p. 448.

ALBANY, a post village in Oregon, county seat of Linn County, on the Willamette River, in the west-central part of the state, about 27 miles S. of Salem; Portland is 65 miles N., and connected by rail. It contains a courthouse, seven churches, a collegiate institute, bank, and four newspapers. Population 1890, 3,079.

ALBANY, capital of Shackelford County, Texas, is 140 miles N.W. of Waco, with which it is connected by rail; Fort Worth is 130 miles E. of it. Population 1890, 857.

ALBANY, HÉLÈNE FREDRICA AUGUSTA, DUCHESS OF, a daughter of the Prince of the German principality Waldeck-Pyrmont. She was born Feb. 17, 1861, and is now the widow of the late Duke of Albany, whom she married in 1882. From the British government she receives a pension of six thousand pounds per annum. The Queen-Regent of Holland is her sister. The present Duke of Albany is the younger of her two children, the elder being a girl.

ALBANY, LEOPOLD GEORGE DUNCAN ALBERT, DUKE OF, the eighth child and youngest son of Queen Victoria, was born at Buckingham Palace, April 7, 1853. In 1881 the ancient and honorable

title of Duke of Albany, was conferred upon him, and the following year he married the Princess Hélène of Waldeck-Pyrmont. On the 27th of March, 1884, while ascending a stairway in a public amusement hall at Nice, he fell in a fit, and on the succeeding day died. The present Duke of Albany, his posthumous son, was born four months after the death of his father.

ALBANY REGENCY. See VAN BUREN, MARTIN, Vol. XXIV, p. 56.

ALBATI OR WHITE BRETHREN, a Christian sect of fanatical penitents who appeared in Italy early in the fifteenth century. The pope finally suppressed them. They wore only white clothing.

ALBEMARLE, the capital of Stanly County, North Carolina, is in the southwestern part of the state, and 27 miles by rail from Salisbury, which is N.W. of it. Population 1890, 248.

ALBEMARLE, a town of France. See AUMALE, Vol. III, p. 85.

ALBEMARLE SOUND, an inlet in the northeastern part of North Carolina, running inland for 60 miles, with a breadth of from 4 to 15 miles. It receives the waters of the Roanoke and Chowan Rivers, and is connected by canals with Chesapeake Bay and by natural channels with Pamlico Sound.

ALBERIC I. See ROME, Vol. XX, p. 787.

ALBERS, JOHANN FRIEDRICH HERMANN, German physician, born at Dorsten, Westphalia, Nov. 14, 1805; died at Bonn, May 12, 1867. He was professor of pathology at the university of Bonn, founded a celebrated asylum for the insane at that place, and wrote a *Manual of General Pathology* and a *Text-Book of General Pharmacy*.

ALBERT, a town of France, department of Somme, about 18 miles N.E. of Amiens, on the Railway du Nord. It contains cotton and woolen factories, saltpeter-works, paper-mills and foundries. It was formerly called Ancre. Population, 6,000.

ALBERT, King of Saxony, was born April 23, 1828, and succeeded to the throne, Oct. 29, 1873, having married, in 1853, Caroline, Princess Vasa, of Sweden. Before his accession he had considerable military experience, having taken part in the Danish war of 1848 and fought with the Austrians at the battle of Sadowa (1866). At the siege of Paris he held the right bank of the Seine, and at the conclusion of the war was made field-marshal and inspector-general of the German army. See also SAXONY, Vol. XXI, p. 351.

ALBERT VII OR ALBRECHT THE PIOUS, cardinal and archduke of Austria, third son of Maximilian II, was born Nov. 13, 1559, and died in July, 1621. His youth was spent at the Spanish court, where he was distinguished for his uprightness and his love for study. In his eighteenth year he was made cardinal, and, seven years after, he was made archbishop of Toledo. In 1594 he became viceroy of Portugal, which office he held for two years. The remainder of his life he was stadholder of the Netherlands, the representative of the Spanish monarch. In 1599 he abandoned his religious profession and married the Infanta Isabella.

ALBERT, EUGEN D', pianist; born in Glasgow, April 10, 1864; was a student of Liszt's, with whom, as a performer, he afterward was classed. He is the author of the opera *Ruby*.

ALBERT FREDERICK RUDOLPH, archduke of Austria, son of the late Archduke Charles, was born Aug. 3, 1817. In 1844 he married the Princess Henrietta of Nassau-Weilburg, who died in 1864, leaving two daughters. After the battle of Sadowa, he was made (July 13, 1866) commander-in-chief of the Austrian army. Before that time he had a long and various military experience, chiefly in campaigns in Italy. In 1869, he published *Ueber die Verantwortlichkeit im Kriege*.

ALBERT, PAUL, French literary historian; born at Thionville, Dec. 14, 1827; died at Paris, June 21, 1880. He held professorships at Poitiers and in the College of France, and published *History of Roman Literature*, and *French Literature from its Origin until the End of the Eighteenth Century*. His son, who edited his literary remains, has brought out two volumes of *French Literature in the Nineteenth Century*. The Academy honored his writings.

ALBERT EDWARD. See WALES, PRINCE OF, in these Supplements.

ALBERT EDWARD NYANZA, a lake of Eastern-central Africa, discovered by Baker in 1864, lying in lat. 1° S., long. 30° E. It has an elevation of 2,720 feet, and is one of the sources of the Nile. The waters of the Victoria Nyanza, 80 miles to the S.E., are delivered into it by the Kari River. It is 40 miles broad, and crescent-shaped. The explorer Stanley gave it its name in honor of the Prince of Wales.

ALBERTA, one of the four provisional districts into which the northwest territories of Canada were divided in 1882. It has an area of 106,500 square miles, and contains the great cattle-ranges of Canada. Large tracts of these grazing-lands are leased to ranching companies and individuals. Coal is abundant, timber is plentiful, and there are petroleum deposits. Calgary, the most important town, is situated on the Canadian Pacific railway, which passes through the south of the district. It is the center of the stock-raising industry, and has a population of 3,876. Total population of the district in 1891, 25,277.

ALBERT LEA, capital of Freeborn, a southern border county of Minnesota. The town is located on a small lake of the same name, and is the seat of Albert Lea College for Women; is 108 miles S. of Minneapolis, in the center of a fertile agricultural section, and contains flour-mills, grain-elevators and machine-shops; is the point of intersection of three railroads. It is picturesquely located and is a summer resort, being in a fertile and lake region. Population 1890, 3,305; 1892, 4,158.

ALBERTI, LEONE BATTISTA, born at Florence, Feb. 18, 1404; was a sculptor, painter, architect and organist. He was employed by the pope as an architect for church edifices, and to him credit

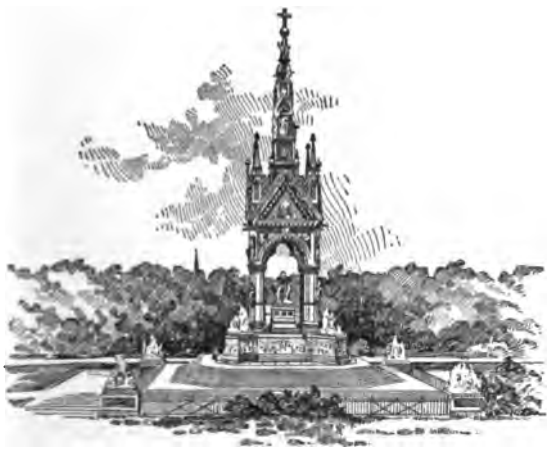
for the introduction of classical designs into Italy is due. His *De re Ædificatoria* is regarded a classic work on architecture. He died at Rome, in April, 1484.

ALBERTINELLI, MARIOTTO, a Florentine painter of the early part of the sixteenth century; born at Florence, Oct. 13, 1474; studied under Roselli and worked with Fra Bartolommeo. He painted *Virgin Mary with the Child*, now in the Louvre; *Virgin Mary with Saint Domenico*, at the Academy of Florence; and the *Visitation of Mary and Elizabeth*, also in Florence. Died in his native city, Nov. 15, 1515.

ALBERTITE, an asphaltic mineral, used, prior to the discovery of petroleum, in the manufacture of illuminating oils. Found in New Brunswick, where, in Albert County, veins of it were extensively worked earlier than 1865. See MINERALOGY, Vol. XVI, p. 428.

ALBERT MEDAL, a decoration instituted in 1866, in England, to reward heroic acts of mariners and others in saving life at sea. In 1867, in place of one decoration, two were instituted, called the Albert Medal of the First Class and the Albert Medal of the Second Class. In 1877 the Albert Medal was extended to acts of gallantry in preventing loss of life in mines, on railways, at fires and in other perils on land. Albert Medal is also the name of a distinction granted since 1864 by the English Society of Arts to notable men of science of many nationalities.

ALBERT MEMORIAL, a beautiful monument erected in Hyde Park, London, to the memory of



ALBERT MEMORIAL.

the Prince Consort Albert, who died in 1861. The monument was built from the designs of Mr. George Gilbert Scott, who was afterward knighted.

ALBERT RIVER. Two Australian rivers bear this name. One, in North Queensland, flows north for about 200 miles, and empties into the Gulf of Carpentaria, below Burktown; the other, in Victoria, flows south, and empties into the Pacific, near Port Albert.

ALBERTYPES. Joseph Albert, of Munich, in 1869, devised a successful process of reproducing photographs in printer's ink.

A sheet of plate glass is coated with a thin film of chromatized albumen and gelatin, laid face down on black velvet and exposed to the light. It is then washed and dried. The insoluble film adheres firmly to the glass, and serves as a foundation for the second film, which consists of chromatized gelatin. This is exposed under a negative which has been reversed by stripping. The plate is then soaked in water to remove the soluble bichromate, the film hardened with chrome alum, and then dried. The result is an almost invisible picture in gelatin which has become insoluble in water, and actually repellent for water; while the gelatin, which was protected by the negative (the whites), retains its absorbing power. Such pictures have been named albertypes, in honor of the inventor.

The plate is fastened by plaster of Paris to the bed of the press, and the printing is then conducted very much as in ordinary lithography. A wet sponge is applied to moisten the whites, and an ink-roller to ink the picture. A sheet of paper is placed on the surface, and on applying pressure the ink is transferred to the paper. The picture may also be printed on linen, silk, etc.

ALBIA, capital of Monroe County, southeastern Iowa; is 25 miles W. of Ottumwa, and 24 miles S.W. of Oskaloosa, with both of which it is connected by rail. Bituminous coal of a fairly good quality is mined in the vicinity. Population 1890, 2,359.

ALBION, capital of Cassia, a border county of south-central Idaho; is 11 miles S. of the Snake River and 55 miles S.E. of Shoshone. The Union Pacific railway passes 25 miles N. of it. Population 1890, 179.

ALBION, capital of Edwards County, southeastern Illinois; is 56 miles N.W. of Evansville, Indiana, on the New Albany and St. Louis railroad. Population 1880, 875; 1890, 937.

ALBION, capital of Noble County, northeastern Indiana; is 25 miles N.E. of Fort Wayne, and is on the Baltimore and Ohio railway; has six churches, two newspapers, and manufactories of sash, blinds, doors and agricultural machinery. Population 1880, 926; 1890, 1,229.

ALBION, a town of Calhoun County, southeastern Michigan, situated on the Kalamazoo River, 19 miles W. of Jackson and 96 miles W. of Detroit, being connected by rail with both. It is the center of a grain district, and contains several large flour-mills and manufactories of agricultural implements. It is also the seat of Albion (Methodist) College. Population 1880, 2,716; 1890, 3,763.

ALBION, capital of Boone County, east-central Nebraska; lies 112 miles N.W. of Omaha, with which it is connected by two lines of railway; contains a number of flouring-mills, and carries on a brisk trade in general merchandise. Population 1880, 330; 1890, 926.

ALBION, New York, capital of Orleans County, which borders on Lake Erie; is a post village 30 miles W. of Rochester, on the New York Central railway, and 52 miles N.E. of Buffalo, on the Erie canal. There are here flour-mills, iron manufac-

tories, and stone-quarries, and it is the center of a large fruit-growing district. This village is the seat of Phipps Union Seminary, the Albion Academy and a Roman Catholic college. Population 1880, 5,147; 1890, 5,773.

ALBION, a town in Dane County, south-central Wisconsin; is 20 miles S.E. of Madison and 14 N. of Janesville. Considerable tobacco is grown in the vicinity. There is an academy here, under the control of the Seventh-Day Baptists. Population 1890, 1,516.

ALBISTAN OR EL BOSTON, a town of central Asia Minor, lying at the foot of Mt. Towens and upon the Gihon River. There is a considerable trade in wheat at this point, which is in the center of a fertile region containing about 40 dependent villages. The forces of Egypt defeated the combined Turks and Mongolians here on the 16th of April, 1277. Population of the town, 8,500.

ALBONI, MARIETTA, a famous opera-singer, was born at Cesena, Italy, March 10, 1823, and died at Ville d'Avray, June 23, 1894. She possessed a rich contralto voice, said to have been the purest of her century. She early studied under Rossini, and at 15 made her *début* at Boulogne. She appeared in London, where she was considered a worthy rival of Jenny Lind. In 1850, she was enthusiastically received in the United States, where she became a great favorite. Her marriage to Count de Pepoli took place in 1854 and, upon his death in 1863 she permanently retired from public life. In 1877 she married again, her second husband being Mr. Lieger an officer of the French army. No contralto voice has had finer quality or more surprising compass than hers.



MADAME ALBONI.

AL BORAK, literally "the lightning," was the legendary fleet white mule on which Mohammed was supposed, by his disciples, to have made his journey from earth to the seventh heaven.

ALBRET, JEANNE D', a queen of Navarre; born at Pau, France, Jan. 7, 1528; died at Paris, June 9, 1572. Her parents were Henry II, king of Navarre, and Margaret Valois, sister of Francis I. In 1548 she married Antoine de Bourbon and became the mother of Henry IV of France. In 1567, being a firm Protestant, she declared Protestantism established in her domain and remained faithful to the Huguenots throughout her life. She was celebrated for her talents, her beauty and her heroic qualities.

ALBRIGHT, JACOB, founder of the evangelical association familiarly known as the German or Albright Methodists, was born near Pottstown, Pennsylvania, May 1, 1759, and died at Muehlbach (now Kleinfeltersville), Pennsylvania, May 18, 1808.

ALBUGO, a term employed in surgery to designate the white opacity that often follows ulceration of the cornea of the eye. If occurring in infancy it may diminish to some extent, but in after life it does not undergo absorption, nor admit of surgical relief.

ALBULA, a mountain pass 7,595 feet high, in the Swiss canton of the Grisons, connecting the valleys of the Albula and Hinter-Rhein with that of the Inn. It is three fourths of a mile long, granite and limestone peaks rising on either side.

ALBUMINOIDS OR PROTEIDS. See CHEMISTRY, Vol. V, p. 579.

ALBUMINURIA. See PATHOLOGY, Vol. XVIII, p. 387.

ALBUNOL, a town of Andalusia, Spain, province of Granada, southern Spain, near the coast of the Mediterranean; is 35 miles S.E. of Granada, which is the terminus of the nearest railway. Population, 9,372.

ALBUQUERQUE, a city in north-central New Mexico, capital of Bernalillo County, and at the intersection of two railways. The University of New Mexico, founded in 1892, is located here. It was founded in 1892, and is equipped and supported wholly by a territorial appropriation of $14,000 annually. The university is non-sectarian, co-educates the sexes, has 8 instructors and averages 100 students. The vice-president is Hiram Hadley, A.M. Santa Fé is 56 miles to the N.E. Population 1880, 2,315; 1890, 3,785.



UNIVERSITY OF NEW MEXICO.

ALBUQUERQUE, JERONYMO D', Portuguese soldier and explorer; born 1514; died at Olinda, Brazil, Feb. 26, 1594. He emigrated to Brazil in 1535, and there became a leader in many Indian wars; was captured by the Cahates tribe, gained them over to friendship for the whites, and married an Indian princess.

ALBUQUERQUE MARANHÃO, JERONYMO D', 1548–1618, a Brazilian soldier, son of the preceding; became a leader in expeditions against the Indians, and in 1599 explored and conquered the Rio Grande del Norte; retook Maranhão from the French, June 17, 1614, afterward becoming captain-general of that province.

ALBURNUM OR SAP-WOOD, is the lighter-colored, more recently formed part of the wood of dicotyledonous trees, which lies next to the bark. The older part (duramen) is denser, and often colored. The alburnum is the region of the "transpiration current;" that is, the current

which passes from the absorbing roots to the transpiring leaves, and is loosely referred to as the "ascent of the sap." The duramen is outside the circle of plant-activity, having become compact and hardened. It is, however, the more valuable for building and other purposes. The alburnum is of a pale color in all woods, even in ebony, in which the duramen or under layer is black.

ALCAÑIZ, a walled town of Aragon, Spain. It stands upon the right bank of the Guadalupe river, 12 miles below its junction with the Ebro. Saragossa is 56 miles N.W. of it, and the nearest railway point is 18 miles away in the same direction. There is a magnificent collegiate church here. Population, 7,800.

ALCATRAZ, an island in the bay, 3 miles N. of the city of San Francisco, California. There is a lighthouse upon the island, and a fortified post which commands the entrance of the Golden Gate and is used as a military prison.

ALCEDINIDÆ OR ALCEDIDÆ, a family of birds composed of the true kingfishers, which are remarkable for their fish-eating habits. The name *Halcyonidæ*, found in some works, is equivalent to the above. See KINGFISHER, Vol. XIV, pp. 81, 82.

ALCESTER, FREDERICK BEAUCHAMP PAGET SEYMOUR, BARON, son of Sir Horace Beauchamp Seymour, was born in London, April 12, 1821. Having studied at Eton, he entered the royal navy in 1834. Successive promotion finally brought him the rank of rear-admiral, which he attained in 1870. Six years later he became a vice-admiral and in 1882 was made an admiral. He was severely wounded during an engagement of the naval brigade in New Zealand in 1860. From 1870 to 1877 he was successively commander of the detached squadron, lord of the admiralty, and commander of the channel squadron. In the latter year he was made a K.C.B. His most distinguished services were rendered during 1882, when, as commander-in-chief of the Mediterranean fleet or squadron, he took a foremost part in the Egyptian operations. On the 11th of July, Arabi Pasha having refused to comply with his demand that the erection of defensive works before Alexandria should cease, he bombarded and utterly destroyed the forts at that point. In recognition of this service Parliament voted Admiral Seymour a reward of $100,000 and elevated him to the peerage, with the title of Baron Alcester of Alcester. He retired from the navy in April, 1886, and died on the 30th of March, 1895, at his home in London.

ALCIDÆ OR ALCADÆ, a group of birds which includes the auk, found in northern seas. See AUK, Vol. 3, p. 85.

ALCIDAMAS, a Greek rhetorician who flourished in Athens in the fifth century B.C. He was a pupil of Gorgias and a famous teacher of elocution. He was a native of Elæa, Asia Minor. *Against the Sophists* is the better known of his two extant orations.

ALCMÆON, a hero of Greek mythology who participated in the successful expedition of the Epigoni against Thebes. For having slain his mother, Eriphyle, he was pursued and driven to madness by the Furies.

ALCO, a small domesticated wild dog of Peru and Chile. Its very small head, and large, pendulous ears are its most striking characteristics.

ALCOCK, SIR RUTHERFORD, was born in London in 1809. He studied medicine there, at King's College, and served three years on the medical staff of the British auxiliaries in Portugal and Spain. In 1844 he was sent out as a British consul to China, in 1858 made consul-general in Japan, and the next year received the rank of minister plenipotentiary. He filled this post until 1865, from which time until 1871 he was envoy to the Chinese government. He was made a C.B. in 1860, a K.C.B. in 1862, a D.C.L. of Oxford in 1863, and president of the Royal Geographical Society in 1876. Among his works are *The Capital of the Tycoon;* and *Art and Art Industries in Japan.* He died Nov. 2, 1897.

ALCOHOLIC BEVERAGES are any liquids containing a proportion of alcohol and used as beverages by mankind. They are classified as follows: *Malt liquors*, beverages which are prepared by the fermentation of malted grain, and include beer, ale and porter. In malt liquors the percentage of alcohol varies from 1.5 to 9 per cent.—*Fermented liquors*, those which are prepared by the fermentation of the juices of fruit, and include wines properly so called, cider, and fruit wines prepared from other than grape juice. Wines restricted to the product of the grape contain 7.77 to 20.2 per cent of alcohol, and other fermented fruit beverages from 2 to 7 per cent.—*Distilled liquors*, prepared by the distillation of fermented saccharine liquid. To this class belong ardent spirits, such as brandies, rum, whisky, etc. The percentage of alcohol in ardent spirits considerably exceeds that in wine, varying in spirits from 45 to 55, and in liquors from 33.9 to 58.93 per cent.

ALCOHOLISM. See DRUNKENNESS, Vol. VII, p. 481.

ALCOHOLOMETRY is the process of estimating the percentage of absolute alcohol in a sample of spirits. The usual method, if only alcohol and water are contained, is to determine the specific gravity of the spirits. Adulterated spirits must be distilled before this test is made. Tables showing the percentage of alcohol corresponding to variations of gravity have been prepared on the basis of the specific gravity of absolute alcohol at 60° being .7938, and of water 1.

ALCORA, a Spanish trading-town in the province of Castellon, 42 miles N. of Valencia. A railroad skirting the Mediterranean coast is 13 miles to the east. It has a large export trade in fruit. Population, 3,827.

ALCORAN OR KORAN. See MOHAMMEDANISM, Vol. XVI, pp. 597–606; and for its theology, see Vol. XXIII, p. 242. Alcoran is also the name of a sort of steeple upon mosques and other oriental buildings.

ALCORN, JAMES LUSK, an American Senator, was born in Illinois, Nov. 4, 1816, and educated in Kentucky, where he was elected to the state legislature in 1843. He practiced law in Mississippi, and served in the legislature for about 20 years. At the close of the war, he was elected United States Senator, but was not allowed to sit. He was governor of Mississippi in 1869–71, and United States Senator in 1871–77; was the founder of the levee system of Mississippi, and of the State Agricultural and Mechanical College for colored youth, which bears his name. He died in Eagle Nest, Mississippi, Dec. 20, 1894.

ALCOTT, AMOS BRONSON, American educator and transcendental philosopher; born in Wolcott, Connecticut, Nov. 29, 1799. In 1823 he started an infant school in Wolcott, and in 1828 established another in Boston. He taught by conversation instead of by books, and his methods attracted considerable attention and criticism. Mr. Alcott finally gave up his school for the lecture platform. He visited Europe, and made many friends. On his return, he led the life of a peripatetic philosopher, conducting "conversations" on a wide range of practical questions. He published, after his seventieth birthday, *Tablets; Concord Days; Table Talk;* and *Sonnets and Canzonets.* He was one of the most prominent contributors to *The Dial.* Mr. Alcott was attacked with apoplexy, Oct. 24, 1882, and died at his home in Concord, Massachusetts, March 4, 1888.

ALCOTT, LOUISA MAY, American authoress, daughter of Amos Bronson Alcott, was born at Germantown, Pennsylvania, Nov. 29, 1832; was for some years a teacher, but began to write at an early age, and published her first book, *Flower Fables,* in 1855. Her life as a volunteer hospital nurse during the Civil War furnished material for her *Hospital Sketches* (1865), and supplied a background for several of her tales. She had written for the *Atlantic Monthly* and published several books before the appearance of her greatest success, *Little Women* (1868). She published a second part (1869), followed by *Little Men* (1871), with its sequel, *Jo's Boys* (1886). Among her numerous other works are *An Old-Fashioned Girl* (1869); *Under the Lilacs* (1878); and *An Old-Fashioned Thanksgiving* (1882). Few writers have been more popular with children than Miss Alcott, and her stories are valuable, as giving insight into the more wholesome side of child-life and child-ways in the United States. She died on March 6, 1888, only two days after the death of her father.



LOUISA MAY ALCOTT.

ALCOTT, WILLIAM ALEXANDER, American author, born in Wolcott, Connecticut, Aug. 6, 1798. He studied medicine at Yale, and practiced for several years before he associated himself with William Woodbridge in the preparation of school geographies and atlases. Mr. Alcott published *The House I Live in; The Young Man's Guide; The Young Housekeeper;* and many pamphlets on reform in education and moral and physical training. He died in Auburndale, Massachusetts, March 29, 1859.

ALCYONARIA, an order of the corals; q.v., Vol. VI, p. 384.

ALCYONIUM OR DEAD MEN'S FINGERS, a genus of cœlenterates belonging to the coral polyps (*Anthozoa*). The colonies of this polyp are often found as soft, branching masses incrusting foreign bodies. The red coral, sea-fans, and sea-pens belong to the same order. See CORALS, Vol. VI, pp. 384, 386.

ALDEGONDE, SAINTE. See HOLLAND, Vol. XII, pp. 92–93.

ALDEHYDES. See CHEMISTRY, Vol. V, p. 567.

ALDEN, EDMUND KIMBALL, a Congregational minister, was born at Randolph, Massachusetts, April 11, 1825. Since 1876 he has been the secretary of the American Board of Commissioners for Foreign Missions, in which capacity he has traveled and lectured extensively. He is an alumnus of Amherst College and of Andover Theological Seminary.

ALDEN, HENRY MILLS, an American author, and the editor of *Harper's Magazine,* was born at Mt. Tabor, Vermont, Nov. 11, 1836. In 1857 he was graduated from Williams College, and three years later from Andover Theological Seminary. He has been the principal editor of *Harper's Magazine* since 1869. His *Study of Death* is considered superior to his other writings.

ALDEN, JAMES, rear-admiral in the United States navy, was born in Portland, Maine, March 31, 1810. He died in San Francisco, California, Feb. 6, 1877. From 1838 to 1842 he accompanied, as a midshipman, the Wilkes expedition around the world, and during the war with Mexico he served as a lieutenant. At the outbreak of the Civil War, Alden was in command of the steamer *South Carolina,* and later commanded the sloop-of-war *Richmond* at the passage of Forts Jackson and St. Philip, and at the taking of New Orleans in April, 1862. Two years later he participated in the capture of Mobile Bay, being in command of the *Brooklyn.* He had become a captain in 1863. In 1866 he was promoted to be a commodore, and five years later he was made rear-admiral and placed in command of the European squadron.

ALDEN, JOHN, the youngest of the "Pilgrim Fathers," and said to have been the first to set foot upon Plymouth Rock when the *Mayflower* made land on Dec. 21, 1620. He was a cooper of Southampton, born in 1599. The year after the landing of the Pilgrims in New England he married Priscilla Mullens. He became, by his wisdom and uprightness, the chief officer of the colony. He died at Duxbury, Massachusetts, September, 1686. His courtship has been celebrated by the poet Longfellow, and is the subject of the fine statuette: *Speak for Yourself, John,* by the sculptor Rogers.

ALDEN, Joseph, an American educator; born in Cairo, New York, Jan. 4, 1807. He was graduated at Union College in 1829, became pastor of the Congregational Church at Williamstown, Massachusetts, then professor in Williams College, later president of Jefferson College, and from 1867 to 1872 president of the New York State Normal School at Albany. He was a prolific writer, and published more than seventy volumes, the best known of which are *The Example of Washington; The Science of Government; Citizen's Manual;* and *First Steps in Political Economy.* He died in New York City, Aug. 30, 1885.

ALDEN, William Livingston, American author, was born in Virginia on the 9th of October, 1837. From early youth he was an enthusiastic devotee of canoeing, and it was he who practically introduced this sport into the United States. After graduation from Washington and Jefferson College in 1858, he founded the Canoe Club of New York City and began to write stories for boys. He became the humorous editorial writer of the *New York Times*, and was one of the editors of *The Idler*. In 1885 Mr. Alden was appointed consul-general at Rome. After his service there, he removed to London, where he has since remained and been a frequent contributor to English magazines. His best-known stories for boys are *Toby Tyler; The Moral Pirates; Life of Columbus;* and *Cruise of the Canoe Club.*

ALDENHOVEN, an historic town in the Rhine province of southeastern Prussia. It is 13 miles N. of Aix-la-Chapelle, with which it is connected by rail. On the 1st of March, 1793, it was the scene of an important victory won by the Austrians over the French, but upon the 2d of October of the following year 85,000 French under Jourdan defeated upon the same ground 70,000 Austrians commanded by Clairfait. Population of the town, 1,200.

ALDINE EDITIONS. See Manutius, Vol. XV, pp. 512–514.

ALDRICH, Henry, born at Westminster, England, in 1647, and died at Oxford, Dec. 14, 1710. He was canon of Christ Church, Oxford, in 1682, and dean in 1689; was the designer of the Peckwater Quadrangle, and wrote *Hark, the Bonny Christ Church Bells.* But he is less remembered as an architect or a composer than as the author of the *Artis Logicæ Compendium* (1691), of which a new edition appeared in 1862, and which before 1826 was very largely used in English colleges. He was considered in his time one of the foremost defenders of Protestantism.

ALDRICH, Nelson Wilmarth, born in Foster, Rhode Island, Nov. 6, 1841; served in the state general assembly in 1875–76; in the latter year was speaker of the house of representatives, and was elected to Congress for 1878–80. In 1881 he was elected to the United States Senate as a Republican to succeed General Burnside, and was re-elected for 1887–99.

ALDRICH, Thomas Bailey, an American poet and novelist, was born at Portsmouth, New Hampshire, Nov. 11, 1836. While engaged in a New York counting-house he began to contribute verse to the newspapers, and soon after the publication of *The Bells* (1855), adopted journalism as a profession, and was editor of the *Atlantic Monthly* from 1881 until 1892. Among his novels are *Daisy's Necklace; Story of a Bad Boy; Marjory Daw; Prudence Palfrey; Queen of Sheba; Stillwater Tragedy.* In 1874 he published a selection of his poems under the title *Cloth of Gold, and other Poems*, and in 1881 his popular *XXXVI Lyrics and XII Sonnets.* Through his prose, Aldrich has taken a high place for descriptive power and gift of humor. His verse is noted for its metrical perfection and dainty thought. He is among the best composers of *vers de société.*



T. B. ALDRICH.

ALDRIDGE, Ira, American negro tragedian brought out by the actor Edmund Kean, and afterward known as the "African Roscius." Some biographers claim that he was born at Belair, near Baltimore, about 1810, while others say, probably on better authority, that he was born in New York City about 1805. They all agree that as a boy he had a passion for the stage, and that when he made his *début* in London at the Royalty Theatre as Othello he met with immediate success. He appeared in various countries, and everywhere was received with enthusiasm,—honors being conferred on him by nearly all the crowned heads of Europe. Aldridge was an honorary member of numerous academies of art. He died in Lodz, Poland, Aug. 7, 1867, leaving a widow, an English lady, in London.

ALECSANDRESCU, Grigorie, Rumanian poet, was born in 1812 at Tirgovesti in Wallachia, and died at Bucharest in 1886. His best-known work, *The Year 1840*, was written in a convent in which he was detained for political reasons. In 1859, while the Liberal party was in power, he was for a few months minister of finance. An edition of his collected poems and fables appeared in 1863.

ALECSANDRI, Vasilio. See Alexandri, in these Supplements.

ALECTORIDES, a so-called order of birds, considered by many authors as corresponding with the super-family *Gruioideæ.* The group is composed of the cranes, the rails, and allied forms.

ALECTOROMORPHÆ, a group of birds now restricted to the two sub-orders, *Alectoropodes*, containing the fowls proper, and the *Seristeropodes*, containing the curassows and mound-birds.

ALECTOROPODES, one of the two sub-orders of alectoromorphous birds, containing the pheasant, guinea-fowl, grouse, turkey, quail, partridge and all true fowls.

ALEDO, county seat of Mercer County, northwestern Illinois, 14 miles E. of the Mississippi River, on the Chicago, Burlington and Quincy

railway, and 22 miles S. of Rock Island. Coal-mines are found extensively in this region. Population 1880, 1,492; 1890, 1,601.

ALEMAN, MATEO, a Spanish novelist; born about the middle of the sixteenth century at Seville, and died in Mexico in 1610. For many years the finances of Philip II were in his care. He was author of several works, one of which, *Guzman de Alfarache*, published at Madrid in 1599, ran through 26 editions, consisting of not less than 50,000 copies, in six years. See SPAIN, Vol. XXII, p. 357.

ALENCAR, JOSÉ MARTINIANO D', the "Brazilian Cooper," wrote many romances of colonial and Indian life, and stories of Rio de Janeiro society. Of the former, *Iracema* and *O Guarany* may be taken as typical, and of the latter, *Senhora*, *Diva* and *Luciola*. He was born in Ceará, May 1, 1829, and died at Rio de Janeiro, Dec. 12, 1877.

ALESIA. See CÆSAR, Vol. IV, p. 637.

ALESIUS, ALEXANDER. Same as ALES, Vol. I, p. 478.

ALETSCH, the largest glacier in Europe, 12½ miles in length, sweeps round the southern side of the Jungfrau, and passes down the valley in a majestic curve. It has two tributary glaciers, the Upper and Middle Aletsch, which branch off to the northwest. At its eastern extremity there is a blue mountain lake, the Merjelen-See; and to the northwest lies the Aletschhorn, the second highest peak of the Bernese Alps.

ALEURONE. See BOTANY, Vol. IV, p. 88.

ALEUTS. See ALASKA, in these Supplements.

ALEWIFE, a North American sea-fish (*Clupea vernalis*). During the spawning-season (April and May) it is very abundant in the rivers of the Eastern coast. After spawning, it returns to the sea. It resembles the shad, but is not so valuable, economically.

ALEXANDER I (OBRENOVITCH), king of Servia, was born on Aug. 14, 1876, and succeeded his father, the ex-King Milan, who abdicated in favor of the son, March 6, 1889, after divorcing his consort, Queen Natalie. Until 1893 he governed through two regents, then, being in his seventeenth year, he took the royal authority into his own hands. When crown prince he accompanied his mother, Queen Natalie, into exile, after her separation from the king, but was forcibly removed from her at Berlin and conveyed back to Belgrade.

ALEXANDER II (ALEXANDER NICOLAEVICH ROMANOFF), emperor of Russia, was born April 29, 1818. He was carefully educated by his father, Nicholas, who professed himself delighted with the manifestations of "true Russian spirit" in his son. At 16 he was declared of age, made commandant of the Lancers of the Guard and first aide-de-camp of the emperor, and subjected daily to a life of maneuvering, reviewing and military parade, which at last seriously injured his health. He then traveled through Germany to recruit his energies, and while there in 1841 concluded a marriage with the Princess Marie (1824–80), daughter of the Grand Duke of Hesse. He now vigorously applied himself to his duties as chancellor of the University of Finland, and became popular with the Finns. On his accession to the throne, March 2, 1855, he found himself in a critical position. He had two parties to conciliate,—the old Muscovite party, zealous for the prosecution of the Crimean War, and the more peaceable portion of the nation, sympathizing with the latter. By temporizing he was enabled to conclude a peace. Throughout his reign he had to hold the balance between conservatives and extreme radicals, but succeeded in promoting reform. The grand achievement of his reign, which was in great measure his own deed, was the emancipation of the 23,000,000 serfs in 1861. Reforms of the tribunals of civil and criminal procedure and of municipal institutions followed, the years 1861–67 being considered the most progressive in Russian history. In 1865 Alexander established elective representative assemblies in the provinces. He resisted strenuously all foreign interference with Polish affairs during the insurrection of 1863, which was severely suppressed. During his reign the Russian empire was widely extended in the Caucasus and in central Asia. The capture of Schamyl, the famous Lesghian chief, in 1859, closed the long struggle with the tribes of that country. In 1864 Russia began a decided advance against the khanates of central Asia, and in a few years reduced them to partial subjection. During the Franco-German war of 1870–71, Alexander maintained a sympathetic attitude toward Germany; a policy which was continued and extended in subsequent alliances, both with that country and Austria. The czar shared the national sympathy with the Slavic races under Turkish rule, and took the field during the war between Russia and Turkey in 1877–78. The most remarkable feature of the second half of his reign was the struggle of the Russian autocracy with the revolutionary party called Nihilists. Like his grandfather, Alexander I, he was a liberal and humane monarch, but could not keep pace with the more forward portions of his subjects, hence the reactionary tendency of many of his later measures. His government repressed the revolutionists severely, and they sought vengeance by attacking the persons of the czar and of his officers. Repeated attempts were made to assassinate Alexander. In 1879 he was shot at in his capital; in the same year the train in which he was supposed to be traveling was blown up by an elaborate mine beneath the railway; in 1880 a destructive explosion was effected by dynamite placed beneath the imperial apartments in the Winter Palace at St. Petersburg. On March 13, 1881, he was injured by a bomb thrown at him while riding in a sleigh near his palace, and died within two hours afterward.

ALEXANDER III, late emperor of Russia, succeeded to the throne on the murder of his father by Nihilist conspirators on March 13, 1881. He was born on March 10, 1845. For some time after his elevation he lived in close retirement at Gatschina, being in dread of Nihilists. His corona-

tion took place at Moscow, May 27, 1883. He had married, in 1866, Mary Fèodorovna (formerly Mary Sophia Frederica Dagmar), daughter of Christian IX, King of Denmark, and sister of the Princess of Wales and the King of Greece. He strenuously opposed the ultra-conservative policy which his father followed in his later years, and in 1879 came into open rupture with him. The czar suppressed Nihilism, developed the military power of Russia, organized her Asiatic and Caucasian provinces, and kept constant watch over India and Constantinople.



ALEXANDER III.

The reign of Alexander III was comparatively uneventful. In November, 1887, he made a public entrance into Berlin on the occasion of a visit to Emperor William I. In 1892 he had a meeting with William II. During his reign the *Dreikaiserbund* (Austria, Germany and Russia) was perfected. He was known to be truly devoted to peace, and only his strong purpose held Russia back from war in more than one international contention. He also devoted himself to the reform of state abuses and the extension of popular rights, though during 1892 he was guilty of directing a harsh edict against his Jewish subjects. In his personal and domestic relations the czar was a high-minded gentleman. Attempts to take his life were made in 1887 by the Nihilist societies, and in October, 1888, he and his family narrowly escaped death in an accident upon the Transcaspian railway. His death took place at Livadia, in the Crimea, Nov. 1, 1894, his eldest son becoming czar as Nicholas II.

ALEXANDER, ARCHIBALD, was born near Lexington, Virginia, April 17, 1772; died at Princeton, New Jersey, Oct. 22, 1851. He became a Presbyterian minister; was president of Hampton-Sidney college from 1796 to 1807, and in 1812 was elected the first professor of Princeton Theological Seminary, which had just been founded. He wrote extensively for the *Princeton Review*, and published theological treatises.

ALEXANDER, EDMUND BROOKE, American soldier, was born in Haymarket, Virginia, Oct. 2, 1802; died at Washington, District of Columbia, Jan. 3, 1888. After graduation from the United States Military Academy in 1823, and twenty years' service at the frontier, he won, in the Mexican War, major's and lieutenant-colonel's brevets. During the Civil War he was posted at St. Louis as provost-marshal and superintendent of the volunteer recruiting service; was made brevet brigadier-general March 13, 1865, and commanded his regiment at Fort Snelling until his retirement in 1869.

ALEXANDER, GEORGE, a Presbyterian clergyman, born at West Charlton, New York, Oct. 12, 1843. After graduating from Union College and Princeton Theological Seminary, he was ordained in 1870 pastor of a Presbyterian church at Schenectady, New York, where he remained until 1883, acting, during the last six years of that pastorate, as professor of logic at his *alma mater*. Since 1884 he has been pastor of the University Place Presbyterian Church, New York City, and has conducted extensive missionary-work in the tenement-house districts of that city.

ALEXANDER, GEORGE, an English actor, was born at Reading in June, 1858, and, after some years' stage experience in the country, was brought to London by Sir Henry Irving, and appeared at the Lyceum in *The Two Roses;* toured in America with Mr. Irving in 1884–85. In 1890 he undertook the management of St. James Theatre, London, where he has had much success.

ALEXANDER, JAMES WADDELL, Presbyterian minister, son of Archibald Alexander (q.v.), was born March 13, 1804, at Gordonsville, Virginia. In 1820 he graduated from Princeton College, and later from the theological seminary at the same place. After holding various pastorates in Virginia and New Jersey, he returned to Princeton in 1853 as professor of rhetoric. From 1851 until his death he was pastor of the Fifth Avenue Presbyterian Church, New York City; published *Discourses on Christian Faith and Practice; Sacramental Discourses;* and many others of a similar nature, besides being an extensive contributor to the *Princeton Review*. He died at Red Sweet Springs, Virginia, July 31, 1859.

ALEXANDER, JOHN HENRY, mathematician and physicist; born at Annapolis, Maryland, June 26, 1812; died in Baltimore, March 2, 1867. He was professor of physics at the University of Pennsylvania and at the University of Maryland; published *History of the Metallurgy of Iron; Universal Dictionary of Weights and Measures;* and other works.

ALEXANDER, STEPHEN, astronomer, born in Schenectady, New York, Sept. 1, 1806; died at Princeton, New Jersey, June 25, 1883. From 1845 to 1878 he occupied in turn the professorships of mathematics and of astronomy and mechanics at Princeton. In 1860 he conducted an expedition to Labrador for the purpose of observing a solar eclipse. He has published *Physical Phenomena Attendant Upon Solar Eclipses; Fundamental Principles of Mathematics;* and numerous papers.

ALEXANDER, WILLIAM, called "Lord Stirling," soldier, born in New York City, in 1726; died in Albany, New York, Jan. 15, 1783. In 1757 he prosecuted his claim to the earldom of Stirling before the British House of Lords, but without success. Soon afterward he became surveyor-general and member of the provincial council. At the beginning of the Revolution he assumed the cause of the patriots, and as colonel of the battalion of East Jersey captured an armed British transport, for which exploit Congress, in March, 1776, appointed him brigadier-general. At the battle of Long Island, Aug. 26, 1776, his brigade was nearly destroyed, and he himself taken prisoner. Within the same year he was exchanged,

and in February, 1777, was made a major-general. When General Charles Lee marched to Philadelphia in December, 1776, Alexander remained in command at New York. At Trenton, New Jersey, he captured a Hessian regiment. On June 24, 1777, at Metuchen, his division was defeated, and he lost two guns and 150 men. He fought creditably at Brandywine, Germantown, and Monmouth. He was one of the founders of King's College (now Columbia), and became its first governor.

ALEXANDER, WILLIAM, an Irish bishop; born at Londonderry, April 13, 1824. He was educated at Oxford; was made bishop of Derry and Raphoe in 1867; has lectured extensively, appearing in America at Columbia College in 1892; has published *The Divinity of Our Lord; Leading Ideas of the Gospels;* and several volumes of poems, sermons and biblical commentaries.

ALEXANDER, WILLIAM LINDSAY, scholar, and divine of the Scottish Congregational Church, was born at Leith, Aug. 24, 1808, and died at Pinkieburn, near Edinburgh, Dec. 22, 1884; published *Christian Thought and Work; Connection and Harmony of Old and New Testament; Zechariah;* and other doctrinal works.

ALEXANDER ÆTOLUS, scholar and poet of the Alexandrian period. Fragments of his elegiac verse remain, and are contained in *Poetæ Lyrici* of Bergk.

ALEXANDER JOHN I, first prince of Rumania, was born March 20, 1820, and died in retirement at Heidelberg, May 15, 1873. In 1859 he was elected first prince of Moldavia and prince of Wallachia. On Dec. 23, 1861, he was recognized by Turkey, and the union of the two principalities, under the name of Rumania, was proclaimed; on the 23d of February, 1866, a revolution compelled his resignation, and from that date until close upon his death he lived in retirement at Vienna.

ALEXANDER KARAGEORGEVICH, prince of Servia, born at Topolya, Oct. 11, 1806. He was the son of Tsrni George, the first prince of Servia, who was murdered in 1817 by the agents of Prince Michael's father, who had then obtained the ascendency in Servian affairs. Michael was forced to abdicate in 1842, and Alexander, who previously had been in practical exile, was elected by the Serbs to succeed him. He was in power for 17 years, pursued a peace policy, and increased the internal improvements of his state. Finally, however, he became obnoxious to the people and was deposed Dec. 11, 1858. In 1868 he was sentenced by the Austrian authorities to eight years' imprisonment on account of his complicity in the murder of Prince Michael. He died at Temesvar, in Hungary, May 2, 1885.

ALEXANDER NEVSKI OR NEVSKOI, Russian prince, born in Valdimir in 1219 and died at Gorodetz, Nov. 14, 1263. He was the son of the Grand Duke Yaroslef II, whom he succeeded in 1246; took his surname from the River Neva, on which he won a remarkable victory over the Swedes in 1240. He has come to be regarded a hero-saint by the Russians, and in 1712 Peter the Great founded and named after him a great monastery which stands at St. Petersburg, marking the spot where the duke gained his most famous victory.

ALEXANDER JOSEPH OF BATTENBERG, prince of Battenberg and ex-prince of Bulgaria. His father, Prince Alexander of Battenberg (Hesse), was the brother of the late empress of Russia. On April 29, 1879, he was elected hereditary prince of Bulgaria by the assembly of notables, having previously served with distinction in the war with Turkey. In 1885, King Milan of Servia having declared war against Bulgaria, he led his army to victory over the larger and more experienced one of Servia. The peace treaty was signed at Bucharest in the same year. In the following year, Russian machinations causing the revolt of part of his army, he abdicated, to be soon returned into power, greeted by popular favor, but finally, on account of the antagonism of Russia, to retire permanently to his estate at Gratz, in Styria, western Austria, where he died, Nov. 17, 1893.

ALEXANDERS (*Smyrnium Olusatrum*), a biennial plant of the family *Umbelliferæ*. It is found in waste ground and near ruins in Britain and the south of Europe. It was among the most common of cultivated umbelliferous plants in ancient times, and probably used in the same way as celery. The name *Golden Alexanders* is also applied to certain species of the North American genera *Thaspium* and *Zizia*.

ALEXANDRA CAROLINE MARIE CHARLOTTE LOUISE JULIE, PRINCESS OF WALES, was born Dec. 1, 1844, and married to Albert Edward, Prince of Wales, March 10, 1863. She is the eldest daughter of Christian IX, King of Denmark, and sister of the widow of Alexander III of Russia and the King of Greece.



ALEXANDRA, PRINCESS OF WALES.

ALEXANDRI OR ALECSANDRI, VASILE, a Rumanian poet and patriot, born at Jassy in 1821. He was educated at Paris, and after his return to Jassy in 1839 devoted himself to the cause of Rumanian independence and unity. He was minister of foreign affairs under Ghika in 1859–60; died at Mircesti, in Moldavia, Sept. 4, 1890. Many of his writings, the most important of which is a collection of popular songs entitled *Poesii Populare ale Românilor*, have been translated into French, English and German.

ALEXANDRIA, a manufacturing town in the county of Glengarry, eastern Ontario, Canada, is 70 miles by rail E. of Ottawa. Population 1881, 1,200; 1891, 1,614.

ALEXANDRIA, the capital of Rapides Parish, northwestern Louisiana, is on the Red River,

about 200 miles from its mouth, and 360 miles N.W. of New Orleans. Baton Rouge is 97 miles by rail S.E. of it. It carries on trade by water at all seasons, exporting mainly fruits, sugar, cotton and rice. Population 1880, 1,800; 1890, 2,861.

ALEXANDRIA, the capital of Douglas County, west-central Minnesota, is 62 miles by rail W. of St. Cloud and 140 miles N.W. of St. Paul. Population 1880, 1,355; 1890, 2,118.

ALEXANDRIA, the capital of Hanson County, southeastern South Dakota, is 14 miles by rail E. of Mitchell and 105 miles N.W. of Sioux City. Population 1895, 614.

ALEXANDRIA BAY, a village of Jefferson County, north-central New York, is near the St. Lawrence and opposite the Thousand Islands; is much frequented as a summer resort. Redwood, the nearest railway point, is 7 miles S.E. of it. Population 1880, 587; 1890, 1,123.

ALEXANDRIAN CODEX. See ALEXANDRIAN MS., Vol. I, p. 496.

ALEXANDRIAN LIBRARY. See LIBRARIES, Vol. XIV, p. 510.

ALEXANDRIAN PERIOD. See CHRONOLOGY, Vol. V, p. 714.

ALEXANDRITE. See MINERALOGY, Vol. XVI, p. 386.

ALEXANDROPOL. See GUMRI, Vol. XI, p. 277.

ALEXANDROV, a town in the Russian government of Vladimir, 55 miles by rail N.E. of Moscow. It has dye-works, and muskets and iron-ware are manufactured. Population, 5,810.

ALEXANDROVSK, a fortified town on the Dnieper, in south-central Russia, in the government of Yekaterinoslav; is connected by rail with Moscow. Population, 4,300.

ALEXINATZ, a town in Servia, on the Morava River. It is 100 miles S.E. of Belgrade. It fell into the hands of the Turks in 1876, and suffered severely after the battle which the Russians lost there at that time. Near the town, a memorial monument has been erected in honor of the Russians who fell in that battle. Tobacco is the principal export. Population, 6,000.

ALEXIS ALEXANDROVICH, grand duke of Russia, was born on the 14th of January, 1850, in St. Petersburg. He is a younger son of the emperor Alexander II, and in 1872 he traveled extensively in America.

ALEXISBAD, a health-resort in Anhalt, central Germany. It is situated within two miles of the town of Harzgerode, which is of great historical interest. Its baths and mineral springs are among the best known in Germany.

ALFALFA, a thickly growing grass, valued for forage; same as lucerne; q.v., under AGRICULTURE, Vol. I, p. 378; see FORAGE PLANTS, in these Supplements.

ALFONSO XII, king of Spain, the son of Isabella II, was born on the 28th of November, 1857, and when 11 years old went into exile with his mother. On Jan. 15, 1875, he became the king of Spain. Three years afterward, he married Mercedes d'Orleans, his cousin, who died within a year after the marriage. He wedded the Archduchess Maria Christina of Austria in 1879. His death occurred Nov. 25, 1885, and his only daughter, Mercedes, was styled queen, under the regency of her mother. On the 17th of May, however, of the following year, a posthumous son, Alfonso XIII, was born.

ALFORD, a village of Aberdeenshire, Scotland. It was here that Montrose defeated the Covenanters under Baillie, July 2, 1645.

ALFORD, CHARLES RICHARD, Anglican missionary and divine, ex-bishop of Victoria, Hongkong, was born in Somersetshire, England, in 1816, and now resides at Tunbridge Wells, Kent; was educated at St. Paul's School and Trinity College, Cambridge; held various pastorates, and was consecrated bishop of Victoria, Feb. 2, 1867, but resigned the see in 1872. He has published *First Principles of the Oracles of God*, and many sermons and pamphlets.

ALFRED, capital of York County, southwestern Maine; is 25 miles by rail S.E. of Portland. The township includes a Shaker village. Population 1880, 1,101; 1890, 1,030.

ALFRED ERNEST ALBERT, Duke of Saxe-Coburg-Gotha and of Edinburgh, second son of Queen Victoria of England, was born at Windsor Castle, Aug. 6, 1844; in 1858 he entered the royal navy, and on Jan. 23, 1872, married the Grand Duchess Marie of Russia, daughter of Alexander II. They have had five children. See EDINBURGH, in these Supplements.

ALFRED CENTER, an inland village in Allegany County, southwestern New York; is two miles from Alfred station, on the Erie railroad. Alfred University, a non-sectarian institution having 125 students, is located here. Population 1890, 786.

ALFRETON, a market town of Derbyshire, England, on the Midland railroad, has manufactures of hats, stockings and brown earthenware. There are collieries and iron-works in the vicinity. Population, 4,626.

ALGÆ, the name applied to what are generally called "seaweed," though they are also abundant in fresh waters. They are distinguished from other thallophytes by containing chlorophyl (plant-green) and are therefore not dependent upon other organisms for food-supply. They occur in a vast variety of forms and sizes, from microscopic forms to the giant "kelp" of the Pacific Coast, which attains a length of from 1,000 to 1,500 feet. Great floating masses of the genus *Sargassum* give rise to the name *Sargasso Sea*. The fresh-water forms are commonly green, while the marine forms are more usually various shades of brown, yellow, red and purple. The ordinary grouping of algæ is as follows: (1) Blue-green algæ (*Cyanophyceæ*); (2) Green algæ (*Chlorophyceæ*); (3) Brown algæ (*Phæophyceæ*); and (4) Red algæ (*Rhodophyceæ*). In the lowest members reproduction is entirely by cell-division, but sex-reproduction soon appears, and then the differentiation of sexes into dissimilar *gametes* (reproductive cells) is produced in dissimilar sex organs

(*oögonia* and *antheridia*). The whole plant-fabric is what is styled "cellular,"—that is, composed of thin-walled cells,—and seldom shows any differentiation of such vegetative organs as root, stem, and leaf (a common distinction of thallophytes), although stem and leaf structures are freely developed in certain forms. From an evolutionary point of view, the algæ are of great importance, as representing those thallophytes from which the higher groups have developed. From an economic point of view they are of small importance, although among them are found such edible forms as Irish moss, dulse, etc., and from others are obtained iodine, bromine, soda, etc., while many are valuable as fertilizers.

ALGAROVILLA, an astringent substance procured from the seeds and husks of a number of leguminous plants found in South America; is much used in dyeing, and is a very powerful agent in the tanning of leather. Also written ALGARROBILLA.

ALGER, HORATIO, JR., author and Unitarian minister, was born in Massachusetts, Jan. 13, 1834; graduated at Harvard in 1852, and in 1864 became pastor of a Unitarian church in Brewster, Mass.; moved to N. Y., 1866; wrote boys' books, *i.e.*, *Paul Preston's Charge; Do and Dare;* has also published lives of Webster, Lincoln and Garfield.

ALGER, RUSSELL ALEXANDER, lawyer and politician; born in Lafayette, Ohio, Feb. 27, 1836; admitted to the bar in 1859. He was captain in the Second Michigan cavalry, in 1861, and came out as brevet major-general, having distinguished himself at Gettysburg and in the Shenandoah Valley. After the war he was engaged in the lumber business in Detroit, and amassed a large fortune. In 1884 he was elected on the Republican ticket as governor of Michigan, and served for two years; was a candidate for the Presidential nomination at the Republican convention of 1888. In 1890 he was made commander-in-chief of the Grand Army of the Republic, and in 1897 appointed Secretary of War.

ALGER, WILLIAM ROUNSEVILLE, American clergyman and author, was born in Freetown, Massachusetts, Dec. 30, 1822. He studied for the ministry, and became pastor of a Unitarian church in Roxbury, Massachusetts, in 1852; later he accepted pastorates at Boston, New York, Denver, Chicago and Portland; has written *A Critical History of the Doctrine of a Future Life; Genius of Solitude; Friendships of Women;* and other works of a similar nature.

ALGERIA. The historic record given in Vol. I, pp. 562–569, brings the progress of Algeria down to 1871. When the Franco-Prussian war of 1870 compelled the emperor of France to withdraw his troops from Africa, the natives of Algeria entertained hopes of freeing themselves from the yoke of France. The insurrection which broke out in the provinces of Constantine and Oran was checked by General Durieu with great difficulty. After the fall of the empire, the republican government at Paris gratified the wishes of the Algerians by withdrawing from them the military government and appointing a civil governor-general. General Chanzy was accused of governing the country despotically, and he was replaced by Albert Grévy in 1878. When France entered on a campaign against Tunis in 1881, an Arab chief (Bou Ameema) raised the standard of revolt in Algeria, and inflicted considerable losses on the French colonists, but was defeated at the end of about three months. Governor Grévy resigned three months later. The insurgents did not submit entirely until June, 1883. A civil governor-general has since administered the government of Algeria, which is regarded as a detached part of France, rather than as a colony. A small extent of territory in the Sahara is administered by the military authorities, represented by the commandant of the nineteenth army corps.

The French Chambers alone have the right of legislating for Algeria, while such matters as do not come within the legislative power are regulated by decree of the president of the republic. The governor-general is assisted by a council, whose function is purely consultative. A superior council, meeting once a year, to which delegates are sent by each of the provincial general councils, is charged with the duty of discussing and voting the colonial budget. Each department sends one senator and two deputies to the national assembly.

The boundaries of Algeria are not well defined, large portions of the territory in the outlying districts being claimed both by the French government and the nomad tribes who inhabit it and hold themselves unconquered. The colony is divided officially into three departments, consisting, as a whole, of the "Territoire civil," and a "Territoire de commandement." The following table gives the area of each of the three departments according to the census of 1891:

| DEPARTMENTS | Area. Square Miles. | POPULATION. | | |
|---|---|---|---|---|
| | | Civil. | Military. | Total. |
| Algiers | 65,929 | 1,275,650 | 192,477 | 1,468,127 |
| Oran | 44,616 | 817,450 | 124,616 | 942,066 |
| Constantine. | 73,929 | 1,543,867 | 170,672 | 1,714,539 |
| | 184,474 | 3,636,967 | 487,765 | 4,124,732 |

To this must be added what is designated the Algerian Sahara, of indefinite extent, but estimated at 350,000 square kilometers, or 135,000 square miles, and with a population vaguely estimated at 50,000. The civil territory is constantly increasing in area by taking in sections of the military territory. Of the population in 1886, 2,014,013 were males, and 1,791,671 females. The marriages among whites were 3,543, the births 15,618, and deaths 13,123,—showing an excess of 2,495 births over deaths. In 1891, of the total population there were 272,662 of French origin or naturalization, 47,667 naturalized Jews, 3,567,223 French indigenous subjects, 4,344 Tunisians,

18,194 Moroccans, and 217,386 foreigners,—Spaniards, Italians, Anglo-Maltese, Germans.

The population in 1891 of Algiers was 82,585; Oran, 74,510; Constantine, 46,581; Bône, 30,806; Tlemçen, 29,544; Ghardaja, 28,782; Blidah, 23,686; Tizi-Ouzou, 26,007. The receipts of the government are derived chiefly from indirect taxes, licenses, and customs duties on imports. The natives pay only direct taxes. The cost of maintenance of the army is not included in the budget. A proportion of the sums spent on public works is also paid by the state. The budget for 1896 estimated an expenditure of 74,010,620 francs, and a revenue of 53,015,019 francs. According to a special return, during the period from 1830 to 1888 the total expenditure in Algeria was 5,018,066,462 francs; the total receipts for the same period being only 1,256,041,004 francs, —showing an excess of expenditure of 3,762,025,458 francs, or over $753,000,000, being for military services. The total expenditure on "colonization" is given as 144,205,504 francs.

About three and a quarter millions of the inhabitants are engaged in agriculture, nearly two hundred thousand thereof being Europeans. The annual crop of wheat is given as five and a quarter million metric quintals (nearly six billion pounds); barley, seven and a quarter million quintals; vines, over three and one half million hectoliters; tobacco, nearly four millions. The total area cultivated is 4,273,362 hectares. In 1891 the vineyards covered 150,000 hectares, and the animal stock, in the same year, was about seventeen millions. Nearly three thousand persons are employed in mines; the annual production of iron ore being 352,000 tons, worth 2,457,190 francs, and that of other metals (blende, galena, copper, silver) 22,500 tons, the value being 1,426,475 francs.

The greatest portion of the commerce of Algeria is from France, from which it imports flour, animals, cotton, leather and metal goods, etc., of the annual value of 215,000,000 francs, and to which it exports cereals, wines, animals, wool, etc., to the value of 207,000,000 francs. Its greatest exports (next to France) are to Great Britain and Ireland, value of 14,000,000 francs; Belgium, 4,000,000; Spain, 2,400,000; Tunis, 2,280,000; Russia, Italy, Austria and the United States of America, about 1,500,000 francs (or $300,000) each. The chief imports (outside of France) are from Morocco, worth nearly 11,000,000 francs; Tunis, 11,300,000; Great Britain, 4,442,000; Spain, 4,700,000; Austria, 1,000,000; Italy and the United States, worth a little over 1,000,000 francs each. The annual imports from Turkey average 250,000 francs, and the exports thereto scarcely 22,000 francs.

About 3,600 vessels, of 2,165,000 tons, enter Algerian ports from abroad, and 3,400, of 2,100,000 tons, clear annually. There is also a large coasting-trade. In 1893 the mercantile marine of Algeria consisted of 626 vessels, of 9,504 tons, mostly coasters, besides numerous small fishing-vessels. In the same year there were 1,956 English miles of railroad in operation in Algeria, including a Tunisian extension of 140 miles. The total receipts for the previous year were 21,908,225 francs, or $4,381,645.

The telegraph lines of Algeria measure 4,310 miles, comprising 10,000 miles of wire, with 356 offices. In the savings banks of the country there are about 17,000 depositors, whose deposits aggregate 4,866,000 francs, averaging 286 francs ($57.20) each.

ALGIERS, a suburb of New Orleans, Louisiana, was laid out as a village in 1815, but dates its growth from the building of the dry-docks in 1846. In 1852 it was incorporated as a city, and grew rapidly until the commencement of the Civil War, during which it suffered severely. It was made a ward of the city of New Orleans in 1870. Here are the Southern Pacific iron and car construction works, other iron-works, shipyards, dry-docks, and machine and boiler shops. It is connected with the city proper by ferry-boats, and is the terminus of two railway lines. Population 1880, 8,855; 1890, 10,811.

ALGIN. See MUCILAGE, Vol. XVII, p. 12.

ALGOL. See ASTRONOMY, Vol. II, p. 819.

ALGOMA, the northwestern district of Ontario, Canada; borders on Lakes Huron and Superior, and includes Great Manitoulin Island. It contains copper and silver mines; is well wooded and watered, and has an area of 43,150 square miles. Two branches of the Canadian Pacific railroad traverse the territory. It is populated chiefly by Indians, a few white farmers being settled in the eastern part. It is the see of an Episcopalian bishop. Population, 7,018.

ALGONKIAN PERIOD, in geology, immediately succeeds the Archæan. In the Upper Great Lakes region of North America are found the typical formations of this period. At the base of the pre-Cambrian rocks of the United States and Canada lies the Fundamental Complex, a formation of the Archæan period, and regarded by geologists as the earliest of the whole. Next above this series occurs the enormous succession of rocks roughly called Algonkian. Several distinct formations are found in this succession, which leads to the conclusion that this period may have equaled in duration the sum of several succeeding periods. In all later periods a fossil fauna may be found, of which no traces have yet been observed in the deposits of the period in question. The following table gives the formations of this period. Further details may be found in Geikie's *Text-Book of Geology*.

| | |
|---|---|
| KEWEENAWAN. (Nipigon of W. Ontario.) | Detrital rocks, derived, in large measure, from the degradation of the volcanic series below; 15,000 feet. |
| | Sheets of basic and acid lavas, with intercalated masses of sandstone and conglomerate. Said to reach a thickness of 35,000 feet. |

| | |
|---|---|
| Unconformability— | |
| UPPER HURONIAN. (Animikie and Upper Kaministiquia of W. Ontario, Animikie and Upper Vermilion of N. Minnesota, Upper Marquette of Michigan.) | Quartzites, carbonaceous and argillaceous shales, slates, conglomerates, and ferruginous rocks, with intrusive greenstones; at least 12,000 feet. Traces of organisms occur in this series. |
| Unconformability— | |
| LOWER HURONIAN. (Keewatin, Lower Kaministiquia, Ontario, Lower Vermilion of N. Minnesota, Lower Marquette, Felch Mountain iron-bearing series, Menominee of Michigan.) | Limestones, quartzites, phyllites, slates, mica-schists, green chloritic schists, schistose conglomerates, jaspers, iron ores, diabase and quartz-porphyry lavas, volcanic agglomerates and tuffs, with acid and basic intrusions. Probably more than 5,000 feet. |

ALGONA, capital of Kossuth County, north central Iowa, is 52 miles by rail from Mason City; has three newspapers and several factories. Population 1890, 2,068.

ALGONQUIN, a post township in McHenry County, northern Illinois. Crystal Lake, a popular summer resort, is located in the township, and the village of Algonquin is the center of an important dairy-farm region. Population 1880, 2,321; 1890, 2,512.

ALGONQUINS OR ALGONKINS. See INDIANS, Vol. XII, p. 827.

ALGORISM OR ALGORITHM. See NUMERALS, Vol. XVII, p. 626.

ALGUAZIL, the general name applied in Spain to inferior officers intrusted with the execution of justice.

ALHAGI, a genus of trees of the family *Leguminosæ*, found from Egypt and Greece to India. The name is of Arabic origin, and the best-known species, *A. camelorum*, is named from the fact that the manna which exudes from its leaves and branches is a favorite food of camels.

AL-HAKEM. See MOKANNA, Vol. XVI, p. 608; MOHAMMEDANISM, Vol. XVI, p. 580.

ALHAURIN-EL-GRANDE is a Spanish town in Andalusia, southern Spain. Malaga, the nearest railway point, is 15 miles N.E. of it. It is noted for its parks, its numerous fountains, the ruins of an ancient Roman aqueduct and of a Moorish fortification. In the neighboring mountains are quarries of granite, marble and freestone. Population, 6,781.

ALIBAMU INDIANS, same as ALABAMA INDIANS, in these Supplements.

ALIBERT, JEAN LOUIS, BARON, French physician and medical writer, was born at Villefranche, in Aveyron, May 12, 1766, and died at Paris, Feb. 6, 1837. In 1814 he was called as consulting-physician to Louis XVIII, and soon afterward was made first physician-in-ordinary. He wrote *Traité Complet des Maladies de la Peau* and other medical works, celebrated on account of their elegant language.

ALIBI, in law, means the defense that is frequently made by a person charged with crime, that at the time mentioned in the indictment or charge he was in another place, and therefore could not have been guilty of the offense. This defense, when fully proven, is, of course, an absolute bar to the criminal prosecution, and because it is peculiarly liable to be supported by perjury and all kinds of false evidence, it is said that this defense must be subjected to the most careful scrutiny, and must even be proven by the preponderance of the evidence; but in proving an alibi the defendant is not required to prove where he was at the exact time the crime was committed, but he is required to show only such facts as would reasonably exclude the possibility of his having been at the place where the crime was committed at the time charged. See ALIBI, Vol. I, p. 574.

ALICE MAUD MARY, Princess of Great Britain, and Grand Duchess of Hesse-Darmstadt, was born at Buckingham Palace, April 25, 1843, and died on the 14th of December, 1878. She was the third child of Queen Victoria, and married, on July 1, 1862, Prince Louis of Hesse, nephew and successor of Louis III, Grand Duke of Hesse-Darmstadt. She became the mother of five daughters and two sons. She and her eldest daughter, Victoria, died of diphtheria within a month of each other. Her death caused universal mourning in England and Germany, her charity and affection having made her greatly beloved. Her fourth daughter, Princess Alix Victoria Hélène Louise Beatrix, is the Empress of Russia, having been wedded to Nicholas II, Nov. 2, 1894.

ALIEN, in the United States, is one who was born outside of its territory and who has not become a citizen by naturalization under the laws and constitution of the United States, or any of the states. In many of the states of this country a non-resident alien cannot obtain lands by descent, or by mere operation of law. But an alien can acquire personal property, make and enforce contracts, and sue and be sued. An alien, even after becoming naturalized, cannot hold the office of President of the United States, and cannot become a member of Congress until seven years after he has become naturalized. An alien enemy is one who is a citizen of a foreign country which is at war with this country. He usually is accorded almost the same rights and privileges as an alien friend, unless ordered from the country. See ALIEN, Vol. I, p. 574.

ALIEN AND SEDITION LAWS were passed by Congress in the summer of 1798, John Adams being President, and the Federal party in full power. They raised the number of years necessary for naturalization from five to fourteen, permitted the arrest of subjects of any foreign power with which the United States should be at war, and made it a crime to publish false, scandalous and malicious writings concerning the government of the United States and its officers, for any purpose whatsoever. Finally, they empowered the President, for two years, to cause the arrest of, or to banish from the country, any alien whom he regarded as dangerous to its welfare. At that

time politicians habitually resorted to such insolent and vulgar means as have never been surpassed, and since the chief offenders were editors, largely men foreign by birth or recent descent, it was in an endeavor to suppress exasperating libels that these laws were enacted. Further, these laws have become associated with the name of John Adams, for the reason that he, mistaking a popular feeling against France for a reaction against republicanism in the United States, advocated a series of measures which subsequently proved disastrous to himself and his party, and the chief of these was the enactment of the laws in question.

As many of the Republican editors and local leaders were aliens, this law practically put that whole party into the power of a President elected by their opponents, and aroused, in consequence, its vigorous opposition. Jefferson and Madison, then foremost in that party, claimed, in this issue between individual rights and national power, that aliens were, according to the constitution's reservation of powers to the states, within the state's jurisdiction, and that criminal libel was not among the crimes constitutionally specified to be provided for by Congress. Further, they asserted that Amendment I forbade Congress to pass any law restricting freedom of speech or of the press. Doubting the impartiality of the Federal judges, were they to attempt legal procedure, the Republican leaders determined to intrench the party in the state legislatures, while the Federal party, until then enjoying the height of popularity, having become responsible for these odious laws, passed into rapid and permanent decline.

The legislatures of Virginia and of Kentucky simultaneously passed the memorable "resolutions of 1798." These, formulated by Jefferson, asserted the alien and sedition laws to be null and void, as being beyond the powers delegated to Congress, asserted the sufficiency of the state, and perilously suggested secession. The laws were never executed, and by their own stipulation expired in 1801, the same year in which Thomas Jefferson, the Republican candidate, was elected President. Their passage, which is universally regarded as a grave political blunder, dates the downfall of the Federal party.

ALIENATION is the transfer of an estate from one person to another, whether effected by sale, gift or other means, where the transmission of the estate occurs by mutual consent of the parties. It is particularly applied to a transfer of real estate by deed. Any conveyance of an interest less than the absolute title of the party making the conveyance is not an alienation; for the term has a technical meaning, and refers to a transfer of an entire interest.

ALIMA, an African river tributary to the Congo, rises in the neighborhood of the Ogowe Springs and flows west. Its course was traced by Balloy in 1878, and De Brazza founded two stations on its banks. It is navigable for steamers for some distance.

ALIMENTARY CANAL. See DIGESTIVE ORGANS, Vol. VII, pp. 221–229.

ALIMONY is an allowance to a woman, paid by her husband for her maintenance while living separate from him. Alimony is generally made by order of court, during the pendency of proceedings for divorce, or after the granting of divorce. Alimony *pendente lite* is that paid during the pendency of a suit for divorce. Permanent alimony is that paid after the termination of the suit, during the joint lives of the parties. The amount of alimony allowed depends largely upon the financial condition of the parties, and is usually fixed at about one third of their income. Alimony does not mean a particular sum of money, or an interest in the estate of the husband, but is a series of payments made for the wife's maintenance. In some states a statutory allowance of a gross sum is permitted to be made in lieu of alimony. See ALIMONY, Vol. I, p. 576.

ALISMACEÆ, a small family of monocotyledonous plants, containing about ten widely distributed genera of herbaceous plants, usually growing in water, or floating.

ALISON, SIR ARCHIBALD, JR., English general, was born at Edinburgh, Jan. 21, 1826. He was educated at the universities of Glasgow and Edinburgh, and entered the military service in 1846. His father died in 1867, and he assumed the baronetcy, having at that time the rank of colonel; served in the Crimea at the siege and fall of Sebastopol; in India, during the Mutiny, as military secretary on the staff of Lord Clyde; and as second in command upon the Ashanti expedition of 1873. He had lost an arm at the relief of Lucknow, served with honorable distinction in the Egyptian operations of 1882, and was promoted to the rank of lieutenant-general in November of that year; was placed in command of the Egyptian army of occupation. He attained his present rank on the 20th of February, 1889. He has published an authoritative treatise, *On Army Organization.*

ALIWAL, a Punjab village in northwestern India, is on the left bank of the Sutlej. Here, June 28, 1846, Sir Henry Smith, with 12,000 British troops, defeated Sikh forces of double that number.

ALKALIMETRY, the process of determining the strength of alkaline mixtures, such as commercial solutions of sodium or potassium carbonate. The process is based upon the fact that, given an amount of alkali, the amount of acid which it can saturate or neutralize may be determined, or *vice versa.* Sulphuric acid is run from a burette into a given quantity of the solution to be tested, until the alkali is neutralized. The amount of acid necessary to neutralize is proportional to the amount of alkali contained in the solution undergoing test. The apparatus used has been called an alkalimeter. A similar process is used by mint assayers to determine the strength of a solution of silver. This process of analysis has given rise to a new department of analytical chemistry, designated *volumetric analysis.*

ALKALINE LAND AND WATER. See IRRIGATION, in these Supplements.

ALKALOIDS. See Vol. I, p. 578; CHEMISTRY, Vol. V, p. 576; also CHEMISTRY, in these Supplements.

ALLAN, GEORGE WILLIAM, Canadian senator, born in Toronto, Jan. 9, 1822; graduated at Upper Canada College in 1839; called to the bar in 1846. In 1855 he was elected mayor of his native city, and from 1858 until the confederation sat in the legislative council for York division. In 1867 he was elected to the senate, and on the 17th of March, 1888, was appointed speaker of that body. He has been chancellor of Trinity College since 1876, and is now president of the Historical Society and the Society of Artists of Toronto.

ALLAN, SIR HUGH, born in Scotland, Sept. 29, 1810; died in Edinburgh, Dec. 8, 1882. In 1824 he came to Canada, engaged in the shipping business, and established the Allan line of ocean steamers. He was a director of several banks and public companies, and was knighted in 1871; became well known in Canadian politics on account of his connection with the Canadian Pacific railway scandal.

ALLAN, JOHN, American soldier, born at the Castle of Edinburgh, Scotland, Jan. 13, 1746. He emigrated to Nova Scotia in 1749, and was brought up as a farmer. In 1770 he went into politics, occupied several local offices, and gained influence with the Indians. In 1777 Congress gave him a colonel's commission, and with his Indians he protected the exposed line of the northeastern frontier. The authorities of Nova Scotia offered a price for his arrest; his house was burned, and his wife thrown into prison. In compensation for the losses he had sustained the Massachusetts government gave him 22,000 acres of land, and Congress granted him 2,000 acres in Ohio. He died in Lubec, Maine, Feb. 7, 1805.

ALLAN-KARDEC, HIPPOLYTE LÉON DENIZARD, French author and spiritualist, was born in Lyons, Oct. 3, 1803, and died in Paris, April 1, 1869. He was the leader of French spiritualists, and wrote *The Book of Mediums; The Book of Spirits;* and *The Imitation of the Gospels According to Spiritualism.*

ALLANTOIS, one of the fœtal membranes which surround the embryos of reptiles, birds and mammals. It is a saclike diverticulum which grows ventrally from the posterior end of the alimentary canal and out into the space between inner and outer amniotic folds. It is essentially a respiratory structure. In most mammals the chorion, formed by fusion of allantois and outer amniotic fold, comes into close relation with uterine blood-vessels, forming a "placenta." See MAMMALIA, Vol. XV, p. 369.

ALLARD, JEAN FRANÇOIS, French general, was born at Var in 1785, and died in India, Jan. 23, 1839. In 1815 he was adjutant to Marshal Brune, after whose assassination at the time of the Restoration he quitted France. He entered the service of Abbas-Mirza of Persia, and went to Lahore in 1820. He was made generalissimo of the Sikh army, which he organized and trained in the European modes of warfare. On his return to Paris he was received with distinction, and in 1833 was made *chargé d'affaires* in Lahore. He subsequently distinguished himself in the battles of Runjeet Singh with the Afghans.

ALLATIUS, LEO, Italian writer, was born on the island of Scio in 1586, and died at Rome in 1669. His parents were Greeks. He appeared in Rome in 1600, and was employed by Pope Gregory XV in the library of the Vatican, of which he became librarian in 1661, eight years before his death; edited the works of many classic writers, and was a prolific writer on matters of church history.

ALLATOONA, Bartow County, northwestern Georgia, is a village on the Western and Atlantic railroad, 40 miles from Atlanta. In General Sherman's pursuit of General Johnston, May, 1864, the latter made a stand at Allatoona Pass, in the vicinity, and fought until his flank had been turned. Population 1880, 778; 1890, 706.

ALLBUTT, THOMAS CLIFFORD, English physician, was born at Dewsbury in 1836, son of the Rev. Thomas Allbutt; was educated at Caius College, Cambridge, and went from there into St. George's Hospital, and, later, into the hospitals of Paris. He built up a very large practice in Yorkshire; retired from it in 1889, and in 1892 was appointed regius professor of physic in the University of Cambridge; has contributed largely to medical literature, and has recently published the *System of Medicine* (1895).

ALLEGAN, capital of Allegan County, southwestern Michigan, is situated on the Kalamazoo River, 160 miles W. of Detroit, and 33 miles by rail S. of Grand Rapids; has a considerable lumber trade. Population 1880, 2,305; 1890, 2,669.

ALLEGHANY OR ALLEGANY, a manufacturing town in Cattaraugus County, New York, is 55 miles S. of Buffalo and connected with it by rail. It is the seat of a Roman Catholic college and Franciscan convent. Population 1880, 4,044; 1890, 3,611.

ALLEGHANY SPRING, a post village of southwestern Virginia, in Montgomery County, about 80 miles W. of Lynchburg, and three miles from Alleghany Station. It is noted for its springs of saline water, and is much frequented as a summer resort. Population of district in 1890, 3,787.

ALLEGHENY OR ALLEGHANY, an important residence and manufacturing city of western Pennsylvania, capital of Allegheny County, is situated on the Allegheny River, opposite Pittsburg, with which it is connected by nine bridges. It is the terminus of important railway lines, and has numerous public institutions of importance, such as the Western University of Pennsylvania, Western (Presbyterian) Theological Seminary, and Allegheny Observatory. It contains 3 theological schools, 3 national banks, 80 churches, a college for colored persons, 2 public libraries, several hospitals and charitable institutions, and a city park of 100 acres. It has numerous factories, including rolling-mills for iron, woolen and cotton

mills, foundries, breweries, a blast-furnace, a steel-factory, and locomotive-works. It is a favorite place of residence for the business men of Pittsburg, and in many respects is really a suburb of that city, although it has a separate municipal organization. Nearly half of the inhabitants are Germans. Population 1880, 78,682; 1890, 105,287. See PITTSBURG, Vol. XIX, p. 151.

ALLEGHENY COLLEGE, a co-educational institution, was organized at Meadville, Pennsylvania, in 1815. In 1833 it came under Methodist control and is still connected with that denomination; possesses three well-equipped buildings and a library of 14,000 volumes. There are 17 instructors and 300 students. The president (1896) is Dr. William H. Crawford.

ALLEGRI, ANTONIO. See CORREGGIO, Vol. VI, p. 437.

ALLEGRO, the fourth of the five principal degrees of movement in music, implying that the piece is to be performed in a lively style. It is often modified by other terms. Allegretto is a diminutive form of this word and denotes slower time.

ALLEMANDE, a German national dance in various kinds of waltz tempo. The name has also been applied to an orchestral composition in slow, measured time, not for dancing.

ALLEN, ALEXANDER VIETS GRISWOLD, Episcopalian minister, was born at Otis, Massachusetts, May 4, 1841; educated at Kenyon College, Ohio, and graduated from Andover Theological Seminary in 1865; was appointed to the chair of ecclesiastical history at the Episcopal Theological School in Cambridge in 1867. Besides a *Life of Jonathan Edwards*, he has written *The Continuity of Christian Thought.*

ALLEN, CHARLES, American jurist, was born at Worcester, Massachusetts, Aug. 9, 1797, and died there Aug. 6, 1869. Admitted to the bar in 1818, he became in 1859 chief justice of the Massachusetts superior court; was a Free-Soil member of Congress 1849–53, and was a delegate to the peace congress of 1861.

ALLEN, CHARLES GRANT BLAIRFINDIE, English author, was born at Kingston, Canada, Feb. 24, 1848. He is best-known to his readers as Grant Allen. He graduated from Merton College, Oxford, in 1871, and soon afterward began to write on scientific subjects in a popular manner. His expositions of Darwinism are clear and captivating. He first turned his attention to fiction in 1883, and has written extensively since that time. Of his best known novels are *Strange Stories; Babylon; This Mortal Coil; Tents of Shem; In All Shades;* of his writings on more serious subjects, *The Evolutionist at Large; Flowers and their Pedigrees; Charles Darwin.* He is the author of the article on MIMICRY in this ENCYCLOPÆDIA.

ALLEN, EDWARD P., American Congressman, born in Sharon, Washtenaw County, Michigan, Oct. 28, 1839. He was graduated at the state normal school in 1864, taught for three months in the Union School at Vassar, Michigan, and then enlisted in the Twenty-ninth Michigan infantry. He served one year, when he was mustered out of the service, with his regiment, as captain. He studied law at Ann Arbor, and was admitted to practice in 1867. He was elected to the lower house of the legislature in 1876, and again in 1878; became assistant assessor of internal revenue in 1869, and United States Indian agent for Michigan in 1882–85; was elected as a Republican to the Fiftieth Congress, and again to the Fifty-first.

ALLEN, ELISHA HUNT, American diplomat, was born at New Salem, Massachusetts, Jan. 28, 1804, and died at Washington, District of Columbia, Jan. 1, 1883. He graduated from Williams College, and became a member of the Maine legislature in 1836; member of Congress from the same state (1841–43); member of the Massachusetts legislature (1849); United States consul at Honolulu (1852–56); chief justice and chancellor of the Sandwich Islands (1856–76). At the time of his death he was resident minister of the Sandwich Islands at Washington.

ALLEN, ELIZABETH AKERS, American poetess, was born at Strong, Maine, Oct. 9, 1832. In 1886 she published, over the pseudonym of "Florence Percy," *The Silver Bridge, and Other Poems.* In 1860 she married the sculptor Paul Akers, and after his death, E. M. Allen, of New York.

ALLEN, ETHAN, soldier; born in Litchfield, Connecticut, Jan. 10, 1737; died in Burlington, Vermont, Feb. 13, 1789. About 1763 he removed to near Bennington, Vermont, and in 1770 was sent to Albany to plead the cause of the New Hampshire settlers whose title to land had been disputed by Governor Tryon, of New York. The decision of the court was adverse to the settlers. Soon afterward Allen was made colonel of the "Green Mountain Boys," who sided with the New Hampshire grantees, and expelled the New York settlers. In 1775, when the news of the battle of Lexington spread throughout New England, the condition of Fort Ticonderoga attracted the attention of the patriots. It was well supplied with military stores, but only feebly garrisoned. Early on May 10th, when only 83 of his men had as yet crossed the lake, Allen rushed into the fort and summoned the astonished commander to surrender, "In the name of the Great Jehovah and the Continental Congress!" The garrison consisted of only 50 men, but the fort contained a large amount of artillery and arms. Allen received the thanks of Congress for his services on this occasion. Later in the same year he was sent by General Philip Schuyler on a secret mission to Canada, to learn the views of the Canadians as to emancipation; was captured and sent to England. After Burgoyne surrendered at Saratoga, Congress secured Allen's release on May 3, 1778. In



ETHAN ALLEN.

1779 he published a *Narrative* of his treatment while a British prisoner. In 1777 Vermont had declared its independence and sought to join the other colonies on equal terms. This proposition was opposed by New York. Allen, on obtaining his freedom, was appointed major-general of the Vermont militia, and sent as an agent to Congress to secure the admission of Vermont to the confederation.

ALLEN, Frederick De Forrest, American classical scholar, was born at Oberlin, Ohio, 1844. After his graduation from Oberlin College (1863), he studied at the University of Leipsic, and in 1866 became a professor at the University of Tennessee. After holding professorships at the University of Cincinnati and at Yale, he became, in 1880, professor of classical philology at Harvard. He revised *Hadley's Greek Grammar* in 1884, and has edited a number of classical writings. He died Aug. 4, 1897.

ALLEN, George, American scholar, was born at Milton, Vermont, Dec. 17, 1808; died at Worcester, Massachusetts, May 28, 1876. He was professor of Greek at the University of Pennsylvania from 1845 until his death; published, in 1860, a *Life of Philidor*.

ALLEN, Henry, a religious enthusiast, and founder of the Nova Scotian sect, "Allenites," was born at Newport, Rhode Island, June 14, 1748; died at Northampton, New Hampshire, Feb. 2, 1784. He preached that Adam and Eve, in their state of innocence, were non-corporeal, and that all human beings in spiritual form participated in the original transgression. He denied the resurrection of the body.

ALLEN, Harrison, American physician, born in Philadelphia, Pennsylvania, April 17, 1841. He studied medicine, and entered the United States army in 1862 as surgeon, resigning in 1865, after attaining the brevet rank of major. Since then he has been professor of physiology in the University of Pennsylvania, professor of anatomy and surgery in the Philadelphia Dental College, and surgeon of the Philadelphia Hospital; has published *Outlines of Comparative Anatomy*, and *System of Human Anatomy*.

ALLEN, Heman, American lawyer, born in Poultney, Vermont, Feb. 23, 1779. He was graduated at Dartmouth College in 1795, and then studied law; subsequently was sheriff of Chittenden County, Vermont, chief justice of the county court, a member of the legislature, United States marshal for the district of Vermont, and from 1823 to 1827 minister to Chile. He died in Highgate, Vermont, April 9, 1852.

ALLEN, Henry Watkins, American soldier and statesman, born in Prince Edward County, Virginia, April 29, 1820. He fought in the Texan war against Mexico, and in the Civil War as a Confederate colonel, always acquitting himself honorably. He was twice elected to the legislature, and in 1864 was made governor of Louisiana. He died in the City of Mexico, April 22, 1866.

ALLEN, Horatio, American civil engineer, was born at Schenectady, New York, May 10, 1802; died at Montrose, New Jersey, Dec. 31, 1889. He was graduated at Columbia College in 1823, and went into the service of the Delaware and Hudson Canal Company. In 1828 he was sent to England by this company to purchase the first locomotives used in America, and on Aug. 9, 1829, he engineered the *Stourbridge Lion* in the first locomotive trip made in America. Directly afterward he became connected with the South Carolina railroad, and built the first 100 consecutive miles of railway track ever operated; also built High Bridge over Harlem River, New York City, and was first assistant engineer of the Croton aqueduct.

ALLEN, Ira, American soldier, born in Cornwall, Connecticut, April 21, 1751. He was associated with his brother, Ethan Allen, in the dispute between New Hampshire and New York over the land grants; and when the Revolution broke out he became colonel of the militia, and took part in the battle of Bennington. From 1776 to 1777 he was a member of the Vermont legislature, and later of the constitutional convention of Vermont, the first secretary of the state, then treasurer, and surveyor-general. He was one of the founders of the University of Vermont. While on a trip to France to purchase arms for the state of Vermont he was seized by the English and thrown into prison on a charge of furnishing the Irish rebels with arms, and not until after eight years of litigation in the court of admiralty was he acquitted. He died in Philadelphia, Pennsylvania, Jan. 7, 1814.

ALLEN, James Lane, an American author; born near Lexington, Kentucky, in the heart of the blue-grass region. He was the youngest of a large family, being of Scotch-Irish parentage. His writings have attracted much attention, and are exceptionally bright and interesting. They include *Flute and Violin* (1891); *The Blue Grass Region of Kentucky* (1892); *John Gray* (1893); *A Kentucky Cardinal* (1894), and its sequel, *Aftermath* (1896); and *A Summer in Arcady* (1896).

ALLEN, Joel Asaph, American zoölogist, was born in Springfield, Massachusetts, July 19, 1838. He studied at Wilbraham Academy, then at the Lawrence Scientific School under Agassiz, and was with him on the expedition to Brazil in 1865. He accompanied scientific exploring parties to Florida and the Rocky Mountains, and was at the head of an expedition sent out by the Northern Pacific railroad in 1873. He became assistant in ornithology at the Museum of Comparative Zoölogy at Cambridge in 1870, one year later receiving the Humboldt scholarship, and since 1885 has been connected with the American Museum of Natural History at New York; is the author of *Monographs of North American Rodentia; History of North American Pinnipeds;* and works of a similar nature.

ALLEN, John Beard, American lawyer and Senator, born at Crawfordsville, Indiana, May 18, 1845. He lived at or near his native town, educating himself as best he could, until the spring of

1864, when he enlisted in the One Hundred and Twenty-eighth Indiana infantry, and served in Tennessee and Alabama until mustered out in 1865. He then removed to Rochester, Minnesota, and entered the office of Judge Wilson as a student at law, subsequently graduating from the law school at Ann Arbor, Michigan. He was admitted to the bar in 1869, and in 1870 removed to Olympia, Washington Territory, and entered upon the practice of his profession. Within a twelvemonth his practice grew to unprecedented dimensions for one so young, and he was regarded as a lawyer of great promise and an orator of unusual force and ability. In 1875 he was appointed United States attorney for Washington Territory, a position which he held for more than 10 years. In 1887, he was elected to Congress, and in 1889 he was chosen to represent the new and vigorous state of Washington in the United States Senate.

ALLEN, JOHN M., American Congressman, born in Tishomingo County, Mississippi, July 8, 1847. He received a common-school education up to the time of his enlistment in the Confederate army, in which he served through the war. He then studied at the law school of the Cumberland University, and subsequently at the University of Mississippi, being admitted to the bar in 1870. In 1875 he was made district attorney for the first judicial district of Mississippi, retiring four years later. He was elected and served from the Forty-ninth to the Fifty-fourth Congresses, inclusive, as a Democrat.

ALLEN, RICHARD, a Methodist minister, and first bishop of the African Methodist Episcopal (U.S.) Church, was ordained by Francis Asbury in 1799; became bishop in 1816, and died in Philadelphia, March 26, 1831.

ALLEN, RICHARD L., writer on agricultural subjects, was born in Hampden County, Massachusetts, 1803, and died at Stockholm, Sweden, Sept. 22, 1869. He became a merchant at Buffalo, New York, and in 1842 established the *American Agriculturist*, which soon obtained large circulation; wrote *Diseases of Domestic Animals; American Farm Book;* and works of a similar nature.

ALLEN, THOMAS, an American artist. He was born in St. Louis, Missouri, 1849. Having studied in the Rhenish provinces, he returned to America and opened a studio in Boston. He was an associate of the Academy of Design in New York and a member of the Society of American Artists. His best work is in landscape.

ALLEN, WILLIAM, author and educator, was born at Pittsfield, Massachusetts, Jan. 2, 1784; graduate of Harvard (1802); licensed to the Congregational ministry (1804); succeeded to his father's charge in Pittsfield (1810); president of Dartmouth University (1817–20), and of Bowdoin College (1820–39); retired to Northampton, Massachusetts, where he died, July 16, 1868. He was a prolific writer, but his *American Biographical and Historical Dictionary* was his most noticeable publication and went through several editions. He was the author or compiler of several volumes of devout verse.

ALLEN, WILLIAM, an American Democratic Senator from Ohio, was born at Edentown, North Carolina, 1806; studied at Chillicothe Academy, Ohio; was admitted to the bar in 1827. He was an uncle of Allen G. Thurman, of Ohio. At the early age of 24 years he acquired considerable fame by his successful defense of a client charged with murder. This led, on account of his brilliant pleading, to his election in 1831 to Congress, and as the youngest member of the House. In 1837 he took his seat in the Senate, being also the youngest member of that body. He was re-elected in 1843. In 1848 he refused the offer of the nomination of the Democratic national convention for President because he was pledged to Lewis Cass's interests. He was made governor of Ohio in 1873, and was a candidate again in 1875, but was defeated by R. B. Hayes, afterward President. Mr. Allen was an impetuous, vehement speaker, advocated greenback currency as the basis of the national monetary system, and was noted for the popular sobriquets attached to his name. He died July 11, 1879.

ALLEN, WILLIAM, an English chemist, was born in London, Aug. 29, 1770; appointed a lecturer in chemistry in Guy's Hospital in 1802; elected a fellow of the Royal Society in 1807; and was a contributor to *Philosophical Transactions.* He was also famous as a philanthropist, becoming an active promoter of reformatory and benevolent institutions. As a preacher of the Society of Friends he made numerous visits to the continent of Europe. In 1822 he met the czar of Russia, their interview relating chiefly to school questions, the slave-trade and the independence of Greece. He organized two labor training-schools in 1825 at Lindfield, Sussex. He died at the latter place, Dec. 30, 1843.

ALLEN, WILLIAM, cardinal, was born at Rossall, Lancashire, England, in 1532. He was elected fellow of Oriel College, Oxford, 1550, and, although a Catholic, retained this office until 1560. The following year he sought refuge in Flanders. He received priest's orders at Mechlin, founded the English College at Douay in 1568, and in 1587 was created cardinal, during his fourth visit to Rome. He possessed intellectual and moral gifts of a high order, and as long as he lived was the unrivaled leader of his co-religionists. He died at Rome, Oct. 16, 1594.

ALLEN, WILLIAM FRANCIS, American educator, born in Northboro, Massachusetts, Sept. 5, 1830. He was graduated at Harvard College in 1851, and passed two years of study in Germany and Italy; became instructor in the ancient languages in Antioch College, Ohio, and in 1867 professor of Latin and history in the University of Wisconsin. He published a number of text-books, also a collection of *Slave Songs.* He died Dec. 9, 1889.

ALLEN, WILLIAM HENRY, an American educator, was born in Readfield, near Augusta, Maine, March 27, 1808. He was graduated at Bowdoin College (1833); successively professor of Latin

and Greek in the Cazenovia Methodist Seminary (1833); of chemistry and natural philosophy in Dickinson College (1836); of philosophy and English literature in the same college (1846); president of Girard College from 1850 to his death, except during an interval of five years from 1863, for a part of which time he presided over the State Agricultural College. In 1872 he became president of the American Bible Society. He died at Philadelphia, Pennsylvania, Aug. 29, 1882.

ALLEN, WILLIAM SULLIVANT VANDERBILT, an American painter, and illustrator in black and white. He was born Oct. 8, 1860, in New York City; was a pupil, in France, of Gérôme and Claude Monet, and adopted the style of the impressionist school, introducing it into his figure-pieces; a member of the Society of American Artists; resides in New York.

ALLENDE, a city in the southern part of the state of Chihuahua, in north-central Mexico. It is situated in a valley that penetrates the Sierra Madre range of mountains from the east, and was settled by the Spaniards in 1570. It is about 60 miles W. of Jiminez, on the Mexican Central railroad, and was long a mere hamlet, but mining developments have caused its recent rapid growth, and it has an estimated population of 12,000.

ALLENDE, a town in the northeast of the state of Coahuila, in northeastern Mexico. It is on Eagle Pass division of the Mexican International railroad, at its junction with a railway to Zaragoza, 10 miles to the N., and is 32 miles S. from Ciudad Porfirio Diaz, on the Rio Grande. It is a place of growing commercial importance, and has a reputed population of 15,000.

ALLENDE, JEAN RAFAEL, playwright and poet of Chile, and the Tyrtæus of his country during her war with Peru and Bolivia in 1879–83, his inspiring lyrics being published by the government. In 1869, at the age of 19, he became a journalist, and in 1884 founded *El Padre Padillo*, in Santiago, his birthplace. He was the author of several successful plays and a number of volumes of verse.

ALLENTOWN, a city and the county seat of Lehigh County, Pennsylvania. See Vol. I, p. 583. Immense quantities of coal and iron ore pass through this city, and extensive blast-furnaces, rolling-mills and iron-works are in constant operation. There are also numerous tanneries, machine-shops, tube-works, shoe manufactories, fire-brick works, and woolen and other mills. Allentown contains a prison which cost a quarter of a million dollars, a handsome courthouse, and is the seat of Muhlenberg College and of Allentown Female College. Population 1890, 25,228.

ALEPPI OR ALLEPPI is a town in Travancore, India, on the coast of Malabar. It is 32 miles S.E. of Cochin, and has a considerable marine commerce. A canal connects it with a coast lake called Backwater. The place is important on account of its trade in teak, cardamoms and pepper. Population estimated at 25,000.

ALLER, a navigable river of Prussia, about 150 miles in length; rises near Magdeburg and flows northwestward, joining the Weser about 25 miles above Bremen.

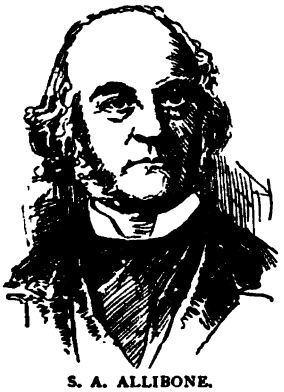
ALLERTON, ISAAC, one of the "Pilgrim Fathers"; born about 1583, sailed for America in the first voyage of the *Mayflower*, and was an enterprising member of the colony until 1631, when he had a dispute with the settlers, and removed to Marblehead, establishing several trading-stations. He died in New Haven, in 1659. Allerton's daughter, Mary, was the last survivor of the *Mayflower* company.

ALL-HALLOWS, ALLHALLOWMAS OR ALL SAINTS' DAY, a church festival, celebrated on November 1st. In 731 Pope Gregory III consecrated a chapel in Rome to the Virgin and all the saints, since which time the festival is said to have been observed in that city. The fourth pope of that name in 837 gave it observance in France, where it is called *La Tousaint*. It commemorates the faithful dead who have not a special day of their own in the calendar, these saints having become more numerous than days could be provided for them. The choice of the day was probably due to the fact that the eve preceding was one of the four great festivals among the northern nations, the policy of the Church being to substitute Christian for heathen celebrations. This day is observed by Catholics, Lutherans, and Anglicans; but the Greek Church observes a like festival on the Sunday following Whit-Sunday. See HALLOWEVEN, Vol. XI, p. 398.

ALLIANCE, a manufacturing town situated on the Mahoning River, about 57 miles from Cleveland, Ohio, with which it is connected by railroads. It is 12 miles E. of Canton by the Pittsburg and Fort Wayne railroad, and is a railroad center. It is in a rich agricultural region, and is noted for manufactures of hardware, agricultural implements, lumber, and carriages. It has banking, express and other municipal facilities. Its population in 1890 was 7,607. Mt. Union College is situated one mile from the town.

ALLIANCE OF REFORMED CHURCHES THROUGHOUT THE WORLD is known as the Presbyterian Alliance, or Pan-Presbyterian Council, the plan of which was discussed in New York City by representative men of various Presbyterian communions who were in attendance upon the meetings there of the Evangelical Alliance in 1873. Communications were subsequently opened with the churches of Presbyterian order everywhere for the purpose of forming an association or council to consider matters of common interest and to promote harmonious action as to missionary work. These measures resulted in a conference in London in 1875, 100 delegates being present, during which a plan of organization was formulated, and arrangements made for holding the first general council in Edinburgh, Scotland, in 1877, to be composed of delegates from such Presbyterian communions as should adhere to the union. At this first council there were present 249 delegates, ministerial and lay, from 40 different communions. The com-

mon ground upon which they met is thus defined in the constitution: "Any church organized on Presbyterian principles, which holds the supreme authority of the Scriptures of the Old and New Testaments in matters of faith and morals, and whose creed is in harmony with the consensus of the reformed churches, shall be eligible for admission into the alliance." The council is composed of clerical and lay delegates in equal numbers, formally chosen by the legislative body of the specific denomination they represent, but it is without authority "to interfere with the creed or constitution of any church in the alliance, or with its external or internal relations." The second general council was held in Philadelphia (1880), and the third in Belfast (1884), the number of delegates at each being close upon the number at the Edinburgh meeting. The fourth meeting was held in London (1888). The number of delegates present was 275, representing 25 countries and provinces, 78 branches, 1,392 presbyteries, and 209 synods. The total number of church members represented at this council was 3,603,209, who had contributed $30,000,000 to religious objects during the year preceding. At the meeting in Toronto (1892) there was an increase of four over the number that had been present in London. The sixth council met (1896) in Glasgow, Scotland. The objects of the organization are to promote fellowship, diffuse information, advance missionary work and reform, and to counteract infidelity and intolerance. The alliance in 1896 embraced 91 different Presbyterian denominations throughout the world, many of them, however, being missionary organizations, and it is estimated that these denominations comprised about 26,000,000 adherents. Of these denominations, 10 were in the United States, and include those denominations known as the Dutch and German Reformed Churches before they dropped the national epithet. Another organization is the Welsh Presbyterian Church in the United States. With the 600,000 adherents of the Presbyterian Church in Canada, this English-speaking constituency of North America is believed to embrace 6,500,000 souls. The proceedings of the councils are published in London and other authorized papers from time to time, and are on sale by the general secretary of the alliance there.



S. A. ALLIBONE.

ALLIBONE, SAMUEL AUSTIN, an American bibliographer, was born April 17, 1816, in Philadelphia, Pennsylvania, and entered upon a mercantile career. While thus engaged he began to compile his laborious and great *Critical Dictionary of English Literature and British and American Authors*, more briefly known as Allibone's *Dictionary of Authors*. It attempted to give the title of every book published in the English language, with sketches of each author, and excerpts from leading reviews or critical writers concerning each important book. The first volume was published by Peterson and Childs, of Philadelphia, in 1854, and the third appeared 17 years later. It is a monument of unwearying diligence, and comprises notices of about 46,500 writers. While not free from errors and imperfections, there is no other work extant to take its place among reference books, and the marvel is that one man should have had the requisite industry to produce it. In 1891 a continuation in two volumes appeared, edited by John Foster Kirke. Mr. Allibone compiled several volumes of prose and verse quotations, distributed by topics, and some pious books in the interests of evangelical faith. He was twice an editor and secretary for the American Sunday School Union, while between the ages of 50 and 63. In 1880, he became librarian of the Lenox Library in Newport. He resigned at the age of 72, went abroad, and died, Sept. 2, 1889, in Lucerne, Switzerland.

ALLIES, THOMAS WILLIAM, born at Bristol, England, in 1813. He was examining chaplain to Bishop Blomfield, who, in 1842, presented to him the rectory of Launton, Oxfordshire. He joined the Roman Catholic communion in 1850, and published the *See of St. Peter*, in which he accounted for his conversion. He was excluded from the priestly office by his marriage, and subsequently became secretary to the Catholic School Committee. He published, among other works, *St. Peter, His Name and Office as Set Forth in Holy Scripture; The Formation of Christendom; Per Crucem ad Lucem, The Result of a Life;* and *Dr. Pusey and the Ancient Church.*

ALLIGATION, meaning "to bind together," is a rule of arithmetic relating to the solution of questions concerning the compounding or mixing of different ingredients, or ingredients of different qualities or values. The simplest form of alligation is seen in the following example: 3 lb of coffee, @ 45c, are mixed with 5 lb, @ 55c: what is the price of 1 lb of the mixture? The result is attained by adding the products of the price and quantities of each and dividing by two sums of the quantities; that is, add 135 to 275 and divide by 8. This gives the solution, 51¼c.

ALLIGATOR-PEAR. See CUSTARD-APPLE, Vol. VI, p. 729.

ALLINGHAM, HELEN PATERSON, wife of William Allingham, the poet, was born near Burton-on-Trent, England, Sept. 26, 1848. Her maiden name was Paterson. Going to London, she entered the schools of the Royal Academy in 1867, eventually becoming one of the art staff of the *Graphic*. Amongst other bookwork, she furnished illustrations to the novels published in the *Cornhill Magazine*. She also produced many water-color drawings, exhibiting at the leading galleries. *The Milkmaid* and *Wait for Me* were exhibited at the Royal Academy in 1874. Next year she was elected an associate of the Royal Society of Painters in Water Color, and in 1890

to the full membership. Her portraits of Carlyle are well known.

ALLINGHAM, WILLIAM, a popular poet, of English family, born at Ballyshannon, in Ireland, in 1828. He contributed to the *Athenæum*, *Household Words*, and other journals, while doing the duties of a commissioner of taxes in London, and in 1874 he succeeded Froude as editor of *Fraser's Magazine*. In this year he married Helen Paterson, the artist. His first volume of poems appeared in 1850; his second, *Day and Night Songs*, in 1854, and in an enlarged form, illustrated by Rossetti and Millais, the year after. In 1864 first appeared, in book-form, *Lawrence Bloomfield in Ireland*, a narrative poem of contemporary Irish life. He published, in 1877, *Songs, Ballads and Stories*, a collection of new pieces, together with revised versions of earlier poems, and in 1887, *Irish Songs and Poems*. He died in London, Nov. 20, 1889.

ALLIOLI, JOSEPH FRANZ, a German Roman Catholic theologian, was born at Sulzbach, Aug. 10, 1793. He was appointed to the chair of theology at Munich, 1826, and later provost of Augsburg Cathedral. He is known chiefly through his translation of the Bible into German, which work reached a sixth edition. He died, Aug. 22, 1873, in Augsburg.

ALLISON, capital of Butler County, northeastern Iowa, is situated in the center of the county, on the Chicago and Great Western railroad, 23 miles W. of Waverly. Population 1895, 436.

ALLISON, JOHN, an American politician. He was born at Beaver, Pennsylvania, Aug. 5, 1812. After having served several terms in the state legislature, he served two terms in Congress (1852–53, 1856–57). Conspicuous in founding the Republican party, in 1860 he was also a delegate to the Republican convention which nominated Abraham Lincoln. He served as a staff-officer during the Civil War, and died at Washington, District of Columbia, in 1878, while holding the office of Registrar of the United States Treasury.

ALLISON, WILLIAM B., an American Republican statesman, was born in Perry, Ohio, March 2, 1829, and educated at the Western Reserve College, in that state. He practiced law in Ohio until 1857, when he removed to Iowa. On the breaking out of the Civil War, he became a member of the governor's staff, and aided in the organization of the Iowa volunteers. He was elected to Congress in 1862, served four terms, and in 1873 was chosen United States Senator, in succession to James Harlan. In 1878, 1884, and 1890 he was re-elected. His present term of office will expire March 3, 1897. In the Fifty-second Congress he was chairman of the finance committee. In 1892 he was a delegate from the United States to the international monetary congress at Brussels.



WILLIAM B. ALLISON.

ALLIUM, the largest genus of *Liliaceæ*, containing about 300 species. They are perennial, or rarely biennial, herbaceous plants, natives chiefly of the temperate or colder regions of the northern hemisphere. They are bulbous, with a characteristic odor, and bear their flowers in an umbel at the summit of a scape which arises from the middle of a cluster of radical leaves. Some of the more common cultivated species are the garlic, onion, leek, shallot and chive.

ALLMAN, GEORGE JAMES, an Irish naturalist, was born at Cork, Ireland, 1812. Graduating in the medical department at Trinity College, Dublin, 1844, he was appointed the same year to the chair of botany in that college. In 1855, he became professor of natural history in the University of Edinburgh, Scotland, which position he held till 1870. His chief works include a *History of the Fresh-Water Polyzoa*, and *Hydroida of the Challenger Expedition*. He was elected a fellow of the Royal Society, London, in 1854; and received the honorary degree of LL.D. from Edinburgh University after his retirement from his chair therein. In 1879 he was president of the British Association for the Advancement of Science. He was president of the Linnæan Society from 1874 to 1883.

ALLMOUTH. See DEVIL-FISH, Vol. VII, p. 138.

ALLOBROGES, a Celtic race of Gaul, allies of Hannibal at the time of his invasion, 218 B.C. They were subjected to the Roman yoke in 121 B.C., by Quintus Fabius Maximus, and from that time governed as a part of Gallia Narbonensis. Their capital was Vienna (now Vienne), on the Rhône.

ALLOCUTION, in the language of the Vatican, denotes the address delivered by the pope to the College of Cardinals on any important ecclesiastical or political circumstance. When the papal court desires to guard a principle which it is obliged to relinquish in a particular case, or to reserve a claim for the future which has no chance of present recognition, it makes use of this form of address. Allocutions are published by being affixed to the doors of St. Peter's at Rome.

ALLOMERISM, in chemistry, is the term applied to crystalline matter possessing the property of remaining unchanged in form while varying in its chemical constituents or proportions.

ALLON, HENRY, an English Congregational minister and author, was born Oct. 13, 1818, at Welton, Yorkshire, England. He was educated at Cheshunt College, Hertfordshire; and in January, 1844, was ordained assistant pastor of Union Chapel, Islington, London, and in 1852 sole pastor of the congregation. He became eminent in his denomination, and was chosen chairman of the Congregational Union in 1864, and again in 1881. In addition to his ministerial duties he has been a prolific writer, and was editor of the *British Quarterly Review*, from 1865 to 1887. He published the *Congregational Psalmist* and *The Vision of God* (1876), the latter being a volume of his own sermons, which had an extensive sale. Yale College, New Haven, Connecticut, conferred upon him the degree of D.D. in 1871. St. Andrew's University, Scotland, conferred the same degree upon him in 1885. He died in London, Oct. 16, 1892.

ALLOPATHY, a term originated by Hahnemann

for a system of medical treatment founded on the dictum expressed by Hippocrates that "opposites are remedies for opposites," and which proceeded upon the plan of using medicines that in a healthy person induced conditions of a character antagonistic to those sought to be removed. The term has long been obsolete. It is objectionable, as scientific practitioners cannot restrict themselves to such limitations on the treatment of disease; as with the development, for instance, of bacteriology, entirely new resources have been brought into prominence and taken advantage of extensively. The practice of allopathy was opposed to that of HOMŒOPATHY; q.v., Vol. XII, p. 129; Vol. XV, p. 814; also HAHNEMANN, Vol. XI, p. 333.

ALLOTMENTS. In England allotments are small plats of common-land let to agricultural laborers, who cultivate them during their spare time. The custom of letting allotments varies in different parts of the country, a quarter of an acre being about the average size of plats. When wisely applied it has been found to be a beneficial system.

ALLOWAY, the birthplace of Robert Burns, the Scottish national poet. It is situated on the right bank of the Doon, south of the town of Ayr, Scotland. The low, thatched cottage in which the poet was born, Jan. 25, 1759, was converted in 1880 into a Burns museum. The roofless ruin of the "haunted kirk" is still standing, and near by is the Burns monument and the "aul' brig o' Doon."

ALLOXANTIN, a compound obtained by the mixture of dialuric acid with alloxan. It forms small, white, hard, brilliant prismatic crystals, is freely dissolved by boiling water, and its solution reddens litmus.

ALLOYS OF COPPER, TIN AND ZINC. See STRENGTH OF MATERIAL, in these Supplements.

ALLOYS, NEW. The study of alloys is carried on systematically in connection with various trades, and is often discussed by engineering societies. Most of the valuable alloys of recent years contain aluminum, which metal has been subjected to a very wide examination in many quarters. Aluminum bronze alloys are the most valuable yet discovered. The proportion of aluminum used is from 5 to 11½ per cent. The 10-per-cent mixture affords great tensile strength. It is yellow, melts at about 1700° F., and is malleable at a red heat.

Electrotypers have found an alloy of about 13 parts tin with aluminum to form a useful non-shrinking combination. A six-per-cent alloy of copper with aluminum has been found best for sheathing torpedo-boats. Steel alloyed with 8 per cent of copper and 12 per cent of aluminum is used for bicycle-frames. German silver and aluminum are also added to steel for the same purpose, a high tensile strength being secured, and the color being whiter than pure aluminum.

Promethium of titan metal is the name of a new alloy, consisting of 60 per cent copper, 38 zinc, 2 aluminum, a minute quantity of sodium being added to the molten mass in casting. It possesses remarkable resistance.

Recent tests show that a little arsenic adds strength to copper. Some experimenting has been done with the rarer metals, and one interesting alloy has been found, of two tenths of one per cent zirconium with gold, yielding a bright green alloy, useful in the manufacture of jewelry.

A committee of English engineers in 1895 made an exhaustive report on the subject of alloys, showing the freezing-points of many combinations, and that many of them have two freezing-points.

ALL-SAINTS' BAY indents the coast of the province of Bahia, Brazil. It has a fine natural harbor, in which the navies of the world might ride at anchor. The harbor has easy entrances on both sides of the island Itaparica. Its length from north to south is 37 miles, its breadth 27.

ALL SAINTS' DAY. See ALL-HALLOWS, in these Supplements.

ALLSOPP, SAMUEL, born in 1780. He was a member of the brewing establishment of Alsopp and Sons at Burton-on-Trent, England. He was noted for his charities. He died in 1838, and was succeeded in the business by his sons, Charles, James, and Henry. The last-named entered Parliament in 1874, and in 1880 was named a baronet. After his retirement from the firm he was raised to the peerage as Baron Hindlip. He died April 3, 1887.

ALL SOULS' DAY, a day of devotion in the Roman Catholic Church, held on the 2d of November. By prayers and almsgiving it is sought to alleviate the sufferings of the souls in purgatory. It was first instituted in the monastery of Clugny (Cluny), France, in 993, A.D. Its origin is related as follows: Returning from the Holy Land, a pilgrim, by stress of weather, was stranded on a rocky isle between Sicily and Thessalonica. A hermit, whom he met on the isle, told him that among the rocky ravines was the opening to the lower world. Flames were to be observed issuing from this opening, and even the agonized cries of the souls in torment below could be heard. The hermit had also heard the loud denunciations of the evil spirits against those who, by their prayers and alms, had been successful in securing the release of the tormented souls therefrom. These evil spirits were specially exercised against the monks of Cluny. At length, on reaching this monastery, the pilgrim acquainted Odilo, the abbott. The latter thereupon announced the dedication of the day named for the special purposes mentioned above.

ALLSPICE, the fruit of *Eugenia Pimenta* and *E. acris;* also called pimento and Jamaica pepper. It is supposed to combine the flavor of cinnamon, nutmeg, and cloves. The name is also applied to certain spicy plants, such as *Calycanthus floridus* ("sweet-scented shrub"); *Chimonanthus fragrans*, and *Lindera Benzoin* ("spice-bush").

ALLSTON, ROBERT FRANCIS WITHERS, an American governor; was born in All Saints' Parish, South Carolina, April 21, 1801. He graduated at West Point in 1821, and was assigned to the artillery service, but resigned at the end of a year. He returned to his native state, engaging in agriculture and surveying, in both of which pursuits he became noted. He was made state surveyor-general in 1823, holding the office four years. In 1828 he was elected to the legislature, and in 1831 was appointed deputy adjutant-general, which office he held till

1838. He entered the state senate in 1832 and became successively acting president and president. In 1856 he was elected governor of the state. He published several works on rice-culture and the cultivation of sea-coast plants. He died at his home near Georgetown, April 7, 1864.

ALLSTON, WASHINGTON, American painter and poet, born in Waccamaw, South Carolina, Nov. 5, 1779. He was graduated at Harvard in 1800, and studied at the Royal Academy, London, and also at Paris and Rome. He returned to America in 1809, but again sought England in 1811, remaining seven years, during which time he produced *The Dead Man Revived*, *Uriel in the Sun*, and *Jacob's Feast*, besides other pictures. In 1818 he was elected an associate of the Royal Academy, London, and in this year removed his studio to Boston, where he painted *Jeremiah*, *The Witch of Endor*, *Miriam*, *Rosalie*, *Madonna*, *Spanish Girl*, *Spalatro's Vision of the Bloody Hand*, and *Belshazzar's Feast*. He also painted portraits of Coleridge, Benjamin West, a countryman, who was president of the Royal Academy, and one of himself. Allston was also a man of literary talent; his books are *The Sylphs of the Season*, published in London (1813); *The Paint King; The Two Painters; Monaldi* (1841); and *Lectures on Art*, and *Poems*, published posthumously (1850). He died in Cambridge, Massachusetts, July 9, 1843.



WASHINGTON ALLSTON.

ALLUVION. See RIPARIAN LAWS, Vol. XX, pp. 565, 566.

ALMA, capital of Wabaunsee County, northeastern Kansas. It is situated at the intersection of the Union Pacific and Manhattan, Alma and Burlington railroads, about 35 miles W. and S. of Topeka. It has good stone-quarries, and water-power furnished by a branch of the Kansas River. Population 1880, 362; 1890, 1,125.

ALMA, a town in Gratiot County, northeastern Michigan, on the Pine River. It is on the Detroit, Lansing and Northern, and Toledo, Ann Arbor and Northern Michigan railroads. It is about 32 miles W. of Saginaw and 9 miles N. of Ithaca. It has considerable miscellaneous manufactures. It is the seat of Alma College, a Presbyterian institution. Population 1880, 437; 1890, 1,655.

ALMA, capital of Harlan County, central southern Nebraska, situated on the left bank of the Republican River, on the Grand River and Burlington and Missouri River railroads, about 20 miles W. of Bloomington. Population 1880, 298; 1890, 905.

ALMA, capital of Buffalo County, central western Wisconsin, situated at the junction of the Mississippi and Buffalo rivers, on the Chicago, Burlington and Northern railroads, 52 miles N. of La Crosse. In its vicinity are the noted "Beef Slough Booms." Population 1890, 1,428; 1895, 1,529.

ALMACANTAR OR ALMUCANTOR, an astronomical term derived from the Arabic, applied to a circle of altitude of the celestial sphere parallel to the horizon, or simply a circle or parallel of altitude. The word is now commonly applied to an instrument recently invented by S. C. Chandler for the observation of heavenly bodies as they cross a given "almacantar line," for the purpose of ascertaining their right ascension and declination with greater accuracy than with a meridian circle, and thus affording more accurate data in determining time and latitude. Its essential parts consist of a telescope accommodated with horizontal wires, the whole attached to a float sustained in a trough of mercury. The float, by being turned around the telescope, can be pointed east of the meridian, so that the time of a star's rising over the horizontal wires can be noted. Similarly, the time of its descending can be fixed. Hence, the positions of the stars being known, it is possible to obtain correct time and to determine latitude. If the correct time and latitude are known, the apparent positions of the stars as to ascension and declination can be ascertained.

ALMACK'S, the name of two places in London during the end of the last and earlier part of the present century. The former was a gaming-club situated in Pall Mall; the latter place consisted of a suite of assembly-rooms in King William Street, St. James. Both places became famous. They were under the management of William Almack, a tavern-keeper, whom his descendants claim to be a Yorkshireman, but who is generally believed to have been a Scotch Highlander named MacCall, who disguised his nationality, then little esteemed in London, and inverted the syllables of his patronymic. The first-named resort became later known as "Brook's," the resort of a famous Whig club. Among the original members were the Duke of Portland and Charles James Fox, subsequent members being Edward Gibbon, William Pitt, and others of distinction. The other resort, "Almack's Assembly Rooms," became famous for the balls given there under the management of a committee of ladies of high rank, and was noted for its exclusiveness. After the year 1840 its credit began to wane. The rooms have since become known as Willis's Rooms, so called from the name borne by Almack's heir. They are used for dinners and concerts, as well as balls.

ALMADA, a town of Portugal, in the province of Estremadura. It is built upon a height over the Tagus, opposite Lisbon. It is principally known as a depot for wine. Population, 5,091.

ALMADEN is a township of Santa Clara County, west-central California, named, on account of its cinnabar-mines, from the Spanish Almaden, where were situated the most famous quicksilver-mines ever known. The most productive mine is located at the town of New Almaden, situated on a hill overlooking a picturesque valley. New Almaden is connected by two spurs of the Southern Pacific railroad, with Hillsdale in the northeast and Campbell in the northwest. New Almaden is about 20 miles S. of San José. The total amount of ore of all descriptions roasted from 1880 to 1889 was 346,888.39 tons, from which were produced 217,095 flasks of quicksilver (76.5 pounds per flask).

ALMANACS, AMERICAN. In 1637 there was issued from the press of William Bradford, Philadelphia, what is believed to have been the first general almanac published in the United States. From 1726 to 1775 was issued an almanac from Dedham, Massachusetts, commenced in the former year by Nathaniel Ames (q.v., in these Supplements), which was conspicuous for its astronomical calculations. In 1732 Benjamin Franklin began his famous *Poor Richard's Almanac*, which, on account of its thrifty philosophy, achieved widespread fame. It was continued for twenty-five years. The next almanac of importance was *The American Almanac and Repository of Useful Knowledge*, commenced in 1828, and issued from Boston. It survived until 1861. It was revived as *The National Almanac*, with issues in 1863–64. In 1849 was commenced, by Lieutenant (afterward Rear-Admiral) Charles Henry Davis, of the navy, *The American Ephermis and Nautical Almanac*, which became the official authority in navigation. The first volume, computed for the year 1855, was published in 1853. In 1878, A. R. Spofford, librarian of Congress, commenced the issue of his *American Almanac and Treasury of Facts, Statistical, Financial and Political.* This compilation was continued for ten years. Many of the leading newspapers have published almanacs for a number of years. Those published by the New York journals cover a wide range and are excellent reference manuals. Of these the best known are *The World Almanac*, *The New York Herald Almanac*, and *The Sun Almanac.* The last is strong in its political statistics, while the first is of general utility as a year-book. These almanacs circulate all over the country. The ecclesiastical almanacs form an important class. They contain the statistics, each of its own denomination, with clerical lists and an account of educational and benevolent institutions. The sporting and dramatic interests are well served by yearly compilations of events and matters of a statistical and other nature. The manufacturing industries have also followed in this line, publishing and circulating condensed almanacs, accompanied by special information relating to their products. The vendors of patent medicines have very largely adopted this means of advertising their remedies. So thoroughly have they developed this field that they issue these almanacs in all languages, making them in many instances household necessities. All these almanacs have calendars which are based upon the great *Nautical* for their astronomical data. For a general history of their origin and development, see ALMANACS, Vol. I, p. 590.

ALMANDINE. See MINERALOGY, Vol. XVI, p. 411; also GARNET, Vol. X, p. 82.

ALMANSUR OR ALMANZOR, four caliphs. See MANSUR, Vol. XV, p. 500.

ALMA-TADEMA, LAWRENCE, an English artist, was born at Dronryp, in the Netherlands, Jan. 8, 1836, of a very ancient family. In 1852 he entered the Academy of Antwerp, and subsequently studied under Baron Henry Leys. Having settled permanently in England, he became a British subject in 1873. His works are distinguished for their careful composition, accuracy of design, and the beauty and finish of their coloring. There is a preponderance among them of classical subjects. The following may be mentioned as a few of the works embodying the general characteristics of his art: *Entrance to a Roman Theatre* (1866); *A Roman Amateur* (1868); *The Vintage* (1870); *The Mummy* (1872); *The Way to the Temple*, for which he received the diploma of the Royal Academy (1883); *A Reading from Homer* (1885), exhibited at the World's Fair; *The Roses of Heliogabalus* (1888); *A Dedication to Bacchus* (1889), and *At the Close of a Joyful Day.* In 1876 Alma-Tadema exhibited a series of three pictures at the Grosvenor Gallery, entitled, respectively, *Architecture*, *Sculpture*, and *Painting;* and at the same gallery, in 1883, there was a special exhibition of his works. He was elected A.R.A. in 1876, and R.A. in 1879. In 1878 he was made an officer of the Legion of Honor, and he has also received the decorations of several continental orders of knighthood. His two daughters, by his first wife, have already distinguished themselves by their artistic productions. His second wife—a daughter of Dr. George Epps—has secured notice, also, as an artist, having exhibited works at the Royal Academy and other galleries.



LAWRENCE ALMA-TADEMA.

ALMEH OR ALMAH, the name given to a professional female singer of the higher class in Egypt. The awâlim sing by appointment before the guests of the rich, being paid for their services. They must be distinguished from the ghawazis, who are a common class of dancers.

ALMEIDA, a seaport in the province of Espirito Santo, Brazil, founded in 1580 by the Jesuits. It is situated at the mouth of the Reis-Magos, 20 miles N. of Victoria. Population, 4,000.

ALMEIDA-GARRETT, JOÃO BAPTISTA D', a Portuguese statesman and poet, born at Oporto, Feb. 14, 1799. He became minister of public instruction in 1820, holding the position until compelled to leave the country in 1823, on account of the political situation. Passing his exile in France, he there imbibed the ideas of the Romantic school, which led, on his return to his native country in 1832, to his making his remarkable collection of the folk-lore and ballads of Portugal. He was thus the founder of a national literature, pure and independent of foreign influence. Besides this collection, called *Romanceiro* (3 volumes), he published a *Historical Sketch of Portuguese Literature; Adozinda*, a romance in verse; and *Camöens*, an epic poem. He attempted to found a national drama, *Auto de Gil-Vicente*, the first of that class produced in Portugal (1838). After having been appointed minister to Belgium in 1834, and holding other offices at home, he was made a peer in 1852. He died in Lisbon, Dec. 9, 1854.

ALMODÓVAR DEL CAMPO, a town of Ciudad Real, Spain, 22 miles S.W. of the city of that

name. The inhabitants are chiefly employed in silver-mining. Population, 10,362.

ALMODÓVAR, Ildefonso Diaz de Ribera, Count, born at Granada, Spain, 1777; distinguished himself in the war against the French upon their invasion of Spain in 1808–14, for the purpose of establishing Joseph, the brother of the French emperor, on the Spanish throne. On the restoration of Ferdinand VII, Almodovar, being suspected of favoring the Liberal party, was confined in the dungeons of the Inquisition. Securing his freedom during the revolution incited by the Spanish Liberals in 1820, he retired to France in 1823, on the restoration of the Spanish king. On the death of Ferdinand VII in 1833, the count returned to Spain, and became for a time minister of war, which office he relinquished in 1843. He died Jan. 26, 1846, at Valencia.

ALMONACID DE TOLEDO, a Spanish town in the province of Toledo, 13 miles S.E. of the city of that name, noted as the place where King Joseph (brother of Napoleon Bonaparte) defeated the Spaniards in 1809.

ALMOND, a name applied to the stone or kernel of the fruit of *Prunus communis*, a genus of *Rosaceæ*. The plant is closely related to the peach, and by some believed to be its ancestral form. The almond fruit has a hard and fibrous "flesh," which has become pulpy and luscious in the peach. The kernel of the stone is the edible part. The almond tree grows to the height of 20 or 30 feet, and is thought to be a native of the Mediterranean region and Western Asia, but has now become completely wild in the entire south of Europe. It appears to have been cultivated from a very early period, and is mentioned in the Old Testament. It was introduced into Britain before the middle of the sixteenth century as a fruit-tree, but it is only in the most favored situations of the south of England that it ever produces good fruit. In California it is being extensively and very successfully cultivated. The wood of the almond tree is of a reddish color, and hard, and is used by cabinet-makers, etc. Almonds are of numerous varieties, but they can all be grouped as sweet or bitter. The bitter appear to be the original kind, and the sweet a variety improved by cultivation. Large quantities of almonds are annually imported into Britain and America from France, Spain, Italy and the Levant. See Almond, Vol. I, p. 594.

ALMONDS, Oils of. A fixed greasy oil exudes when almonds are subjected to pressure. Either bitter or sweet almonds may be employed; the former are generally used, and are not so expensive as the sweet. One hundredweight of the almonds generally yields from 48 to 52 pounds of the fixed oil. It has a specific gravity of 918, and solidifies when reduced to 13° F. It has no odor. It is used as medicine, and possesses a mild laxative property when administered in large does. The cake which is left after the expression of fixed oil from the bitter almonds is valuable in the preparation of the essential oil. It contains, among other matters, a portion of two substances, called amygdalin and emulsion. When the cake is made into paste with water, the synaptase, as a ferment, acts upon the amygdalin. The volatile principle is not originally present in the bitter almonds. It does not contain a trace of the oil already formed, so the oil is purely the product of the fermentation of amygdalin, 100 parts of which yield 47 of crude oil. Commercial oil of the bitter almond has a golden color, but can be purified until almost colorless. The crude oil is very poisonous, owing to the prussic hydrocyanic acid (chem. com. H C N) dissolved therein.

ALMONTE, a town in Lanark County, northeastern Ontario, on the Mississippi River (a feeder of the Ottawa River), on the Canadian Pacific railroad, 35 miles S.W. of Ottawa. It has considerable woolen manufactures and an iron foundry. Population 1895, 3,072.

ALMONTE, Juan Nepomuceno, a Mexican statesman, born at Valladolid, Mexico, in 1804. He received his education in the United States, and returned to Mexico, obtaining a position on the staff of Santa Anna. He served in the Texan campaign, and was made prisoner at the battle of San Jacinto (1836). On regaining his liberty he was made secretary of state under Bustamente, the Mexican president, and quelled a rebellion in 1840. He was minister at Washington when the annexation of Texas was resolved upon. Demanding his passports, he returned home, and in 1845 was an unsuccessful candidate for the presidency of the Mexican republic. Later he became minister of war under Paredes, who appointed him minister to Paris, but he returned to Mexico before reaching his destination, on hearing of the restoration to power of Santa Anna. He took part in the war with the United States in 1847, and was present at the battles of Buena Vista, Cerro Gordo and Churubusco. He was again an unsuccessful candidate for the presidency, but was appointed minister at Paris, from which post he returned to Mexico with the French in 1862. The French commander, declaring Juarez deposed, appointed Almonte in his place, but the latter was unable to organize his government. Subsequently he was made one of the triumvirate to whom the French intrusted the management of the affairs of the country. Under Maximilian he was appointed lieutenant of the empire, and then marshal. On the fall of the emperor he retired to Paris, and died there, March 20, 1869.

ALMSHOUSES, termed poorhouses in Scotland and workhouses in England. They are institutions for the benefit of the sick and poor. In London, almshouses were established in the reign of William and Mary, and in Ireland in 1838. Compulsory labor for all paupers able to work was introduced in 1600. In the United States, almshouses are maintained by municipal or county authorities, and town farms are attached in several states. Blackwell's Island in New York, Tewksbury and Deer Island in Massachusetts, and Philadelphia County Almshouse in Pennsylvania are among the celebrated institutions of this character. The problem involved in the treatment of the pauper class is one of the most difficult among social studies. The system in force is one of the miserable contemplations of civilization. Whoever fail to be immediately committed as vagrants, or to be sent to the houses of

correction, find a ready asylum in the almshouses and learn to depend upon them, becoming chronic refugees, whom nothing will seduce from such repose, or arouse to efforts of personal exertion for their own support. Another deplorable phase of this question is the treatment of idiots, epileptics and others afflicted similarly, constitutionally and incurably. To these the doors of the almshouses have been open. The more this tendency can be checked, the simpler would be the general problem. The distribution of this class of chronics among special hospitals and homes should be more systematically undertaken. In such an environment as is to be found in an almshouse, no children should be reared. The congregation of such miscellaneous classes cannot fail to be prejudicial to the children of misfortune who have to be reared therein. The more effective localization or settlement of the poor in places wherein they have become identified is another of the chief means of dealing satisfactorily with the problem. By this means proper identification can be perfected, the tracing of wanderers made easy, and imposture rendered impossible. Uniformity of treatment is an important element of success, that should be secured as far as organization and co-operation can accomplish. While nearly every county has its poorhouse, the systems of different states, and even of the several counties of one state, are not uniform. The following particulars furnish some interesting information on points which have been dealt with statistically. The total number of paupers in the almshouses of the United States in 1890 was 73,045; of which number 40,741 were males and 32,304 were females. Of the total number, 6,467 were colored,—3,354 males and 3,113 females. In 1850 the total number of paupers was 50,353; but the ratio to the million of population was, in 1850, 2,171; while in 1890 the ratio was only 1,166 to the million. Of the total number, there were 4,529 whose parents (either one or both) were born abroad, and 10,608 whose parents (one or both) were unknown to them; 27,648 were foreign-born, and 2,274 did not know the country of their birth. The preponderating nationality represented is Irish, 16,246 fathers and 16,173 mothers of the total number having been born in Ireland. From Germany came 7,836 fathers and 7,793 mothers. Of 16,991 male foreign-born paupers, 8,094 were aliens, and 11,252 claimed to have resided ten years or more in the United States. As to the literacy of the total number, 66,590 could speak English, 27,085 were illiterate, and 40,441 could read and write. Of the 5,871 children under sixteen years of age, 4,058 were taught neither in the institution nor in the public schools. As to the marital relations of the total number, 39,278 were single, 11,571 were married, 18,421 were widowed and 711 divorced; the balance were not classified. Of the total number 2,555 were under 5 years of age, 1,783 were 5 and under 9, 1,289 were 10 and under 14, and 1,623 were 15 to 20. There were 68 inmates over 100 years of age, the oldest recorded age being 123, attained by a pauper in Georgia. Of 15,460 paupers, 9,828 had children; and of the 5,871 children under 16 years of age, 1,899 were illegitimate, 1,508 were said to have been abandoned by their parents, and 1,369 were born in the institution. Of these children, 2,132 had their parents living, 2,666 had been surrendered to the institution, and 322 were foundlings. Of the causes of pauperism, 20,121 were classed as aged and infirm; 10,373 as being crippled; 4,094 as drunkards, and 72,722 as having no other home. Of the total number, 29,521 were able-bodied. And as to the state of health, 22,695 were in good health, 13,236 were sick, 16,440 were insane, 7,811 were idiots, 880 were crippled, and 3,983 blind and deaf; the rest being classed as paralytics, epileptics, etc. The total number of insane patients in asylums was 58,866. Of the total number, 20,684 had no occupations, and 35,422 claimed residence in the states to which the institution belonged. Of the total number, 73,007 were maintained at the public cost, 761 at the cost of the institution, and 311 at the expense of their friends. A comparison of the figures shows that, among the larger cities, Philadelphia maintained, in 1890, 2,965 paupers; Chicago (Cook County) had 2,070; New York County (Blackwell's Island, etc.), 1,834; and King's County (Brooklyn), 1,036.

ALMUCANTAR. See ALMACANTAR, in these Supplements.

ALMY, JOHN J., American naval officer, born in Rhode Island, April 25, 1814. He entered the navy as midshipman, and rose through all the successive grades to be rear-admiral in 1873. He saw much active service, and commanded the gunboats *South Carolina*, *Connecticut* and *Juniata*. While commanding the second-named he captured four blockade-runners with valuable cargoes, also destroying others. He was retired April 24, 1877, and died May 16, 1895.

ALMY, WILLIAM, American philanthropist, born in Providence, Rhode Island, Feb. 17, 1761. He was a member of the Society of Friends, and became able to indulge his charitable inclinations on his marriage with an heiress. Among his important charities was the establishment of the New England yearly boarding-house, where he educated 80 young persons at his own expense. He died Feb. 5, 1836.

ALNWICK CASTLE. See ALNWICK, Vol. I, p. 596.

ALOE, AMERICAN. See Agave, under ALOE, Vol. I, p. 597.

ALOES, a drug which is the inspissated juice or extract of several species of the genus *Aloë*, one of the *Liliaceæ*, and a native of tropical regions; a stimulating and purgative drug of bitter taste, and much used in medicine, combined with other cathartics. The various kinds known in commerce are named from their geographical source (Socotrine aloes, Zanzibar aloes, Barbadoes aloes, Cape aloes, Natal aloes, etc.), and are mostly obtained from different species.

ALOES-WOOD is the heart-wood of *Aquilaria Agallocha*, a tree of the family *Thymeleaceæ*, native of the tropical parts of Asia, and supposed to be the lignaloes of the Bible. Aloes-wood contains a dark-colored, fragrant, resinous substance, much esteemed in the East as a medicine and for the

pleasant odor it diffuses in burning, and especially by the Chinese as an incense in their religious ceremonies. Named also Agallochum.

ALOFSEN, SOLOMON, historian and bibliophile, born in Amsterdam, Netherlands, Nov. 22, 1808. He came to the United States in early manhood, in the diplomatic service. Liking the country, he resolved to make it his home, marrying an American lady, and became connected with the railroad business. He pursued the study of history and ethnology, and was an assiduous book-collector, especially of Americana, which became particularly rich in works relating to the Civil War. He died in Arnheim, Holland, Oct. 10, 1876.

ALOGI, a religious sect that came into existence during the second century. The Alogians denied the doctrine that Jesus is the Logos, or divine "Word," and rejected the gospel of St. John and the Apocalypse. They also considered that the gift of miracle mentioned in the New Testament had ceased to be operative.

ALOMPRA, a Burmese king. See BURMAH, Vol. IV, p. 556.

ALOPECIA. See SKIN DISEASES, Vol. XXII, p. 121.

ALORA, a town of Spain, in the center of the province of Malaga. It is 24 miles N.W. of Malaga, on the Guadalhorce. Oil-pressing and soap-manufacturing are its chief industries. It contains the ruins of an ancient castle. Population, 10,014.

ALOSA, a genus of fishes of the *Clupeidæ* or herring family. The name was originally given by Pennant to the allice-shad (*A. communis*). The genus contains two British species,—the one just named, and the *A. finta*, or twaite shad; one American species, the *A. scepidissima*, or white shad; and one Chinese species, the *A. reevesi*. They are characterized by compressed bodies, trenchant abdomens, terminal mouths and broad submaxillaries. They are anadromous, like salmon, ascending rivers in spring, for spawning. The American shad is prized as a food-fish. It is found naturally all along the Atlantic coast, and has been propagated artificially in the larger rivers of the Gulf and Pacific coasts. Their roes are also regarded as a delicacy.

ALOYSIUS, LUIGI GONZAGA, SAINT, an Italian churchman, canonized in 1726 by Benedict XIII (calendar day, June 21st). He was born March 9, 1568, being a son of one of the most noble families in Italy. His mother imbued him with the spirit of early piety, which developed in him to a remarkable degree as he grew into manhood, his self-denial and mortification of the body, even while suffering severely under the effects of wasting disease, being conspicuous. He commenced his novitiate with the Society of Jesus at St. Andrew's, Rome, Nov. 25, 1585, and took his vows two years later. In 1591, on the outbreak of a terrible epidemic, he fell sick of the distemper and his life was despaired of; but he recovered, and fell into an ecstasy, during which he realized the approach of his own death, which occurred, as he had foretold, June 21, 1591. He was buried at the Church of the Annunciation, a rich memorial chapel being there built under his name.

ALPENA, county seat of Alpena County, northeastern Michigan, situated on the shore of Lake Huron, at the head of Thunder Bay and the mouth of Thunder River. It is on the Detroit and Mackinaw railroad, 105 miles N.E. of Alger, the junction of the railroad named with the Michigan Central, and which point is 148 miles N. and W. of Detroit. Alpena has three lines of passenger steamers. A United States fish-hatchery is located here. The harbor is an excellent one; the annual manufacture of lumber is about 130,000,000 feet. The city is the headquarters of an extensive trade in extract of hemlock. Population 1894, 12,139.

ALPHAND, JEAN CHARLES ADOLPHE, a French civil engineer, born at Grenoble, Oct. 26, 1817. Having received his training at the technical and engineering schools of Paris, and being assigned to Bordeaux, he was appointed, in 1843, engineer of bridges and highways of that neighborhood. In this position he came under the notice of the prefect, Baron Haussman, who, on his becoming prefect of the Seine, called Alphand to his assistance as engineer of the improvements of the city of Paris. This work gave Alphand full scope for the development of his genius, and to him are due those marvelous creations that transformed the old into the new Paris. After the Franco-Prussian war he was appointed by President Thiers, and also by President MacMahon, to fill the chief offices of the city's special services. No work in the city or the prefecture of the Seine could be undertaken without Alphand's approval. He exhibited great ingenuity in obliterating the traces of the siege of Paris by the Germans and the destructive work of the Commune. Having had an important share in the work of the exposition of 1878, he was chosen as the director-general of works of the exposition of 1889, with which he combined other offices connected therewith. In this year he was promoted to the Grand Cross of the Legion of Honor. He found time during his busy career to write two important works: *Les Promenades des Paris*, and *Arboretum et Fleuriste de la Ville de Paris*, which he treated in a general and interesting manner. He died Dec. 6, 1891.

ALPHARETTA, capital of Milton County, north-central Georgia, five miles N.E. of Roswell, the terminus of a short spur from the main line between Charlotte and Atlanta. Population 1890, 256.

ALPINE, capital of Brewster County, southwestern Texas, on the Southern Pacific railroad, 223 miles S. and E. of El Paso by rail, and 20 miles S.E. of Fort Davis. Population 1895, 396.

ALPINE CLUB, THE, was formed in 1857, in London, England, for the promotion of mountain-climbing, which was at first confined to a few scientists. With the gradual accumulation of knowledge, more concerted efforts were suggested, resulting in the formation of this club, its actual origination being due to William Mathews. Its first president was John Ball, who had been famed for his exploits in mountaineering, and who later published, in connection with the club, three volumes dealing with the western, central and eastern Alps. The chief social events of the club are two annual banquets, given, one during the summer and one during the winter, at the club's rooms, 23 Saville Row, London,

W. The Alps were the scene of the first determined attempts in mountaineering. Horace Benedict de Saussure had, in 1760, offered a premium for the discovery of a practicable route to the summit of Mont Blanc. This premium was secured by Jacques Balmont, a guide, who reached the long-sought point, Aug. 8, 1786, accompanied by Dr. Paccard. The following year Saussure himself accomplished the adventure, August 3d. Thus to the famous French physicist truly belongs the title of "Father of Mountaineering." See SAUSSURE, Vol. XXI, p. 324. The following is a summary of first ascents accomplished by members of the club: The Matterhorn, by Whymper (1865); the Schreckhorn, by Stephen (1861); Cotopaxi and Chimborazo, in the Andes, by Whymper (1880); Mount Cook, in New Zealand, by Greene (1882). The members of the club maintain a periodical, established in 1863, and issued quarterly, as the *Alpine Journal.* Austria, Switzerland, Italy and Germany followed the example of England by establishing Alpine clubs; and in America is the Appalachian club, whose home is in Boston.

ALPINE PLANTS, an appellation given to plants which are found at elevations above timber-line in the Alps of central Europe, or in mountainous regions in any part of the world, whose natural place of growth is near snows that are never melted. The small spaces clear of snow in the highest regions have a very characteristic flora, the plants of which are distinguished by a low, diminutive habit, and an inclination to form thick tufts; the stems are often partly or altogether woody, and their flowers are in proportion large and brilliantly colored. With these flowering plants are associated a number of delicate ferns and beautiful mosses. A remarkable similarity exists among the Alpine plants of the most widely separated regions, and also between Alpine plants and those of Arctic regions. In ascending a mountain to the region of perpetual snow the same plant-zones are traversed as those passed over in traveling from the lower latitudes to the Arctic region. It is held, therefore, that Alpine plants are but stranded Arctic plants, indicating a former very wide extension of Arctic conditions. See Arctic-Alpine and Antarctic Alpine Floras, DISTRIBUTION, Vol. VII, pp. 287–289.

ALPINUS OR ALPINI, PROSPERO. See ALPINI, Vol. I, p. 619.

ALPNACH, a village in the canton of Unterwalden, Switzerland, situated near Mount Pilatus, and some miles S.W. of Lucerne. It was famous for its wooden "slide," a trough by means of which timber cut on Mount Pilatus was transported a distance of eight miles to the edge of that portion of the lake of Lucerne called Lake Alpnach. Water was allowed to trickle continually into the trough to prevent the effects of friction. The slide is now in disuse, the timber being brought down by horses and oxen. Population, 1,679.

ALRANNEN OR ALRUNÆ, were priestesses among the ancient German tribes. The word was also applied to the diminutive images cut from wood to represent these women. The images were worshiped as household divinities, and used also as idols in the ceremonies of their religion.

ALSACE-LORRAINE. For the earlier history and the narrative of the transfer of this "Reichsland," or imperial land, from France to the German empire, see ALSACE, Vol. I, pp. 636, 637. The laws under which the country is governed were voted by the German Reichstag, June 9, 1871; June 20, 1872; June 25, 1873; May 2, 1877; July 4, 1879; and Sept. 28, 1885. By the law of June 9, 1871, it is enacted that "the provinces of Alsace and Lorraine, ceded by France in the peace preliminaries of Feb. 26, 1871, under limits definitely fixed in the treaty of peace of May 10, 1871, shall be forever united with the German empire." The constitution of the German empire was introduced in Alsace-Lorraine on Jan. 1, 1874. The administration is under a governor-general, bearing the title of "Statthalter."

The present incumbent (1896) is Prince von Hohenlohe-Langenburg, Count von Gleichen. According to the constitutional law of July 4, 1879, the emperor of Germany appoints the statthalter, who exercises power as the representative of the imperial government, having his residence at Strasburg. A ministry, composed of three departments, with a responsible secretary of state at its head, acts under the statthalter, who also is assisted by a council of state, comprising the statthalter as president, the secretary of state at the head of the ministry, the chief provincial officials, and eight to twelve other members appointed by the emperor, of whom three are presented by the landesausschuss, or provincial committee. This committee, which attends to local legislation, consists of 58 members. The Reichsland has an area of 5,601 English square miles. It is administratively divided into three bezirke, or districts, called Ober-Elsass, Unter-Elsass, and Lothringen, the first of which is subdivided into six and the other two each into eight kreise, or subdivisions. The population in 1890 was 1,603,506. The budget estimates of public revenue of Alsace-Lorraine for the year 1895–96 amounted to 50,909,323 marks, the estimates of expenditure amounting to the same sum. There was, also, an extraordinary revenue of 4,190,517 marks, and an expenditure of the same amount. More than half of the total revenue is derived from customs and indirect taxes, while one of the largest branches of expenditure is for public instruction. Alsace-Lorraine has a debt consisting of three-per-cent rentes in circulation to the amount, for the year 1894–95, of 740,286 marks. The farms support a population of 627,800, of whom 302,593 were actively engaged in agriculture. Alsace-Lorraine yields the usual cereals, and it is also a great wine-producing country. Of the 1,700 communes, 1,028 have vineyards. In 1893–94, 1,126 hectares were planted with tobacco, and yielded 2,801 metric tons of dried tobacco. The cotton manufacture is the most important in Germany; woolens are produced on a smaller scale. In 1894, minerals to the value 16,343,644 marks were raised in the Reichsland. There were 1,005 miles of railway in Alsace-Lorraine in 1894, of which 922 belonged to the state.

ALSATIA, a cant name applied to the Whitefriars district of London, adjoining the Temple, Strand, between Fleet Street and the Thames, which, on account of the existence therein of a convent of

the Carmelites (White Friars) founded in 1241, was believed to have possessed the privilege of sanctuary. The name *Alsatia* was derived from the French Alsace, which was associated in the popular mind as the seat of repeated contests, and was first applied to the district defined about 1680. The locality became so notorious that in 1697 any privileges that were supposed to have existed were abolished by law. A recent investigator asserts that no such right of sanctuary was ever possessed by the district.

AL SIRAT, literally, "the way," is an imaginary bridge as narrow as a spider's thread, believed by Mohammedans to extend between earth and paradise. In its passage, those overladen with sin fall into the abyss of Hades below.

ALSOP, RICHARD, American author, born in Middletown, Connecticut, Jan. 23, 1761. Meant for a mercantile career, he studied at Yale College, but desiring to devote himself entirely to literature, he left college before the completion of his course. He organized the "Hartford Wits," an association of active local *littérateurs* of strong Federal sympathies, who were relentless in their ridicule of all that did not meet their approval. The vehicle for these effusions was the publication called *The Echo*, which appeared, in series, from 1791 to 1795, republished in collected form in 1807. Alsop had a powerful influence on public opinion and was strongly anti-Democratic. He published, among other works, a *Monody on the Death of Washington* (1800); *The Enchanted Lake of the Fairy Morgana* (1808); *The Natural and Civil History of Chili*, a translation of an interesting work by the Italian, Juan Ignacio Molina. He died in Flushing, Long Island, Aug. 20, 1815.

ALSTER, a river in Holstein. At Hamburg it forms a lake called the Great, or Outer, Alster, which was outside the old fortifications, and within the town the Inner Alster. It flows into the Elbe. See HAMBURG, Vol. XI, p. 404.

ALSTROEMER OR ALSTRÖMER, KLAUDIUS, a Swedish naturalist and pupil-friend of the great Linnæus, who named a botanical genus (ALSTRŒMERIA, q.v.) after him. In Spain he studied the native fine-wooled sheep, and published a treatise on the subject in 1770. He died March 5, 1796, aged 60. He was a son of JONAS ALSTROEMER; q.v., Vol. I, p. 638.

ALSTRŒMERIA OR ALSTRÖMER'S LILY, a genus of *Amaryllidaceæ*, cultivated for its flowers and curious leaves. The *A. Salsilla*, a native of Peru, is cultivated in the West Indies for its tubers, which are eaten like those of the potato. A kind of arrow-root is prepared in Chile from the roots of *A. pallida* and other species. See HORTICULTURE, Vol. XII, p. 250.

ALTAMAHA, a river in Georgia, which, with its two feeders, the Ocmulgee and Oconee and their numerous affluents, drains the middle-central portion of the state as far north as Hall and Gwinnett counties. The junction of the Ocmulgee and Oconee is effected near a small town named Seward, in the southeastern corner of Montgomery County. The junction is in a direct line 85 miles N.E of Darien, the mouth of the river being 12 miles above that city. The river widens into the sound of the same name, a prominent feature of the Atlantic coast of Georgia. Below Seward the towns of Altamaha and Matlock are on its left bank and Doctor's Town on its right. In its course it flows through a rather poor section of the state as to soil, but it and its main confluents are navigable by vessels of low tonnage. See GEORGIA, Vol. X, p. 434.

ALTAMIRANO, IGNACIO MANUEL, a Mexican soldier and poet, born about 1835, in the province of Guerrero, of pure Aztec blood. He studied law and entered politics, allying himself with the extreme radical party. He fought against the French upon their invasion of Mexico and during the rule of the emperor Maximilian, reaching the rank of colonel. Retiring from active military life at the close of the war, he became a member of the constitutional congress of 1861. He was a remarkable linguist, had no equal as an orator in Mexico, and was a graceful writer of prose and verse, his novel *Clemencia* being well known. He died in Italy in February, 1893.

ALTAMONT, capital of Grundy County, central southern Tennessee. It is in the center of the county, about 13 miles N. of Tracy City, on the Nashville, Chattanooga and St. Louis railroad. Population 1890, 67.

ALTAZIMUTH, an astronomical instrument for determining the apparent places of the heavenly bodies in the celestial sphere. It consists of a horizontal and vertical circle, both graduated, the latter attached to the axis of the telescope. By it the altitude and azimuth (angle) of the heavenly body under observation is ascertained. The principal one in existence is that at Greenwich, designed by Sir George Airy. Small instruments of this kind are used in surveys. See GEODESY, Vol. X, pp. 164–171.

ALTEN, KARL AUGUST, COUNT VON, Hanoverian general, born at Burgwedel, in the vicinity of Hanover, Oct. 20, 1764; entered the army in 1781. In 1803 he went to England, where he became commander of the German legion. He was actively engaged in the Peninsular War, and also at Quatre-Bras and Waterloo. He became minister of war on his return to Hanover. He died April 20, 1840, at Bozen, Austria-Hungary.

ALTENA, a town in the district of Arnsberg, Westphalia, Prussia. It manufactures needles, pins and hardware. Population, 8,787.

ALTENESSEN, a town 2 miles N. of Essen, in Rhenish Prussia, and 21 miles N.E. of Düsseldorf. It is noted for its coal-mines, which supply the extensive iron-foundries at Essen. Population 1890, 12,295.

ALTENGAARD, a hamlet in Finmarken, the northernmost province of Norway, situated on the south side of the Alten Fiord, in 69° 55′ N. lat., 53 miles S.W. of Hammerfest. It is the most northern European point at which grain (barley) is cultivated. The only other vegetable produced is the potato. A meteorological and magnetic station is located there.

ALTENSTEIN, KARL, BARON VON, a Prussian statesman, born at Anspach, Bavaria, Oct. 7, 1770.

He is remembered in Germany as having been instrumental, in 1815, with Baron Humboldt, in securing the return of the works of art and literature which the French had carried away to Paris. He held the office of minister of public instruction and worship from 1817 to 1838. He died in Berlin, May 14, 1840.

ALTERATIVES, in medicine, is a term applied to remedies which have a tendency to alter the nutritive processes. This group includes a number of substances of diverse properties, of which the action is obscure, but the results often of great value. Among the most important alteratives are various preparations of arsenic, mercury, iodine, phosphorus, gold, cod-liver oil, colchicum, sarsaparilla,—many of them irritant poisons when taken in improper doses, but, when used in small, continuous doses, effect improvements in the nutrient and digestive functions, that are highly important in the treatment of certain eruptive troubles and glandular swellings, without causing other derangements characteristic of such drugs when taken in large doses.

ALTER EGO, meaning "another self," is a term sometimes given as a title to one who is at complete liberty to act for another. It was applied to a Spanish viceroy when exercising regal power, and was also used in other kingdoms, including France. It is now used to refer to a particularly dear friend,—a "second self."

ALTERNATOR, an electrical term applied to the apparatus by means of which the generation of alternate currents is obtained. Dynamos with such apparatus have become of special interest and importance in connection with electric lighting.

ALTERNATION OF GENERATIONS, in plants, is one of the most fundamental facts of morphology. It signifies that in the life-history of a single plant two dissimilar phases occur which alternately produce each other. A simple illustration may be taken from a moss-plant: The ordinary leafy plant bears the two sex-organs (*antheridium* and *archegonium*), each of which develops its peculiar sexual cells (*gametes*). This leafy phase, or "generation," is therefore called the *gametophyte*. When the two *gametes* fuse in the act of fertilization the result is a reproductive cell, called the *oöspore*. When this *oöspore* germinates it does not reproduce the leafy phase, or *gametophyte*, on which it was produced, but gives rise to a totally different phase, or "generation," which consists usually of a long stalk bearing a capsule full of spores. As this phase is characterized by producing no sex-organs, but producing abundant spores in a non-sexual way, it is called the *sporophyte*. When the spores of the *sporophyte* germinate they give rise to a new leafy generation, or *gametophyte*. In this way the *gametophyte* generation alternates with the *sporophyte* generation, each in turn producing the other. This alternation of generations appears in a somewhat indefinite way in *thallophytes*, but is very distinct and constant in all the higher plant-groups. The *sporophyte* and *gametophyte* are most distinct from each other, and most independent in the *bryophytes* (liverworts and mosses) and *pteridophytes* (ferns, horse-tails, and club-mosses). In the latter group the *sporophyte* becomes the leafy phase, and the *gametophyte* is reduced to the small, inconspicuous, but usually independent, phase called the *prothallium*. In the *spermophytes* (flowering plants) the *gametophyte* becomes so much reduced that it is developed in connection with the *sporophyte*, and lives upon it parasitically. The ordinary flowering plant is the *sporophyte* phase, incapable of producing sex-organs, the stamens and pistils (wrongly called "sexual") being only organs for the development of non-sexual spores (the pollen grain and embryo-sac). The *gametophytes*, developing the true sexual cells, or *gametes*, are developed by the germination of these non-sexual pollen grains and embryo-sacs, the development, however, being so feeble that the *gametophyte* from the spore known as the embryo-sac remains entirely within it; while the *gametophyte* from the pollen-spore is composed of but a cell or two, but develops the structure known as the "pollen-tube." See BIOLOGY, Vol. III, p. 687; REPRODUCTION, Vol. XX, pp. 429–431. JOHN M. COULTER.

ALTGELD, JOHN PETER, politician. He was born in Germany, Dec. 30, 1847, and came with his parents to Ohio two years later. He entered the Union army in 1864; was elected judge of the superior court of Cook County, Illinois, in 1886, and governor of the State in November, 1892, as a Democrat, his term expiring January, 1897. Governor Altgeld has published two volumes of essays on *Live Questions*, of broad views on social matters. He attracted national attention in June, 1893, by pardoning the Chicago anarchists, and again in July, 1894, by his bitter public criticism of President Cleveland for ordering out Federal troops to suppress the great railroad strike in Chicago. At the National Democratic Convention in Chicago, July 7–11, 1896, he is said to have inspired the following clause in its platform: "We denounce arbitrary interference by Federal authorities in local affairs as a violation of the constitution of the United States, and a crime against free institutions, and we especially object to government by injunction as a new and highly dangerous form of oppression, by which Federal judges, in contempt of the laws of the states and rights of citizens, become at once legislators, judges and executioners." He was defeated, Nov. 3, 1896, by John R. Tanner, the Republican nominee for governor.

ALTHÆA, a genus of plants of the family *Malvaceæ*, including the hollyhock (*Althæa rosea*) and the marsh-mallow (*Althæa officinalis*). It is a common name for the *Hibiscus Syriacus* of botanists, sometimes called Shrubby Althæa and Rose of Sharon. The genus *Althæa* is a native of the warmer parts of Europe, but it thrives well in America, and is one of the most frequent of ornamental plants. There are a great number of varieties raised by florists. It is also cultivated in Japan, where it is called "Mukinge," and is used for hedges.

ALTHEN, EHAN OR JEAN, a Persian who introduced the cultivation of madder into France. He was born in 1711, his father being a provincial governor of Persia. He was the only member of his family that escaped massacre in the revolution accomplished by Thanas-Kouli-Khan. He was captured by a roving band of Arabs and was sold

into slavery at Smyrna. He effected an escape, and, concealing some madder seeds about his person (the penalty for the exportation of which was death), he carried them with him to Marseilles. The soil and climate of Vaucluse appeared to him to suit the plant, and he experimented therein with great success, thus adding largely to the wealth of the district. Treated with neglect in after-life, he died in poverty, but was posthumously honored by the erection of a marble slab to his memory in Avignon, while his daughter was the inmate of a charitable institution. He died at Caumont, in 1774.

ALTHING, the ancient parliament or general assembly of Iceland. It was formed soon after the first settlement, when the inhabitants organized themselves into a republic and adopted one constitution for the whole island. The first althing met 930 A.D., and adopted a code of laws arranged by one Ulfljot, who, it is said, spent three years in Norway fitting himself for the task. The althing, in which all authority was vested, both legislative and judicial, met once a year, in the month of June, and was presided over by a "speaker of laws." In 1263, when Iceland was united with Norway, the althing was deprived of its legislative authority, but continued to meet as a judicial body until the year 1800, when it was abolished. It was, however, reorganized in 1843 as a parliament to consider Icelandic local interests, and in 1874 its powers were considerably increased. See ICELAND, Vol. XII, pp. 618, 621.

ALTISCOPE, an instrument having a telescopic tube and mirrors arranged so as to enable the observer to look over a parapet, wall, or other object intercepting the view. It is really a form of field-telescope which is designed to be pointed upward vertically and extended until the object-glass is above the object to be overlooked. The tube turns with a right angle at the top and with a reverse right angle at the bottom, and mirrors are inserted at these points to change the direction of vision. The principal use of the instrument is for looking over embankments during military operations, when it would be dangerous for an observer to expose himself.

ALTITUDE, in astronomy, is the height of a heavenly body above the horizon. It is measured by the angle which a line drawn from the eye to the heavenly body makes with the plane of the horizon, or by the arc of a vertical circle intercepted between the body and the horizon. The correct determination of altitudes is of great importance in problems of astronomy and navigation. See NAVIGATION, Vol. XVII, pp. 268–271.

ALTMEYER, JEAN JACQUES, a Belgian historian, was born at Luxemburg, Jan. 24, 1804, and educated at the athenæum of his native place and at the University of Louvain. He first held the position of professor of rhetoric in the college at Ypres. In 1834 he took charge of the department of history in the Free University at Brussels, and in 1837 was placed in charge of the department of political economy and commercial law in the commercial and industrial school, afterward annexed to the Royal Athenæum. The Belgian government employed him, in 1840, to make historical research in the north of Europe. After his return Dr. Altmeyer published *The Diplomatic and Commercial Relations of the Netherlands with the North of Europe in the Sixteenth Century*. The great work of his life, in which he spent 40 years, was his labor among the archives of Belgium for the purpose of publishing an exhaustive work on *The Netherlands in the Sixteenth Century*. He had published five volumes when he was compelled by failing health to desist from the work. At his death the government took possession of his manuscripts, for preservation and future publication. Among his most important works are a *Course of Philosophy of History* (1840); *Margaret of Austria: Her Life, Policy and Court* (1840); *Summary of Modern History* (1842); *The Sea-Beggars and the Capture of Brille* (1863), and *Campaigns of Louis XIV in Belgium* (1864). He died at Brussels, Sept. 15, 1877.

ALTMÜHL, a river, rising near Hornau, a village in Bavaria, flowing southeastward, and falling into the Danube after a course of 100 miles, at Kelheim, west of Ratisbon. The Altmühl constitutes part of the Ludgwigs canal, from Dietfurt to Bamberg-on-the-Regnitz (33 miles N.W. of Nuremberg), by means of which it is possible to make a passage by boat from the Black Sea to the German Ocean, and also opens communication between the Danube and the Rhine. This was first accomplished August, 1836.

ALTO, in music, is properly the same as counter-tenor, the male voice of the highest pitch. The lowest female voice is properly contralto, though in printed music the second part in a quartet is always entitled alto.

ALTO AMAZONAS, a province or state in Northern Brazil, is bounded on the north by Dutch and British Guiana and Venezuela, west by Colombia, Ecuador and Peru, south by Bolivia and the province of Matto Grasse, and east by the province of Para. In its extensive western area it is drained by the chief constituents of the river Amazon; viz., the Madeira, the Purus, the Jurua, the Javari, the Yapura, and the Rio Negro. Above Manaos, or Barrado Rio Negro, at the junction of the Rio Negro, the Amazon is called the Solimões River. The Madeira joins the main river about 150 miles below Manaos, the capital of the state. The eastern portion is also drained by numerous branches of the great river. The area of the state is 732,460 square miles, and population in 1888 was 80,654. Manaos has a population of 6,000. The state provides two deputies to the chamber, and three senators to the senate.

ALT-OFEN, a part of BUDAPEST; q.v., Vol. IV, p. 423.

ALTON, a city and port of entry on the northwestern boundary of Madison County, western Illinois, on the Mississippi River, 21 miles above St. Louis. Its situation upon the river is magnificent, and here the Burlington railroad decided to build their bridge across the river. It is the terminus of the Chicago and Alton railroad. It has increasing factories and valuable limestone-quarries. It is connected with Upper Alton by an electric railroad, at which place is located Shurtleff College, a Baptist

institution founded in 1827, with 24 instructors, and, in 1895, 201 students. Population 1890, 10,184. See ALTON, Vol. I, p. 643.

ALTON, county seat of Oregon County, southeastern Missouri, 15 miles N.E. by E. of Koshkonong, on the Kansas City, Fort Scott and Memphis railroad. Population 1895, 325.

ALTON, RICHARD, COUNT OF, an Austrian general, was born in Ireland in 1732. He was a commander in the Netherlands in 1789. Being compelled to evacuate Brussels, he died while retreating to Vienna in 1790.

ALTON BAY, a village of Belknap County, on the bay of the same name, the southeastern arm of Lake Winnipiseogee, New Hampshire, on a branch of the Boston and Maine railroad, 28 miles N.E. of Dover. It is a summer resort. Population 1895, 300.

ALTOONA, a city in Blair County, south-central Pennsylvania, at the base of the Alleghanies. It manufactures locomotives and railroad-cars. It also contains extensive hydraulic-works and an electric-car plant. Population 1890, 30,337. See ALTOONA, Vol. I, p. 643.

ALTO ORINOCO (High or Upper Orinoco), a territory in the southern portion of Venezuela, bounded on the north by Bolivia; on the northeast by the territory of Caura and that of Guiana, on the east by Brazil, on the south by the territory of Alto Amazonas, and on the west by Colombia. On all sides but the west it has natural boundaries, either rivers or mountain ranges. The surface is generally mountainous, with some wide plains and wooded tracts, the whole being drained by the branches of the Orinoco. Though exhibiting a great diversity of climate and productions, the territory is thinly peopled. See VENEZUELA, Vol. XXIV, p. 140.

ALTÖTTING. See ALTEN OETTING, Vol. I, p. 642.

ALTRANSTÄDT, a village in Saxony, noted for the treaties signed there. In 1706 Charles XII of Sweden signed a treaty with Augustus II, elector of Saxony, by which the latter lost Poland. In 1707 Charles XII signed a treaty with the emperor Joseph I, by which the Swedes and Silesian Protestants benefited.

ALTRICES is the name given to that class of birds whose young are at birth helpless and generally almost naked. It is not used in recent systems of classification.

ALTURAS, capital of Modoc County, northeastern California, on the Pit River, which falls into Goose Lake, eight miles north. Amedee, on Honey Lake, the nearest railroad point, is distant S.E. 30 miles, which is the terminus of the Nevada, California and Oregon railroad, and is 80 miles N.W. of Reno, in Nevada. Population 1890, 1,145.

ALTRUISM is the name by which is known that theoretical condition of perfection of human principle, or action toward which the benevolent aim to attain in their relations with their fellows. It means the entire subordination of self to the interests and wellbeing of others, or rather the finding of one's own highest welfare in seeking the welfare of others. The term was first used by the French positivist Comte, and adopted in Britain and elsewhere, as useful in defining the highest principle of moral action recognizable by agnostics. See METAPHYSICS, Vol. XVI, p. 101.

ALUCONIDÆ, the family of barn-owls. There are two genera, *Aluco* and *Phodilus*.

ALUDEL. See MERCURY, Vol. XVI, p. 32.

ALUMGIR. See AURUNGZEBE, Vol. III, p. 99.

ALUMINA, the most abundant of the earths, is the oxide of the metal aluminium. It is a common constituent of silicate minerals, associated with other bases. Its best-known native compound is feldspar, one of the constituents of granite, and several other kinds of volcanic rocks.

ALUMINITE. See ALUM, Vol. I, p. 645; MINERALOGY, Vol. XVI, p. 401.

ALUMINIUM OR ALUMINUM, the base of alumina. Its symbol is Al, and atomic weight 27. In nature, aluminium is not found in a separate or metallic state. It was formerly very rare, and cost as much as gold, but as a result of recent discoveries the cost has been greatly reduced. Until very late years it was imported from Greenland, being obtained from the mineral cryolite, a double fluoride of aluminium and sodium. Another source of aluminium is bauxite, originally found largely near Baux, France, and later in other localities in Europe and in the southern part of the United States. In combination with oxygen it forms the common earth alumina ($Al^2O^3$), the most abundant of the earths, as diffused over the globe in the shape of clays, loams, and similar substances. It enters largely into the composition of a great number of minerals, principal among which are the feldspars, from whose decomposition are the many forms of clay (kaolin, etc.); also a large number of silicates, as the andalusite, cyanite, fibrolite, topaz, etc. In its various compounds it is estimated that it forms fully one twelfth of the crust of the earth, and on account of its abundance, its lightness of weight, resistance to tarnish, ease in working, and its non-poisonous qualities, every effort is being made to reduce the cost of its production. It has heretofore been used, to a limited extent, by itself, and in alloys in many articles where great strength and extreme lightness were required. As a gauge of its lightness, it may be stated that a cubic foot of silver weighs four times as much, and a cubic foot of iron three times as much, as a cubic foot of aluminium, and, with its extreme ductility, and its tensile strength of 25,000 to 30,000 pounds per square inch, it is destined to occupy a highly important position in the arts.

An alloy of nine parts of copper to one of aluminium resembles gold in luster and color, and is much used in the manufacture of cheap jewelry, ornamental work, and for various industrial purposes. Three per cent of silver mixed with aluminium gives the alloy the color and brilliancy of pure silver, and while silver is tarnished by sulphureted hydrogen, the alloy remains unchanged. An alloy made of gold, silver, copper, and for soft solder a little zinc, is used in soldering bronze. It enters largely into the mechanic and ornamental arts. It

has proven especially valuable in the manufacture of fine wire lace, certain surgical instruments, suture wire, dental plates, etc., and, on account of its remarkable strength, aluminium brass has been selected by the government of the United States as the best material for the propeller-blades of the war-vessels in course of construction. It has also been found especially valuable for gun-metal, cartridge-shells, etc. It is used in boat-building, especially of racing-shells,—the racing record on the Schuylkill River having been reduced 9 seconds by boats of not more than 50 pounds' weight. It has been satisfactorily employed in the construction of sextants, transits, and other instruments of precision. Complete kitchen utensils have been manufactured from it. One of its most interesting uses is for sounding-boards for musical instruments, the sound emitted being more musical than that from wood, and also peculiarly different from that usually produced from metal.

The raw materials or ores from which aluminium is produced are bauxite and cryolite. The commercial process of obtaining the metal is by electrolytic reduction. A mixture of prepared fluorides is placed in a suitable iron bath lined with carbon. The bath is subjected to heat, and the contained mixture becomes fused. The electrodes of the bath are connected with an electric generator. On the addition of bauxite, and its dissolution within the bath, the alumina is reduced by the action of the anode current. The light metal falls to the bottom, from which it can afterward be tapped. The oxygen is liberated at the positive pole, where, if the cathode is of carbon, it escapes in the form of carbonic acid or oxide. Continual additions of alumina-containing material being made to the bath, the process of reduction can go on indefinitely. See ALUMINIUM, Vol. I, p. 647.

ALUMNUS (literally, "foster-child"), applied to a graduate of a college or university, expresses his relation to the *alma mater*, or "fostering-mother." *Alumnus* and *alumni* refer to male students, and since the free admission of ladies to colleges, the feminine forms of the word have come into use; viz., *alumna* and *alumnæ*. These sections form among themselves an increasing number of societies, which meet during the college year, and also in annual reunions. In the United States there are 28 Greek-letter college societies, having a membership of 100,000, with perhaps about 650 active chapters, and 350 inactive. The societies own 70 halls in the various college towns. The *Kappa Alpha*, which was founded at Union College, Schenectady, New York, in 1825, is the oldest fraternity. There are eleven ladies' societies, the oldest being *Pi Beta Phi*, founded in 1867, at Monmouth, Illinois. There are 16 professional fraternities, founded by professional schools attached to colleges, and these have some 50 active chapters and 350 members.

ALUM ROOT. The name is given to two plants very different from one another, but agreeing in the astringency of their roots, which are medicinally used. One of these plants (*Geranium maculatum*) contains more tannin than kino does. The other plant to which the name *alum root* is given is *Heuchera Americana*, a plant of the family *Saxifragaceæ*. They are both natives of America.

ALUM SCHIST, ALUM SLATE OR ALUM SHALE. See ALUM, Vol. I, p. 645.

ALUNITE OR ALUM-STONE. See ALUM, Vol. I, p. 645; MINERALOGY, Vol. XVI, p. 402.

ALUNOGEN OR ALUNOGENE. See ALUM, Vol. I, p. 645; MINERALOGY, Vol. XVI, p. 401.

ALURED OR ALFRED OF BEVERLEY, same as AILRED, Vol. I, p. 425.

ALUTA, a river of Austrian Transylvania and Rumania. It rises in the Carpathians, in the northern portion of Transylvania, and flows south and then east, generally parallel with this mountain range, till, reaching the Rotherthurm Pass, it enters Wallachia and Rumania, and flows in a southerly and easterly direction, joining the Danube opposite Nikopoli, after a rapid course of 300 miles.

ALVARADO, a city in Johnson County, north-central Texas. It is situated at the junction of the Missouri, Kansas and Texas, and the Gulf, Colorado and Santa Fé railroads; on the latter it is 42 miles S.W. of Dallas. It is in the center of a good corn and cotton region and has cotton gins and mills. Population 1890, 1,543.

ALVARADO, a town in the state of Vera Cruz, Mexico, situated at the mouth of the river Alvarado, which enters that portion of the Gulf of Mexico more particularly known as the Gulf of Campeche. It is on the Interoceanic railroad, southeast by east of Vera Cruz. Alvarado is a port, and can admit vessels of about 13 feet draught.

ALVARADO, ALONSO DE, a Spanish general, born in Burgos about 1490, his early history being obscure. He joined the fortunes of Cortez in 1518, participating in the conquest of Mexico. He then went to Peru and assisted in quelling an insurrection in Chachapoyas, a territory on the Upper Marañon. Recalled to relieve Cuzco, which had been seized by Almagro, with only a handful of men, he was easily defeated, but the following year, at the battle of Las Animas, April 26th, he captured his former opponent. He took part in the campaign, in 1542, against the younger Almagro, and returned to Spain, being there made a marshal. Afterward he became governor of Cuzco, also of Charcas, and captain-general of Peru. In attempting to reduce a rebellion in 1553, promoted by Giron, he was, the succeeding year, defeated May 21st, at Chuquingua. This defeat is believed to have hastened his death, which occurred soon after.

ALVARADO, JUAN BAUTISTA, governor of California from November, 1836, to December, 1842. He led the revolt against Mexican rule, which resulted in his declaring the freedom and unity of California in 1837. Alvarado was declared governor, and succeeded in winning over the southern portions of the state, which had previously held out against the movement. The Mexican government had to acknowledge his authority, but a few years later Alvarado was deposed, and lost command over his followers. It was during this time, in 1842, that Commodore Jones, of the United States navy, hoisted the American flag for the first time over Monterey.

ALVAREZ, BERNARDO D', Spanish adventurer, born in Seville in 1514. He went to Peru when a boy, where he accumulated a large fortune, which he devoted to charitable purposes. He founded the benevolent order of St. Bernardine, and established hospitals in several cities in New Spain. He died in Spain in 1584.

ALVAREZ, DIEGO D', Mexican priest, born in Guadalajara about 1750. At the age of 16 he had finished his education, and later wrote 23 volumes of manuscript on a large range of subjects, but only one of them was published. He died in 1824.

ALVAREZ, JUAN, a Mexican general, born at Concepcion de Atoyac (afterward Ciudad Alvarez), Jan. 27, 1780. He joined in the revolt of Morello, and in 1853 became governor of Guerrero. He then engaged in the revolt against Santa Anna, organizing an army, and was aided by Comonfort, and promulgated a decree still remembered as the plan of Ayutla. In July, 1855, Santa Anna was defeated, and Alvarez was declared president; but his policy, in antagonizing the army and the clergy, made him so unpopular that he resigned in favor of Comonfort, his secretary of state. He subsequently supported Juarez in the civil war, and in the war with the French, which led to the execution of Maximilian. Alvarez died Aug. 21, 1867.

ALVINCZY, JOSEPH, BARON VON BARBEREK, an Austrian general, born at Alvincz, in Transylvania, Feb. 1, 1735. He served in the Seven Years' War, attaining the rank of colonel, and rose to the rank of lieutenant field-marshal in 1789; in the same year he unsuccessfully attempted to reduce Belgrade. In 1796, he was appointed to the command in Italy, relieving General Wurmser. He entered Italy from the Tyrol, at the head of 50,000 men, and fought an indecisive battle with Napoleon, November 6th, but was defeated by the latter eleven days later at Arcola, and also at Rivoli, January 14th, following. He died at Budapest, Nov. 25, 1810.

ALVORD, BENJAMIN, an American general, born at Rutland, Vermont, Aug. 18, 1813. He graduated at West Point in 1833, and served in Florida and Texas and in the Mexican War, attaining in his service in the latter the rank of brevet major (1847). During the Civil War he became a brigadier-general of volunteers, and was gazetted brigadier-general of the United States army in 1865. He then occupied positions as paymaster, and became paymaster-general in 1876, holding this office until 1880. In the earlier part of his career, having been assistant-professor of mathematics at West Point, he devoted his leisure to the study of this subject, and published several excellent text-books, besides contributing to many journals. He died at Washington, Oct. 17, 1884.

ALVORD, HENRY ELIJAH, an American agricultural educator, born in Greenfield, Massachusetts, March 11, 1844. He entered the army as a volunteer in 1862, and passed through the successive grades to that of major in the second Massachusetts cavalry. After the war he was appointed captain of cavalry in the regular army, which position he held for several years. In 1886 he became professor of agriculture at the Massachusetts Agricultural College, Amherst, where he became famous in agricultural circles on account of his success in developing and disseminating advanced knowledge in dairying. He contributed the American sections to Professor Sheldon's *Dairy Farming*, an exhaustive British work, published in 1881.

ALVORD, THOMAS GOLD, an American politician, born in Onondaga, New York, Dec. 20, 1810. He graduated at Yale in 1828, was admitted to the bar, and in 1844 was elected to the state legislature, where he remained ten consecutive terms. He was speaker of the house in 1858, and again in 1864; and lieutenant-governor in 1865–66. In 1867 he was a member of the New York constitutional committee.

ALYATTES, a king of Lydia. See LYDIA, Vol. XV, p. 100; ARCHITECTURE, Vol. II, p. 401; PERSIA, Vol. XVIII, p. 563.

ALZATE Y RAMIREZ, JOSÉ ANTONIO, Mexican naturalist, born in Ozumba in 1729. He attained high reputation as a zoölogist and botanist, and became a corresponding member of the French and Spanish academies of science. He was one of the earliest and most careful meteorologists in Mexico, and also paved the way for the modern study of Mexican archæology. He published the *Gaceta de Literatura*, and also an essay entitled, *La limite des niéges perpetuelles en Volcan Popocatepetl.* He died in the City of Mexico, Feb. 2, 1790.

ALZEI OR ALZEY, an old Roman walled town in the grand duchy of Hesse, on the Selzbach, 19 miles S.W. of Mentz. It was sacked by the Spaniards in 1620, and by the French in 1688. It is noted more particularly as the center of the region in which the scenes of the *Nibelungen Lied* are laid. It has a trade in leather and tobacco. Population, 5,922.

ALZOG, JOHANN BAPTIST, a German Roman Catholic church historian, was born in Ohlau, in Silesia, June 29, 1808. He was ordained priest in 1834, and the next year received an appointment to the professorship of church history and exegesis in the theological seminary at Posen, in Prussia. He was made capitular of the cathedral and professor and director of the seminary at Hildesheim, in Hanover, in 1845, and in 1853 he became professor in the University of Freiburg, in Baden. His most important work is his *Universalgeschichte der Christlichen Kirche* (1840), which has reached its tenth edition, and was translated into most of the European languages. The American edition differs considerably from the original work. His *Grundriss der Kirchengeschichte* (1868) was a briefer treatise on the same subject. In 1869 he was a member of the commission on dogma which prepared the work for the Vatican. He was the solitary member of the commission who opposed the promulgation of the dogma of papal infallibility. He died at Freiburg, Feb. 28, 1878.

AMADEUS, DUKE OF AOSTA, son of Victor Emmanuel II, of Italy, born May 30, 1845. In 1870 he was invited to accept the crown of Spain, and accepted the offer, which had been tendered by the Cortes during the interregnum following the expulsion of Isabella II. His brief reign was marked by numerous insurrections and attempts to assassinate him, and on Feb. 11, 1873, he abdicated and returned to Italy. He died Jan. 17, 1890.

AMADOR DE LOS RIOS, José, a Spanish historian, born at Baena, in Andalusia, May 1, 1818. Settling in Madrid, he became professor of literature in the university of that place, devoting his study to historical as well as literary subjects. In this research he found a rich mine in Spain, where the monuments and relics of the Latins, Goths and Saracens are a constant source of interest. His chief work, which he intended to be his greatest monument, was his *Historia Crítica de la Literatura Española.* Seven volumes of this work were completed before the death of the author, but the task was too much for one man to accomplish, and he left a great deal of material behind. The incomplete work is often inaccurate; it is, however, indispensable to students of Spanish literature. Amador died at Seville, Feb. 17, 1878.

AMALARIC, the last king of the West Goths in Spain, born 501 A.D. He was the son of Alaric II, whom he succeeded in 507. He married Clotilda, daughter of Clovis, king of the Franks, in 527, and intended to make her adopt the Arian form of religion, which she refused to do. He treated her with such excessive brutality in consequence that she appealed to her brother, Childebert, king of Paris, to come to her relief. He responded, and in 531 Amalaric was defeated at the battle of Catalonia, and took refuge in a church, where he was slain, his wife returning to France with her brother.

AMALASONTHA, a queen of the East Goths. See AMALASONTHA, Vol. I, p. 651; GOTHS, Vol. X, p. 851; THEODORIC, Vol. XXIII, p. 256.

AMALTHÆA, in Greek and Roman mythology, a maiden who nourished the infant Zeus (Jupiter) on the milk of a goat. She was the daughter of Melissus, king of Crete. This story forms the basis of the myth relating to the horn of plenty, or cornucopia. The goat accidentally broke off one of its horns, which Amalthæa filled to the brim with fragrant herbs, presenting it to the god. The latter bestowed upon the horn the power of becoming filled with whatever its owner could desire, and in turn gave it to the daughters of Melissus, in gratitude to Amalthæa. Thus the cornucopia became in succeeding ages the symbol of plenty. There are variations in the story, some accounts stating that it was the goat itself that fed Jupiter.

AMAMA, SIXTINUS, a Dutch orientalist, born at Franeker, in Friesland, in 1593. He was a Protestant, and made a study of the oriental languages for the purpose of undertaking a critical examination of the Bible. In 1613 he went to England and taught Hebrew at Exeter College, Oxford, for several years. Returning home, he was appointed to the chair of Hebrew in the university of his native city, which he held until his death in 1628. His chief work was a criticism of the Vulgate.

AMANA COMMUNITY, an American German society which originated about the beginning of the 18th century, and whose chief rule is that no man should marry before he is 24 years of age. The sect is divided into three orders, according to their piety. The first grade includes all newly married people, irrespective of the grade to which they formerly may have belonged. The rules tend to discourage marriage in older couples who may have reached the highest grades. The people of the community established a reputation for their woolen stuffs, on account of their excellent quality.

AMANITA, a genus of fleshy fungi, closely allied to the common mushroom (*Agaricus*). They are mostly poisonous, and yield a poisonous principle known as amanitin.

AMAPALA, a Pacific seaport of Honduras, on the Tigre Island, which is situated in the bay of Fonesca, or Conchgua. Amapala is 800 miles from Panama by the Pacific Mail Steamship Company's route. The port is picturesquely situated and has a healthful climate. The harbor is well adapted for foreign commerce. Among the chief exports are indigo, fine woods and tobacco. Population, 1,000. See HONDURAS, Vol. XII, p. 130.

AMAR, JEAN PIERRE A., a Jacobin, born at Grenoble, France, in 1750. In 1792 he was elected to the national convention, in which he voted for the execution of Louis XVI. During the Reign of Terror Amar became notorious for his bloodthirstiness, and as chairman of the committee of *sûreté générale* he was responsible for the report which condemned so many Girondists and others to death. He also aided in the ruin of Robespierre himself. He died in Paris in 1816, a year after the restoration of the Bourbons.

AMARANTE, an interior town in the province of Minho, in northern Portugal, on the Tamego, a tributary of the Douro. The town is well built, but has fallen into decay. A church, erected in the sixteenth century, is an interesting specimen of the French Gothic style. Amarante was the scene of a fierce conflict between the French and the Portuguese during the Peninsular War in 1809. Population, 1,448.

AMARANTHACEÆ, a family of dicotyledonous plants, of wide distribution and generally "weedy" character. The flowers are inconspicuous and mostly scarious-bracted. Some of the species with the bracts bright-colored and the flowers massed are cultivated, such as some amaranths, globe-amaranth, and species of *Gomphrena*, *Iresine*, etc. They are especially valued on account of the long persistence of the brilliant heads or spikes.

AMARGOZA DESERT, a remarkable portion of the Great Basin of the West, which lies between the Wahsatch Mountains in Utah and the Sierra Nevadas in California. The Amargoza Desert comprises that portion of the region defined located in the southeastern portions of the counties of Nye in Nevada and Inyo in California, west of the Belted Range and the Bare Mountains, and east of the Panamint Range. The region within these limits includes the arms of the Amargoza Desert, to the north in Nye County, among the scattered ranges of mountains often comprehended under the same name, the Amargoza River, whose branches have their sources in the mountains. The main stream empties itself into the Amargoza "sink," at the bottom of Death Valley, in Inyo County. The channel of the river is usually dry, but at times it is a swollen torrent. Its waters then become impregnated with the salt of the desert it overflows in its rapid

course, and gathers at the bottom of Death Valley, to be evaporated by the heat of the sun, thus leaving immense deposits of salt. The bottom of the Death Valley lake is over 150 feet below the level of the sea. The torridity and aridity of the valley are not equaled in any other known region of the globe. It is most interesting from a scientific point of view. It received its name from the fact of a party of immigrants having perished in attempting, in 1849, to cross it, not knowing its dangers.

AMARI, MICHELE, an Italian historian and orientalist, was born at Palermo, July 7, 1806. He devoted himself to Sicilian history, and became famous for his investigation into the history of the Sicilian Vespers, or massacre, a masterpiece of historical criticism, which reached a ninth edition, and was translated into English by Lord Ellesmere. It was quickly prohibited, and was, consequently, widely read. The author fled to France, but the revolution of 1848 recalled him to Sicily, which had declared her independence, where he was made vice-president of the committee of war, and sent on a diplomatic mission to France and England. The restoration in 1849 made him once more an exile, but he was recalled in 1859 to fill the chair of Arabic, to the study of which he had applied himself for the purpose of writing his history of Sicily under Mussulman rule, first at Pisa and afterward at Florence. After the accession, in 1860, by the aid of Garibaldi, of Sicily to the kingdom of Italy, Amari was made a senator. He presided over the congress of orientalists at Florence in 1878. His most important works are his *Guerra del Vespro Siciliano* (1842); *Storia dei Musulmanni di Sicilia* (1853–73); *Bibliotheca Arabo-Sicilia* (1857); *Nuovi Ricordi Arabicchi sulla Storia di Genova* (1873), and *Le Epigrafi Arabiche di Sicilia* (1875). He translated into Italian Scott's *Marmion*, and the *Solwan* of Ibn Djafer from the Arabic. He died in Rome, July 16, 1889.

AMARILLO, capital of Potter County, northwestern Texas, situated in the southeastern portion of the county, on the Fort Worth and Denver railroad, 336 miles N.W. from Fort Worth. Population 1890, 482.

AMARNA, OR TEL-EL-AMARNA, an ancient city, which has been long in ruins, on the right bank of the Nile, in Middle Egypt. It was built by Amenhotep IV, who was of the eighteenth dynasty, in the sixteenth century B.C., as a seat of sun-worship. Here in 1887, some hundreds of clay tablets, bearing cuneiform inscriptions, were discovered. The language used on the tablets was Assyrian, and it is supposed that the inscriptions were made in Phœnicia and other places, proving the international use of the language in communication.

AMARYLLIDACEÆ, a family of monocotyledons, including many species, distinguished by the beauty of their flowers. There are about 650 known species, natives of tropical or subtropical, and more sparingly of temperate, regions, but particularly abundant at the Cape of Good Hope. They are herbaceous and mostly bulbous, resembling the *Liliaceæ*, but can be readily distinguished by their inferior ovary. The family includes many plants common in cultivation, as amaryllis, narcissus (including daffodils and jonquils), snowdrop, agave, etc.

AMARYLLIS, a genus of bulbous herbs of the family *Amaryllidaceæ*, containing a single species (*A. Belladonna* of South Africa), though the popular name *amaryllis* is applied to many species of other genera. The "belladonna lily," as the single, true amaryllis is called, has large bright-colored flowers (resembling lilies) upon a stout scape. See HORTICULTURE, Vol. XII, p. 265.

AMATONGALAND, same as TONGALAND; q.v., under AFRICA, in these Supplements.

AMATHUS OR AMATHUSIA, a Phœnician city in the southern part of Cyprus. Here the Greeks dedicated a temple to Aphrodite (Venus), who was hence sometimes called Amathusia. As in most parts of Cyprus, there were copper-mines in the vicinity of Amathus, which made it an object for a Phœnician colony to locate here. There are no remains of the ancient city, but its site is supposed to have been near the present Limasol.

AMATRICE, a town of southern central Italy, in the province of Aquila, among the Apennines, on the right bank of the Tronto, 21 miles N.W by W. of Aquila. It was formerly a place of considerable importance. The inhabitants are chiefly employed in agriculture and the manufacture of blankets. Population, 6,603.

AMAURY I OR AMALRIC, fourth king of Jerusalem, during the possession of the Holy City by the Crusaders. The first king was Godfrey of Bouillon, sixth Duke Godfrey of Brabant, (1099). Amaury was count of Joppa, and succeeded his brother, Baldwin III, in 1162. He invaded Egypt in 1168, was defeated by Saladin the Saracen, who continued the war by invading Palestine. Amaury died July 11, 1173.

AMAZIAH, eighth king of Judah. Born about 837 B.C., he succeeded to the throne at the age of 25 years, on the murder of his father, Joash. He was ambitious to restore his kingdom to its former greatness, and made war against the Edomites, whom he defeated, and whose capital, Sela or Petra, he took. Not contented with this success, he went against Joash, king of Israel, but he met with defeat and was taken prisoner. He retired to Lachish, where he was murdered 809 B.C.

AMAZONAS. See ALTO AMAZONAS, in these Supplements.

AMAZONAS, a department in northern Peru. It is bounded on the north by Ecuador, on the east by Loreto, on the south by Libertad and on the west by Cajamarca, these three last being departments of Peru. Amazonas is drained by the Ucayale, a great navigable river. It contains two provinces, Chachapoyas and Magnas. The surface is largely covered with forests; the area of the department is 14,129 square miles, and the population 34,245. Chachapoyas is the capital, with a population of about 6,000.

AMBALEMA, a town in the state of Tolima, in east-central Colombia, situated on the Magdalena River, 60 miles N.W. of Bogotá, the capital of the republic. It is a place of considerable commerce, chiefly in tobacco. Population, 9,731.

AMBASSADOR. Notwithstanding the impor-

tant position long occupied by the United States as one of the great powers of the world, it had been until 1893, and as stated under AMBASSADOR, Vol. I, p. 657 (q.v.), the traditional policy of the greatest of the American republics to allow its accredited representatives at foreign courts no higher rank than that of ministers. As a result, the United States occupied a position of inadequate dignity among nations which attach much importance to external symbols. Also, as international etiquette required a representative sent to Washington to be of the same rank as the one received from the United States, the persons accredited to the legations at Washington suffered a deprivation of dignity which at any of the lesser European courts they would have possessed. The long delay on the part of the United States is explicable by a persistent democratic notion that associated ambassadorial rank with monarchy. But this was an error, as the Venetian republic ages ago received and sent out ambassadors; nor did the abolition of monarchical rule by the French make any change in the rank of its diplomatic representatives. The change came in the Diplomatic and Consular Appropriation Bill of 1893, which empowered the President to raise to the rank of ambassador extraordinary and plenipotentiary the American minister accredited to any state which should previously confer a similar promotion upon its minister at Washington. In accordance with this provision, the governments of Great Britain, France, Italy and Germany speedily raised their representatives at Washington to ambassadorial rank, similar promotions being at once bestowed on the American ministers at the courts of St. James', Paris, Rome and Berlin.

AMBER OR AMBHUR, a decayed city, formerly of importance as the capital of the state of Jeypore, Rajputana, India, 40 miles N.E. of the city of Jeypore. Its temples and dwellings were distributed along the streets, which followed the ravines opening upon the contiguous lake. On one of the hills exist the ruins of a magnificent palace. The place is now entirely deserted, except for the few Hindu ascetics who frequent its tombs and ruins. Near its site is the modern Sambhur, a station on the Rajputana state railroad, which has a trade in salt from the lake in its vicinity.

AMBER-FISH, a fish of the genus *Seriola*, allied to the mackerel, found in all warm seas. Six species are known in the waters of the United States. The individual fishes vary in length from one to five feet.

AMBERG, a town in east-central Bavaria, formerly the capital of the Upper Palatinate. It is situated on the banks of the Vils, a tributary of the Naab, which flows into the Danube, 35 miles E. of Nuremberg. Its church of St. Martin's, built in 1421, has a steeple 321 feet high. The town has many important buildings and institutions; its manufactures consist chiefly of firearms, ironmongery, earthenware, woolen goods and beer. It is also the center of an important live-stock, hop and salt trade. Mining occupies the people in the vicinity. Its ancient walls have been converted into shady boulevards and gardens. Population, 19,141.

AMBIORIX, a chief of the tribe of Eburones, who inhabited ancient Gaul. He attacked the Roman troops under Sabinus and Cotta and annihilated them, 54 B.C. He was successfully resisted by Quintus Cicero (brother of the orator), and upon the arrival of Cæsar, retreated, and evaded capture by the latter, who was anxious to secure his person.

AMBITUS, literally "a going around," was a term applied by the Romans to the soliciting of votes by candidates for office. The practice seems to have been similar to what we now know as canvassing.

AMBLER, a borough in Montgomery County, Pennsylvania, 17 miles N. of Philadelphia, on the Bethlehem branch of the Philadelphia and Reading railroad. Population, 1,073.

AMBLYOPSIS, a genus of fishes, of which the blind-fish in the Mammoth Cave of Kentucky is a typical representative. Their eyes are often mentioned as examples of the effect of disuse upon organs. They are present, but are covered by skin.

AMBLYSTOMA, an extensive genus of tailed amphibians (*Urodela*). They are notable for the remarkable life-histories of some members of the group. A formerly recognized genus, *Siredon*, or *Axolotl*, is now known to be the larval stage of species of *Amblystoma*. In its native home, Mexico, the axolotl reproduces in the larval condition, and never becomes a fully developed *Amblystoma* unless taken to a different climate. See SIREDON, Vol. XXII, p. 96.

AMBO, a desk or pulpit common in early Christian churches. It was placed in the choir, and from it the gospels and epistles were read, and sometimes sermons preached. It is still used in Eastern churches, and examples of it may even yet be found in Rome. It has one ascent from the east and one from the west, by steps. Roman churches had two ambos, one on each side of the choir, the gospels being read from one and the epistles from the other.

AMBOISE, GEORGE D', cardinal, and prime minister to Louis XII of France, was born at Chaumont in 1460. In his fourteenth year he became bishop of Montauban, and in 1493 archbishop of Rouen. Five years later he was made prime minister, and in the same year was made cardinal. His ambition was to succeed Pope Alexander VI. For this purpose he instigated a schism in the church, continued his intrigues for some years, but he was unsuccessful, and his hopes finally vanished upon the reverses sustained by the French troops in Italy. He was popular in France on account of his remitting many of the imposts levied upon the people by former rulers. He accumulated a vast fortune of 11,000,000 livres, and died May 25, 1510.

AMBOY, a town in Lee County, northwestern Illinois. It is situated at the junction of the Illinois Central and Chicago, Burlington and Quincy railroads, near the Green River. It is 95 miles W. of Chicago. At Amboy are railroad-shops of the Illinois Central railway. Population 1890, 2,257.

AMBRIZ, the northern division of the Portuguese territory of Angola, West Africa, extending from the Congo to the River Ambriz, or Loge. The town of Ambriz is situated at the mouth of the river of that name.

AMBROS, AUGUST WILHELM, a Bohemian pianist,

born at Mauth, Nov. 17, 1816, and became noted as a musical composer, critic and historian. His *Geschichte der Musik*, the first part of which appeared in 1862 and the last in 1868, placed him in the front rank as an authority on the history of European music, the work dealing with the subject from the time of ancient Greece to modern times. He died in Vienna, June 28, 1876.

AMBROSIUS, JOHANNA, a German poetess, born at Lengwethen, a small village in East Prussia, of a peasant family. Her education ceased when she was 11 years of age, after which she was obliged to attend to all the household duties. The father was naturally fond of reading, but was able to indulge in the luxury of but one illustrated weekly journal. The duties of the young poetess enfeebled her strength and she became weakly. But she persisted; and although to her household work was added labor on the threshing-floor and in the stable, yet after dark she found time to exercise her poetic instinct, and set down her inspiration in verse. These came accidentally under the notice of Carl Schrattenthal, who assisted her in bringing out a volume of poems that has been the talk of Continental critics, and has brought the lowly poet fame. When 20 years of age she married a peasant named Voight, a son and daughter being born to them. Notwithstanding the adverse circumstances under which this gifted poetess was born and reared, she seems intuitively to have exercised a broad and humane understanding. Without culture, the muse found a congenial and virgin soil in her mind. She has attained a foremost place among her contemporaries in literature.

AMBROTYPE, in photography, a thin negative serving as a positive picture in which the light is represented by the silver portions left on the back of the glass, the shadow being produced by the black background, visible through the unsilvered portions. The ambrotype was much used during the period between the copper-plate daguerreotype and the paper photograph.

AMBULACRAL SYSTEM, a name sometimes applied to the water-vascular system of the echinoderms. See ECHINODERMATA, Vol. VII, p. 633.

AMBULANCE ASSOCIATION, ST. JOHN, a humane British organization established in 1877 by the Duke of Manchester and the Chapter of the order of St. John of Jerusalem, London, for the purpose of disseminating general information as to the preliminary treatment of the sick and injured among all classes of society. A course of instruction is given to students. Those who pass the examination receive a certificate of proficiency. Women who have passed the first examination are allowed to attend a second course in home-nursing and hygiene. Nearly 300,000 certificates have been awarded to persons of both sexes. An invalid transport corps has also been formed. On public occasions, as at the wedding of the Duke and Duchess of York, when over 1,500 cases were treated in London alone, ambulance stations are formed by the various corps of the "St. John Ambulance Brigade," and "first aid" is rendered in all cases of injuries from accidents and of sudden illness. The work has been extended to the Indies, Canada, China, Australia, New Zealand, and different parts of Europe and Africa.

The use of ambulances in cities of the United States is not as general as in European cities, nor is the system in the excellent condition to be found there. Each city is a law unto itself in the matter of the regulation and control of the ambulance service in this country, some having it conducted by the police department, some by the hospitals, others by the health department, and still others combining the different managements, as does Chicago. In the latter city there are six wagons under the management of the police department, and three under the health department, first introduced in 1890. These nine ambulances do no work, other than to respond to calls to assist sick, injured, insane or other persons unable to help themselves. The sick or injured are taken either to their homes or to a hospital, as the circumstances may require, and are treated *en route*, when treatment is necessary. The ambulances are fitted with a cot, bandages, ligatures, medicine-case, rubber pillows, blankets, sunstroke caps, etc. Each wagon has a driver and two trained attendants, who render the required aid in all emergency cases immediately on reaching the person upon whom they are called to attend. In addition to this force of nine wagons, there are about fifty patrol-wagons, used by the police to respond to calls for help in effecting arrests, and to convey prisoners to the different police-stations. All of these wagons are fitted as are the regular ambulances, and are manned by the same trained force of officers.

As showing the nature and amount of work performed by the ambulances of a large city, the following figures have been secured from the police department of Chicago: During the year the number of alarms responded to varied from 354 to 557 per month; the number of miles traveled, from 3,034 to 3,821 per month; sick and injured to hospital, from 227 to 492 per month; sick and injured to home, from 33 to 88 per month; sick and injured to station, and cared for, from 1 to 9 per month; insane persons cared for, from none to 11 per month; the number of destitute persons cared for during the year, 29; arrests made, from 9 to 29 per month; the number of fires attended during the year, 53; dead bodies taken to the morgue during the year, 31; sick and injured to residences during the year, 13; persons taken to jail during the year, 6; abandoned children taken to Foundling's Home during the year, 2; wayward girls taken to Home of Good Shepherd during the year, 2; destitute persons to Home of Friendless during the year, 8; destitute persons sent to county agent's home office during the year, 16. Causeless alarms varied from 2 to 38 per month, and miscellaneous calls from 16 to 43 per month.

The service in New York is under the management of the hospitals of the city, the territory being divided among the different institutions, each of which maintains a wagon, as well as trained nurses to go with it on call. In Boston the service is under police control, but in the other cities of the Union it is generally managed by the health department.

AMELIA OR AMERIA, a town in Umbria, central Italy, southeast of Spoleto, and a few miles north of the junction of the Nera with the Tiber. Amelia has a cathedral, and occupies the site of the ancient Roman town, one of the earliest founded in Umbria. The ancient Amelia district was famous for its vineyards.

AMELIA, capital of Amelia County, in southern Virginia. It is situated on the Southern railroad, 36 miles S.E. of Richmond, and about 6 miles W. of the Appomattox. Population 1895, 380.

AMELIA ISLAND, part of the county of Nassau, on the northeastern coast of Florida. It is separated from the mainland by a channel from two to four miles wide, and is about four miles wide and sixteen miles long. Towards its northern extremity is the city of Fernandina. At the northern point of the island is the Amelia Island lighthouse.

AMÉLIE-LES-BAINS, a health-resort in the department of the Pyrénées-Orientales, on the Mediterranean coast, southern France. It is about 20 miles S.W. of Perpignan, and 3 miles W. of Ceret, a railway station. It is famous for its sulphurous saline baths, and is the resort of many sufferers from chronic troubles. Its name was formerly Arles-les-Bains, the change to its present form having been made in 1840, in honor of Louis Philippe's wife. See PYRÉNÉES, Vol. XX, p. 128; MINERAL WATERS, Vol. XVI, p. 435.

AMEN, a Hebrew word equivalent to "yea," "truly," commonly adopted in forms of Christian worship. According to the catechism of the English Church, it signifies, at the conclusion of prayer, "So be it"; after the repetition of the creed, "*So is it.*" In the Roman Catholic version of the New Testament, Amen is substituted for the "verily" of the authorized version.

AMENDE-HONORABLE (Fr. "honorable compensation") was, in France, in the ninth century, a public confession made by traitors, parricides and other culprits in court, after having had various indignities inflicted upon them by the executioner. The phrase survives in modern usage, being applied to a willing and open apology, sufficient to atone for the wounded honor of another.

AMENDMENT, in judicial proceedings, is the correction of an error committed in the progress of a cause. The term is also applied to the writing or instrument filed in the cause for the purpose of making the correction. Under modern statutes governing judicial practice, amendments are very liberally allowed in formal matters, and even when the amendment goes to the substance of the controversy; but if the amendment is substantial, the party making it is frequently required to pay the costs which have accrued. Amendments are permitted in criminal as well as in civil cases. The general modern rule is, that all amendments will be allowed which are necessary for the purpose of determining the questions in controversy and administering justice. The liberal practice in allowing amendments has tended to lessen the strictness of the common-law rules of pleading and practice.

AMENIA OR AMENIAVILLE, a village of Dutchess County, southeastern New York. It is situated on the New York Central and Hudson River railroad, 84 miles N. of New York City. In its vicinity are productive iron-mines. It is the seat of the Amenia Seminary. Population 1895, 967.

AMENHOTEP, a name borne by four Egyptian kings of the eighteenth dynasty. See EGYPT, Vol. VII, pp. 737, 738.

AMENTACEÆ, a name formerly applied to what was considered a single large family of dicotyledonous trees, their flowers being arranged in "aments," or "catkins." Later botanists, however, have broken up the group into several families, such as *Betulaceæ* (alders), *Fagaceæ* (beeches and oaks), *Juglandaceæ* (walnuts and hickories), *Salicaceæ* (willows). In consequence, the form of the name has been changed to *Amentales*, to indicate its higher rank as a term of classification.

AMENTHES, in Egyptian mythology, the unseen world,—literally, the "hiding"-place. The soul, escaping from the body by the mouth, in the form of a bird, was conducted by the god Anubis, or his aids, to the judgment-seat of Osiris, where its deeds were weighed. It was from the Egyptian Amenthes that the Greeks obtained the conception of their Hades.

AMERBACH, BONIFACE, a Swiss scholar; born at Basel in 1495, the son of JOHANN AMERBACH (q.v.). He was a teacher of civil law in the university of his native place for 20 years. He enjoyed the particular friendship of Erasmus whose residuary legatee he became. For his father, with the aid of his two brothers, he revised an edition of St. Jerome's works. He died in 1562.

AMERBACH, JOHANN, a celebrated printer, was born at Reutlingen, Swabia, 1443. He removed to Basel, Switzerland, about 1480, where he published magnificent and carefully prepared editions of the works of St. Augustine and St. Ambrose, in which he was the first to use, instead of Gothic, what is now called Roman, or as it was then called, St. Augustine, type. He intended to print an edition of St. Jerome's works, but he did not live to see its accomplishment. In this edition he was aided by his sons, who completed the work after the death of their father, which occurred at Basel, Dec. 25, 1513. See TYPOGRAPHY, Vol. XXIII, p. 695.

AMERCEMENT OR AMERCIAMENT is a punishment imposed by the court, having the character of a fine. It has long remained in disuse, but in some of the states a sheriff may be amerced for acting contrary to a statute.

AMERIA. See AMELIA, in these Supplements.

AMERICA. This name designates the Western Continent and its adjacent islands, forming the main body of land found in the Western Hemisphere. America has an area of about 14,796,988 square miles, and occupies about 150 degrees of longitude and 135 degrees of latitude. Population, 121,728,784,—a population of 8.2 per square mile. See AMERICA, Vol. I, p. 669.

AMERICA, BRITISH, a former name for what is now called the Dominion of Canada, together with Newfoundland and Labrador. In a wider sense it includes the islands and colonies of America which belong to Great Britain.

AMERICA, RUSSIAN, a name once applied to what is now known as Alaska, including the Aleutian Islands. This region was purchased by the United States from Russia, in 1867, for $7,200,000. It was occupied by the Russians for more than a century, and the language, religion and manners of the natives bear the distinct impress of their former masters.

AMERICA, SPANISH, at present includes only the islands of Cuba and Porto Rico, with their dependencies. In a wider sense the term is frequently applied to all those parts of America where the Spanish language is commonly spoken by the people. In this sense it would also include the South and Central American republics and Mexico.

AMERICAN ACADEMY was founded in 1889 for the promotion of the study of political and social science. It has a membership of 2,500, distributed throughout the United States and 34 foreign countries. The annual meeting of the academy is held in January. The academy was founded without regard to party, for the especial purpose of extending the study of such science in universities. Among its more noted initiators were Professor Edmund J. James, Ph.D., now of the University of Chicago, and present president of the academy; Henry C. Lea, of Philadelphia; Professor Woodrow Wilson, of Princeton; and John Quincy Adams, Ph.D., of Boston, who acts as general secretary.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. The association has a membership of 1,812, from which number are elected the fellows, who choose the officers. The association is organized into nine alphabetical sections, embracing mathematics and astronomy, physics, chemistry, mechanical science, geology and geography, zoölogy, botany, anthropology, and economic science and statistics. Each of these is presided over by some prominent scientist, who is a vice-president. The association publishes a volume of entitled *Transactions* yearly. The office of the permanent secretary (F. W. Putnam) is located in Salem, Massachusetts. See SOCIETIES, Vol. XXII, p. 223.

AMERICAN BIBLE SOCIETY. See BIBLE SOCIETIES, Vol. III, p. 650; and in these Supplements.

AMERICAN BLIGHT, a disease of fruit-trees, caused by an aphid or other insect which interferes with the nourishment of the various parts of the trees; as, for instance, the apple-bark plant-louse, or woolly aphis, which forms a cottony film or ball in the leaves of apple trees that have been neglected.

AMERICAN ECLECTIC SCHOOL OF MEDICINE, as its name implies, professes to adopt in practice whatever remedy can be proved to possess curative properties, and to modify in its practice any method that fresh discovery may prove erroneous or susceptible of improvement. Its teachings seek to inculcate the necessity of conserving the vitality of the patient; and in surgery, of preserving as much as possible of the injured portion of the body as is consistent with the patient's chances for recovery. The first college of this school was established in New York City, by Dr. Wooster Beach, in 1826. Dr. Philander Chase, bishop of Ohio, in the mean time had secured a charter for a reformed medical school at Worthington, that state; and subsequently, in connection therewith, a combination between the two faculties was effected, resulting finally in the removal of the Worthington college to Cincinnati in 1843. This college was incorporated in 1845, under the title of the Eclectic Medical Institute. The transfer and broadening of the scope of the college had been effected chiefly through the efforts of Professor Thomas Vaughn Morrow, of the original New York faculty of the college, and he continued until his death to be the ruling spirit in its councils. Colleges were established in the principal cities of the Northwest, and the practice continued to gain in favor. The national organization had ceased to exist, but in 1870 it was revived as the National Eclectic Medical Association, under the auspices of the various existing state organizations, the new association becoming soon after incorporated.

The following is a list of Eclectic Schools of Medicine in the United States: California Medical College, San Francisco; Georgia College of Eclectic Medicine and Surgery, Atlanta; Bennett College of Eclectic Medicine and Surgery, Chicago, Illinois; Eclectic College of Physicians and Surgeons, Indianapolis, Indiana; Iowa Eclectic Medical College, Des Moines; American Medical College, St. Louis, Missouri; Medical Department of Cotner University, Lincoln, Nebraska; Eclectic Medical College of the City of New York; American Eclectic Medical College, Cincinnati, Ohio; Eclectic Medical Institute, Cincinnati, Ohio. The total value of the buildings and grounds of these colleges is $284,500.

AMERICAN FEDERATION OF LABOR was organized at Columbus, Ohio, in December, 1886, under the presidency of Samuel Gompers. About eighty national labor organizations, composed of about 7,000 trade unions, having a total membership of over 650,000, are affiliated under the general title. In important matters of policy the action of the federation is general and united, although independence of action is reserved to the individual unions. This is the distinctive feature of the federation, which also differentiates it from the organization known as the Knights of Labor, the latter fostering the idea of central control. The objects of the federation are for the general amelioration of the condition of the laborer, the securing of shorter hours and better remuneration, the prevention of hastily planned strikes, the protection of children under 14 years of age from labor, the equalization of men's and women's wages. See LABOR ORGANIZATIONS, in these Supplements.

AMERICAN FORESTRY ASSOCIATION. See FORESTRY, in these Supplements.

AMERICAN INDIANS. See INDIANS, Vol. XII, p. 822.

AMERICAN INSTITUTE was organized in New York City in 1828, and received its charter the next year as the American Institute of the City of New York, its objects being to promote domestic industries within the state, and generally throughout the

entire country, to encourage agriculture, manufactures, arts and commerce. William Few was its first president. It accomplished these objects by holding annual fairs; the first being held in 1828, in Masonic Hall, opposite the New York Hospital. Fairs have been also held in Niblo's Garden, at Castle Garden, and other places, since. From 1838 to 1859 exhibitions of live-stock were held, those of 1857 and 1858 being for fat-stock alone. At these fairs the exhibits are classified into the following groups: Fine Arts and Education; the Dwelling; the Dress and Handicraft; Chemistry and Mineralogy; Engines and Machinery; Intercommunication; and Agriculture and Horticulture. The members are also benefited by their attendance at the monthly meeting of the various sections, comprising the Farmers' Club, the Polytechnic, the Photographic, and the Electrical. Recent discoveries are discussed at these meetings and recent inventions are exhibited at the fairs, it being a boast that many of the greatest modern industrial inventions have been exhibited for the first time publicly at these annual meetings.

AMERICAN INSTITUTE OF CIVICS. See CIVICS, in these Supplements.

AMERICANISMS have been defined as "certain modes of expression which are, or which are supposed to be, peculiar to the United States, in distinction to English usage." But not a few of these so-called "Americanisms" are really good old English words, which, in the land of their birth, have lost their original significance, while it has been retained here. Another class consists of words that have been coined to express new ideas or describe new processes existing only in the Western World, to which class, necessary and increasing, the name *Americanese* might be given. Americanisms, of course, are more noticeable in speech than in books; and in the best American writers it is difficult to detect anything of the sort, except when introduced intentionally. While it is undoubtedly true that many words which were once slang have in course of time become part of our legitimate vocabulary, yet it is the province of the lexicographer to say when they shall be so included. Some are simply vulgarisms, and will always remain such, yet others are in the borderland between coarseness and purity of speech. It must be confessed, however, that the line between American slang and "Americanisms" is oftentimes very faint. A few examples must suffice and the first of these is the extent to which, in the United States, the nautical term *aboard* has extended its meaning to land affairs is quite amusing. Travelers by rail are urged to *go aboard the cars*, as railway carriages are called, the conductor finally crying out, "*All aboard!*" *Baggage-car* and *luggage-van* are the synonymous terms in vogue, respectively, on American and English railroads. Similarly, what we call "baggage" the English term "luggage." —The significance borne by the word *bee* in the United States constitutes a pure Americanism. The new settler generally built his log cabin without help, but when he proposed to erect a house or barn he had a "raisin'," as the setting up of the timbers was called. All the neighbors gave their aid, calling it a "building-bee," or a "raising-bee." In like manner we find the phrases, *chopping-bee*, *husking-bee*, *quilting-bee*, and even *spelling-bee*. The bee-hunter has enriched us with the phrase, *to strike a bee-line*, which is a synonym for the other Americanism, *air-line*,—equivalent to the English, *as the crow flies*. An energetic pursuit, or rapid, direct course toward a certain goal, is called "making a bee-line" for that point.—In Virginia, crown grants were commonly "blazed out," or "blazoned," by cutting some marks in the bark of a tree. The word *blaze* (from the French *blason*) has grown into an Americanism, but it can be traced into old English editions of the Bible. A newcomer "blazes out" his pre-emption right on the tree trunks, or he "deadens" the tree for the same purpose by belting or "ringing," it—i. e., cutting off a circular piece of bark, so as to prevent the sap from rising.—*Blizzard* is a modern American word, probably more or less onomatopœic. As applied to a bitter snowstorm, the word became general in the American newspapers during the severe winter of 1880–81; but, according to the Milwaukee *Republican* of March 4, 1881, it had been so applied in the *Northern Vindicator*, of Esherville, Illinois, between 1860 and 1870.—Some of the great American railroads use various-colored envelopes for different branches of their business. On some of these a blue envelope contains a notice of dismissal; hence, the use of the phrase *to get the blue envelope* signifies the loss of one's employment. A yellow envelope is sometimes used.—The most plausible explanation of the common term *bogus*, meaning "counterfeit," or "fraudulent," is, that the assumed name of a remarkably successful swindler, *Borghese*, was in course of time not only reduced to "bogus," but finally applied to everything false and fraudulent. It spread rapidly over the whole Union, and is now one of the most familiar of Americanisms.—*Bonanza* is a Spanish term of similar meaning to placer. It is a nautical word, and means fair weather at sea. If the reader will refer to Matt. viii 26, he will read that after the Lord rebuked the wind and the sea, "there was a great calms" and if reference is next had to the Spanish version of the New Testament, he will find the phrase there given, "una grande bonanza." It is easy to understand how the word came into its figurative use as meaning a happy calm and good hope after a weary search.—The word *boss* is derived from the Dutch *baas*. Originally used in its primitive meaning of master or overseer, it became customary to speak of a "boss tailor," or a "boss carpenter,"—meaning a mechanic who employed several *hands*, or workmen. Soon the word became widely popular. It has even been turned into a verb; and "to *boss* a job" is a common expression for undertaking a business. The word, harmless in itself, has passed into politics, and become part of the history of the nation. The head of a party, the manager of an intrigue, the patron of a bill in Congress, each is called the "boss." The term is current from the Gulf of St. Lawrence to the Gulf of Mexico, from the Narrows to the Golden Gate.—In the South, the house and stable servants were universally called "boys," no matter what their

age. From this arose the custom of dubbing the male help in American hotels "boys," as bell-boy, waiter-boy, though they may be gray-haired men.—Among his own race in the far South, the negro still clings to the term *buckra*, imported from the west coast of Africa, and originally meaning a spirit or powerful being, and then, by a natural transition, white man. In his new home he used it to designate anything specially good, as the *buckra yam*, which, to deserve the epithet, must be white and good at the same time. It is not likely that the term *bushwhacker* is a pure Americanism; though it is hardly known in England, it is heard in Australia and South Africa. Originally used to designate the process of propelling a boat by pulling the bushes on the banks of the stream, it became afterward a name for lawless persons and fugitives from justice who took refuge in the bush.—The American minister who wishes to find a field of usefulness waits for a *call*, or invitation, from a congregation to come and minister to their spiritual wants. When it is accepted, he is "settled," and receives a "stated salary."—The English "election contest" becomes in America a "political campaign."—*Chores* is a pure Americanism, naming collectively the hundred and one odd jobs that need daily attendance about the house or farm; but it is evidently connected with the word *charwoman*.—When a stream of water is suddenly hemmed in between high and narrow banks, and thereby forced to reach a lower level with more or less velocity, such a place is termed a "chute." In mining parlance, too, the name is given to an artificial stream of water confined within narrow limits.—*Clever* is one of the most cruelly ill-treated Americanisms. It has assumed two very different meanings,—designating in the North a good-natured, obliging person, while at the South it means gifted and talented. The American pet word *smart* has, however, largely superseded it.—*Corn*, in Britain, is grain; in America it is applied to *maize*.—The use of *delightful* for *delicious* in such a sentence as "The ice-cream is delightful," is very common in the Southern states.—The word *digging* has become familiar to English ears, from its use in the gold-mines of Australia. There it generally denotes only a place where precious metals are dug for, but as an Americanism it serves to designate any special locality.—The "drummer"—so named, it is supposed, from his habit of traveling about the country to solicit or drum up custom—is, in the United States, the equivalent of the "bag-man," or "commercial traveler," of Great Britain.—The word *dry-goods* is universally used in the United States for the wares known in England as linendrapery" or "haberdashery." Dry-goods for men's use are called "men's furnishings."—*To dump*, in the sense of tilting a cart, and thus unloading it, is an Americanism; and open lots, where "rubbish may be shot," as is said in England, are in America called "dumping-grounds."—The expert who handles the throttle of an English locomotive is called the "engine-driver,"—a wise distinction, as compared with our American use of the term *engineer*, which confounds men of vastly different callings.—An *elevator*, in America, is called a *lift* in Britain.—*Expect* is the equivalent in the Middle states for the New England "guess."—The "fireman" of American locomotives and steamships becomes the "stoker" on similar English conveyances.—"*To fix*," says a writer, "may be said to be the American word of words, since there is probably no action of the mind or body which is not at some time or other represented by this word." Whatever is to be made, whatever needs repair, whatever requires arrangement,—all is "fixed." The President *fixes* his cabinet, the mechanic his work-bench, and the seamstress her sewing-machine; and the young lady *fixes up* at her toilet. And yet "fix" may mean trouble and embarrassment. The New York *Herald* speaks of President Arthur being in a *fix;* and a young lady hesitating between two suitors is also in a painful *fix*. *Fixings* naturally abound, also, and denote wellnigh everything, from the railway "fixings" of a new branch to the "chicken-fixings" of the West and the South.—The meaning given to the word *fizzle* in the United States constitutes an Americanism. The old-fashioned musket would frequently refuse to explode, the priming in the pan going off with a fizzling sound. Hence the word *fizzle* signifies any ridiculous failure after great expectations had been aroused.—Articles shipped by railway are called "freight" in America, and "goods" in England. Thus we have the American "freight train" and the English "goods trains," or "luggage train."—The English never speak of matter sent by ship as "freight," but use the term *cargo* or *lading*.—The pointed iron plates placed where two lines of railroad part are called "points" in England; in the United States they are called "frogs," resembling the marks on a horse's-hoof.—The apparently contrary expressions, *gone up*, *gone under*, stand for one and the same thing, in Western parlance,—i.e., to fall to "go to smash," or even to die. The first may be supposed to be drawn from the sudden elevation attending an explosion; the second probably arose from the fate of some luckless pioneer who was drawn under the rapids of a river.—*Fall* is the name applied to what in Britain is known as the *autumn*.—*Grit* and *clear grit* are pure Americanisms, standing for pluck, or energy, or industry, or all three. Reference is probably had to the sandstones used for grindstones,—the more "grit" they contain, the better they wear.—"*Guess*," says a recent authority, "is probably, of all words in the dictionary, the most thoroughly abused and the most passionately discussed." Quoted by almost every writer on America as one of the most obtrusive Americanisms, there is ample evidence that the word has been used in England from time immemorial in the precise sense in which the Yankee uses it now. *Gulch* is really a restored Old English word meaning a dry watercourse or gully, and, contrary to general belief, has no connection with the Spanish.—To "fly off the handle" is to lose one's temper, or in the case of a lady, to jilt her lover. The phrase has a backwoods flavor, and probably arose from the great value of the trusty ax to the hardy pioneer: when the head flew off the handle, the tool was useless.—The word *help* was probably coined to avoid the use of the word *servant* in this "land of the free." *Hired man* and *hired girl*

are two other terms used in the United States with the same end in view.—Americans say a girl is "homely" when they mean she possesses plain features, and thus a word denoting a woman's most lovable quality is perverted into a term of reproach.—*Honey-fugling* is a genuine Americanism, meaning to cheat or to defraud one's creditors.—*Horn* is another name for a dram or "drink" of liquor.—The term *jack-knife* has been supposed to be derived from "jack-a-legs," which, as a name for a clasp-knife, has a queer history. In New England we call, to-day, a particular kind of cutting-implement a jack-knife.—"Horses boarded" is a common sign over a livery-stable in America.—*Jersey lightning* is a colloquial term for the apple-jack sold in the state of New Jersey. It is popularly supposed to be extraordinarily rapid in its intoxicating effect.—A common Southernism is the use of "like as if," or "like," for the words *as if*. "She looked like she knew me," is a common expression; or, "She looked like as if she 'd die." This is very common in Washington, and in all the States south of Mason and Dixon's line.—*Lot* is a word which, in its application to land, is unknown to England, but universal in the United States. A *cemetery lot* is another appropriation of the word.—In the United States, *lumber* means manufactured timber. In Britain it means unused household goods, etc.; hence a "lumber-room" for what an American housewife would call a "storeroom," Hence, also, we have the term "lumber-yard" for the English "timber-yard," and the "lumber camp" for a colony of tree-fellers, who are said to be engaged in "lumbering," and are called "lumbermen."—*Mad*, in the sense of angry, and as a substitute for the English *wild*, has been recognized as excellent Old English. Captain John Smith says: "This made him halfe madde." Even the familiar phrase, *like mad*," has old and high authority.—The negro nurse of Southern white children was called "mammy," and generally sounded *mawmer*. This last has invaded the North as the too frequent substitute for "mamma," among white children.—*Meat-market* is the American butcher-shop. In Louisiana the word *metif* denotes the child of a white man and a quadroon.—*Muss* is a colloquial word meaning to throw into confusion, to muddle, to litter. As a noun, it signifies rubbish, dirt, etc. A third meaning makes it do duty for a fight, a fracas or a quarrel.—*Notion*, in the sense of small, trifling wares, is probably the word which, of all Americanisms, is regarded as the most absolutely American, both in origin and in usage. "Yankee notions" and a "notion store" are phrases known the world over. But so grave and didactic a poet as Young, than whom none could be less American, used it nearly one hundred and fifty years ago exactly in the sense in which it is now used in New England.—In the days of the petroleum excitement in Pennsylvania the finding of oil meant fortune to the lucky prospector. Hence the phrase, *struck oil*, passed into current speech to signify sudden riches.—An American speaks of his "people," meaning his immediate kindred, where an Englishman would say "relations." The word *folk* is similarly used.—*Picayune* indicates something small, mean or contemptible. The picayune is a Carib coin, worth six and a quarter cents.—*Pie-plant* is an American name for rhubarb.—The miner or the merchant who has grown rich is said to have "made his pile,"—a phrase imported from the camp of the gold-hunter.—"If a man asks for the milk-jug," says R. G. White, "be sure that he is British-bred; if for the milk-pitcher, be equally sure that he is American."—*Placer*, an American mining-term of Spanish origin, meaning at first simply "pleasure" at coming unawares to a rich gold-mine, has become familiar, and now means not only the drift-sand which contains gold, but any good thing which promises a liberal return of profit. Among colloquial terms derived from commerce, none are more frequently heard than "posting" and "posted." The terms arise, of course, from accounts which, when fully entered on the ledger, are said to be "posted." As Americanisms, however, they are used to express full knowledge of any subject. A would-be farmer thus says: "I require much 'posting' [information] before I can begin"; and a scholar of various learning is reputed to be "posted" on all grave questions.—The *pound-party* is a variation of the surprise-party, in which every person participating is supposed or expected to contribute a pound of something to the general stock. Frequently the unopened packages are auctioned off for the benefit of some charity.—Among Southerners *pretty* is a word very often misused; for instance, "Is n't this a pretty day?" and this error is a very general one. North Carolinians say the scenery is "pretty,"—meaning picturesque; the day is "pretty,"—meaning fine; and that a person's manners are "pretty,"—meaning well-bred. The *railroad*, as Americans uniformly say, instead of *railway*, as in England, has brought with it a number of terms peculiar to the New World. The English "station" becomes a "depot"; the "trucks" of the Old World are called freight-cars, and there are "palace-cars," and even "silver palace-cars." The "rails" of American railroads are the "metals" of English lines.—*To raise*, applied in England only to vegetables and animals, is used in America also in reference to men. Nothing is more common than the question, "Where were you raised?"—The *ranch* was the farm of the Spaniard in Mexico, and the *ranchero* was the farmer himself. In the great West, the term *ranch* indicates the home of the stock-raiser.—The word *rapids* is peculiar to New World English, and serves to indicate the difference between a rapid descent or a series of descents in a river and a waterfall, or cascade.—The Southern equivalent for the "guess" of New England and the "expect" of the Middle states is "reckon."—*Right away*, used for *straightway*, excited the wrath and ridicule of Dickens on his first visit to Boston. Now the phrase is heard all over the Union, and has made its way to England also. If we happen to hear any body say "*rye cheer*" we may know it is intended to mean "right here." For instance, a South Carolinian will say, "He stayed *rye cheer* with me."—*Right smart* is a pet Southern phrase, where one often hears of a "right smart lawyer," or "a right smart preacher."—In the Southern states the word "rock" means a pebble or a stone. By saying "he 's got

the rocks," we mean he is rich.—*Rubbed out* is a Western euphemism for death.—Very expressive of American haste and hurry is the comparatively modern use of "to run," in the sense of to manage or to keep, when applied to any kind of business, from a gigantic hotel to a petty grocery. "Who *runs* this business now?" means "Who is the manager?"—*Salt* and *salting* are Western Americanisms. In the parlance of the mining camp, to "salt" a worthless mine is to secretly place or scatter therein samples of rich ore for the purpose of effecting a sale. The rich ore is the "salt," and the practice is known as "salting a mine."—A liquor-saloon, supposed to embody the fiction that patrons enter only to "sample" or try the beverages within. This, and the kindred term "shades," is probably an outgrowth of the temperance agitation, which sought to render drinking vulgar in "bar-rooms" and "saloons."—*Sand* is an Americanism, whose first meaning is the same as "grit." A man with "sand in his craw" is supposed to be very plucky. In New England "garden sass" means any kind of small vegetables.—"One of the few French words which have become naturalized in American speech is the *chantier*, thoroughly adopted in the shape of *shanty*. Originally used by *voyageurs* and Canadian immigrants, it is universally employed to designate a slight wooden shed or shelter."—*Shebang* is the name of a college student's sanctum, of a low drinking-den, and of a cheap theater or variety show. The word is thought to be a corruption of the French *cabane*, and is common throughout the United States. The outer covering of the spike or fruit of the maize is the *shuck*. This name is peculiar to the South. In the Western and Northern states the equivalent term is "husk." So a certain rural gathering is, in the South, a "shucking-bee," and in the other localities named a "husking-bee."—*Sick*, applied in England solely to nausea, is in America used for any kind of indisposition.—*Sink-holes* are abrupt indentations in the soil, from the bottom of which mineral springs frequently issue.—*Skedaddle* is an Americanism which obtained currency during the Civil War, and signifying precipitous flight.—*Slip* has acquired a new meaning in its new home. It means an opening between two wharves or in a dock; hence many localities in the city of New York bear such names as "Peck Slip."—*Small potatoes* is applied to anything or anybody small, mean or petty. The complete phrase is, "Small potatoes, and few in a hill."—To "smile" is the Americanism, once immensely popular from Maine to California, used to denote the act of drinking liquor. "Let 's smile" was a universally understood formula.—*Snuffed out* is a California euphemism for death.—The humorous son of the West speaks of the discontented settler as a man who has "soured" on his "section." The jilted lover "sours" on his former flame, and to lose money by the failure of a bank has "soured" the stockholders.—The *stoop*, as designating the place between the steps leading up to the house and the door, is a genuine Americanism due to the Dutch, for the burghers loved to sit on their *stoeps* (seats) smoking their pipes. Now *stoop* is the name for any covered or open porch in front of a house.—*Store* is the universal equivalent for the English "shop." A *drug-store* in America is called a chemist's shop in Britain.—In a country newly reclaimed from the forest, tree-stumps remain for years a conspicuous feature of the landscape. Such often formed a convenient platform for political speakers, and hence "to take the stump," or to "stump the country," signifies a traveling from place to place, speaking and canvassing for votes. Such a man is known as a "stump speaker."—In the Northern states and in Canada, a gathering in the maple grove for the purpose of making sugar, which is obtained from syrup drained by "tapping" the sugar-maple, is a "sugar camp." A grove of sugar-maple trees is called a "sugar orchard" in the Northern states and Canada.—A social gathering, in which the family visited is not forewarned, being therefore "surprised," and on which account visitors bring their own refreshments, is called a "surprise party."—The Americans "switch" a train, where their English cousins speak of "shunting" one. The "switchman" or "switch-tender" of American railroads is the "pointsman" of English roads.—The law against the game of ninepins having been evaded by the addition of the tenth pin, the man who bowled over the whole number was said to make a "ten-strike," so the phrase "to make a ten-strike" passed into current phraseology to indicate a lucky stroke.—The word *timber* is used throughout the West for any woodland or forest growth. Hence "to take to the timber" is to hide in the forest. The phrase "Presidential timber" is also used of men considered available for that high office. As none but the tallest and straightest trees are selected by the woodman's ax, so only the most eminent men are likely to be talked of for the highest office in the gift of the people.—*Tonsorial artist* and *tonsorial parlor* are American barbers and hair-dressers and their establishments.—Our American custom of calling the prong of a fork a "tine" is a Lincolnshire peculiarity, and came over with our fathers. The more general word, *prong*, is, indeed, driving it out, and the word *tine* is understood in Lincolnshire alone.—"To get to go" is essentially a Georgia expression. They say, "Don't fail to come to-night"; and the reply is, "I've tried 'to get to go' three weeks now, so I *reckon* I'll be there t' night."—The expression "Do don't" is heard in Georgia and South Carolina, but rarely elsewhere.—The road-bed of a railroad, which we name the "track," is called the "line" in England.—The practice, common to hunted game, of seeking refuge in the branches of a tree, led to the phrase "to tree" one's self, or "to tree" game. In an opossum-chase the dogs often mistake the tree up which the creature has sought safety, and are then said to be "barking up the wrong tree,"—a phrase which has come to be applied to similar blunders in real life. The phrase "up a tree," meaning "in a predicament," is also of the same origin.—Kitchen-garden produce in America is known as "truck." "garden truck," or "garden sass." Another meaning of the Americanism "truck" is its equivalent use for the English words, *lumber*, *litter* or *rubbish*, of any sort. The vehicle known as a "truck"

in the cities of the United States is the "van" or the "dray" of the English.—As strange a perversion of a word as can be found in the long list of Americanisms is the use of the word *ugly* for "ill-tempered" or "angry."—Throughout the middle states, especially in the rural portion, the "vandoo" signifies an auction sale of goods and chattels. It is, of course, a corruption of *vendue*.—Like the term *crevasse* the word *washout* also signifies a break in an embankment; but while a crevasse has reference to a river dike, a washout applies more especially to a railway embankment, and also to the dropping out of the bottom of a canal.—*You all*, or as it should be abbreviated, *y' all*, is one of the most ridiculous of all the Southernisms we can call to mind. It usually means two or more persons, but is sometimes used when only one person is meant. For instance, a caller, on taking her departure, says, "Y'all must come to see us." She means that the lady upon whom she is calling and her husband may call.

AMERICANIST, a term applied to one who is devoted to the study of America in its relations, particularly to man, as of the aborigines and archæology of the country. It may be applied to a student of any foreign country who interests himself prominently in such subjects.

AMERICAN LEGION OF HONOR. See BENEFIT SOCIETIES, in these Supplements.

*AMERICAN LITERATURE. (See Vol. I, pp. 718–735 for an earlier account of this subject.) It is becoming more manifest with every year that the rise of the brilliant school of authors headed by Irving, Cooper, Emerson, Hawthorne, Longfellow, Whittier, Holmes, Motley and Lowell marked the opening of a sharply defined epoch in the history of American literature. The movement arose during the second quarter of the century, as a result of certain well-defined conditions. It culminated during the decade preceding the Civil War, from which point it slowly ebbed, until long before the opening of the last quarter of the century its circle was complete. Ever since the death of Irving in 1859 the members of the group have been falling out one by one, until the death of Mrs. Stowe in 1896 removed the last prominent figure. The period has now faded far enough into the past to allow it to be seen in its true proportions. It was a well-rounded, sharply defined epoch,—the foundation-time, the first great literary creative period in America,—a period which may worthily be compared with the corresponding one in England.

In the mean time there has opened a new era in American civil and intellectual history. The problems that were solved by the war of 1861–65 were indeed of vital importance, since they had dominated political thought since the foundation of the government. With their complete solution the nation took on a new life. The Union had passed through its test of fire and had survived unbroken. A new spirit took possession of the North and the South alike. No sooner was the work of reconstruction complete than both together turned eagerly to the work of building up the war-impoverished nation. A new South full of wonderful promise arose from the ashes of the old. The great West, which at the time of the war was swarming with buffaloes and Indians, and almost unknown to the whites, was opened to settlers. A railroad was pushed across the continent to the Pacific, and numerous lines were built into every part of the nation. Immigrants in almost inconceivable numbers poured through the Eastern seaboard cities into the new lands. In twenty-five years the population of the United States had nearly doubled. New England and the Middle States were almost transformed by the thousands of foreigners who had settled within their borders. It was a time of expansion, of intellectual activity, of rapid development. "Few quarter-centuries in the world's life so bristle with salient events."

The spirit of the times has reacted upon the literary product. It has been a time of great literary activity, of expansion and diffusion. A new group of writers has appeared, surprising in its numbers and most remarkable in the vastness and variety of its literary product. It has arisen as the result of no concerted intellectual movement; it has had no common ideal to bind its products into a unity; it has not yet produced a writer who can be compared with the leaders of the older school. It has been a time of diffusion, rather than of concentration of effort. Writers have been content to produce in rapid succession a large number of works of average merit, rather than a few of supreme excellence, the results of slow and careful work. The Americans are a nation of readers, and the amount of literary food daily required is enormous. Literary talent has become exceedingly valuable. It no longer pays to spend a lifetime on a few classics. Until the appearance of the new group, American literature had been confined almost wholly to New England and New York, but it soon spread rapidly into the South and the West, until now there are but few states without literary centers and prominent literary workers.

POETRY. From the high position which it held during the middle years of the century, poetry has of late fallen in popular estimation to the second, and perhaps even to the third, place among literary products. The novel, the short story and the rapid, gossipy sketch of life and manners are in eager demand, but poetry from contemporary hands falls, with a few exceptions, almost unnoticed from the press. But, despite this fact, there has been no dearth of poets. Never has there been a time when so many could write really excellent verse. Very many of the younger novelists and other prose-writers began their careers with volumes of poems, while the older members of the group, like Taylor, Stoddard, Stedman, Aldrich, Howells, Helen Hunt Jackson and Bret Harte, the most of whom began to write before poetry had been displaced in popular regard by prose fiction, won as poets their first and brightest laurels with work that has given them a secure literary place only a little lower than that occupied by the masters of the older school. The poetry of the period has been bound together by no dominating idea, no common chord. It has been to a large degree sporadic in its production and diffusive in its tendencies. It can best be classified in

*Copyright, 1896, by The Werner Company.

four groups, corresponding to the geographical range of its production.

1. *The New York Group.* Until the opening of the present period, American poetry seemed almost exclusively a New England product. Poe alone during the creative period had represented the middle states and the South. New York proudly claimed the Knickerbocker group, yet Bryant and Halleck and Willis were only adopted sons. The first group of poets to produce significant work outside the New England environment was the little band that gathered in New York City about Bayard Taylor and started the movement that was to become so powerful an influence on American literature during the period succeeding the Civil War. Taylor had come to New York from a rural Pennsylvania hamlet as early as 1844, and after two years afoot in Europe, had settled down to work on the *Tribune* and other journals, varied by frequent tours into many lands. It was during the early days of his literary apprenticeship that he came in contact with Richard H. Stoddard, a young iron-worker of Massachusetts birth, and the result was a rare friendship of lifelong duration. The two young poets had much in common Both had come from humble homes, and had early been thrown, with little education, upon their own resources. In their attic rooms, during the few hours of each week allowed them by their work, they discussed their enthusiasms and ideals. Seldom have two poets been more perfect complements of each other. Taylor, full of physical life and action, loved passionately material nature, the beauties of sense, of color, of form, of harmony; Stoddard lived more in a spiritual world; imaginative beauty appealed to him with more power than material. Without this friendship the art of both poets would have been incomplete. The little group of two was soon joined by others,—by the brilliant Irish poet and novelist, Fitz James O'Brien, and later by Stedman and Aldrich. The three Pennsylvania poets, Read, Boker, and Leland, may be counted as members of the group, and Walt Whitman, who came nearest to being a native of the city, was a member of the circle, though far removed from it in spirit. This group of poets, which has approached nearer to the coherency of a school than has any other of recent years, has influenced, more or less, nearly all later American song. Its literary product may be described as poetry of culture. Its dominating characteristic has been its fastidious observance of the rules of lyric art; its subjects, with few exceptions, have been of a trivial nature; few of its poems have been marked by strong, original genius. It has been content to cut perfect cameos rather than chisel heroic marbles. Taylor was easily the master of the school. He had made good his lack of early culture by wide contact with the world. With a soul exceedingly sensitive to mere sensuous beauty, he caught, as few occidentals ever have, the fire and passion of the far East. His *Poems of the Orient* are strong and spontaneous, and upon them and his early lyrics and home idyls, inspired by love and memory, his fame will chiefly depend. Stoddard's early master was Keats. A passion for the beautiful, the ideally beautiful, has dominated his song. He is the most artistic, the most imaginative, of the group. Many of his lyrics are heart-songs that will chord with human life as long as it has sorrows and aspirations. Stedman's best poems are idyls and ballads. He has sung well of artificial life; he has constructed idyls even of the teeming metropolis. Of late years he has turned to literary criticism, and with two or three scholarly and charming books has won for himself a place in this difficult field second only to that occupied by Lowell. Aldrich leads the group as a delicate workman. He is a western Herrick; his best poems are tiny brilliants polished with exquisite skill. The younger writers of the metropolis, like R. W. Gilder, Edgar Fawcett, and H. C. Bunner, have all been members of this artistic school. Walt Whitman with his lawless lines stands as the very antipodes of the group.

2. *The New England Group.* The strong poets of the creative period, who made New England so long the literary center, left no successors. Singers there have been in abundance, but none who could lift the lyre of the elder minstrels. The later chorus has been largely soprano. Woman has everywhere come into literary prominence during the last quarter-century, but nowhere so conspicuously as in New England. Her province has been a restricted one. The short sketch or novel of domestic life and manners, and the lyric of moods, of impressions made by objects of beauty, have been her chief domain, but within these limits she has done surpassingly well. The leading poet of the period, and perhaps the leading female poet of America, was Helen Hunt Jackson, whose intense lyrics, often rapt and mystical, the outburst of bereavement and suffering, early won the approval of Emerson, and gained for her a secure place among American poets. She had no large creative genius; she attempted nothing ambitious: she simply poured into the sonnet and other lyric forms the fullness of her heart. In her last years she turned to prose, and with a single powerful novel, the most powerful, save *Uncle Tom's Cabin*, ever written by an American woman, she entered the most select circle of novelists. Among others of a notable group may be mentioned Lucy Larcom, whose songs, full of a sweet femininity and a rare religious trust, will not soon be forgotten; and Celia Thaxter, the poet of the Isles of Shoals, who caught, as no other singer has, the echoes and odors of the northern ocean. Of male voices the most prominent have been those of John Townsend Trowbridge, whose *Vagabonds* and poems in the Yankee dialect have won for him a secure place; John Boyle O'Reilly, the brilliant Irish poet, and James Jeffrey Roche, the singer of sprightly "ballads of blue water." *The Atlantic Monthly*, the center of literary New England, has attracted for varying periods into the Boston orbit such strong poets as Aldrich, and Howells, and Harte, whose influence has been at times very marked; but altogether the period in New England has been unimportant,—a time of minor singers and minor songs.

3. *The South.* During the first creative period of American literature, when the firmament of New England was aglow with its brilliant constellation

of poets, novelists and historians, the South, save for a few scattered lights, was lying in the shadow. New England had been literary from the first; everything in her history and her physical environment had tended toward this end, but the South had grown in a different direction. The lines of divergence between the two sections can be traced back to the very beginnings in America. The almost feudal system of society in the old South was the result largely of physical conditions. The rich lands of Virginia were found to be admirably suited to the cultivation of tobacco, a product eagerly bought by English merchants. In order to win profits of any magnitude, it was soon evident that large farms must be cultivated. As the soil became exhausted, new fields were cleared, until the plantations became extremely large. The introduction of slavery made it easy to maintain these vast estates. The numerous rivers were navigable for miles from the sea-coast, and these made natural highways between the plantations, rendering the small trade-center, so prominent in New England history, unnecessary. In later years, when the invention of Whitney's gin made cotton a valuable product, the plantation system was extended throughout the South. Society was at once divided into three sharply defined castes,— the plantation-owner, who within his limit was almost a king, the poor white, and the negro slave. The two lower classes were inevitably illiterate. There was no centralized society, as in the North, where agriculture was confined to narrow, rocky fields, and where the church had been the cause and center of every community. Literature flourishes only in a centralized society, where there is a constant interchange of ideas and of books, and almost every factor in the old South tended toward a scattered society. The large county became the political unit, whereas in the North it was the small town. The management of vast estates produced men who were intensely practical, who had neither time nor inclination to pursue the dreamy art of poesy. They were men of action, men of affairs, leaders of men, accustomed from infancy to lead and not be led. Thus, while the old South produced few literary men, it nevertheless furnished to the nation some of its most wonderful leaders.

The past quarter-century has witnessed the transformation of the South. The war, by setting free the slaves, destroyed forever the old plantation system. It precipitated new problems in abundance. It has been a period of transition, of the establishing of new landmarks, of the readjusting of old ideals. In literature the new South has already taken a significant place. There has been but little poetry of late. The almost tropic imagination of the South, with its long training in the school of action, has turned most naturally to the dramatic novel. In this domain lies the literary promise of the South. The old days, almost feudal in their institutions, have faded into the past, until now they lie in the haze of romance. There is a wonderful background awaiting the future Southern novelist and poet. "The war, the freed slaves, the old *régime*,—courtly, unchanged, impatient, helpless"; "the new generation, bold, aggressive, vigorous, irreverent, daring, its enterprises stupendous, its ambition boundless."

Of the later poets of the South only two need be considered: Paul Hamilton Hayne and Sidney Lanier. Hayne was the leader of the little group that tried to make of Charleston, South Carolina, a literary center in the decade preceding the war. Assisted by William Gilmore Simms, the prolific novelist, by Henry Timrod, a true poet, who died too early to win the place he deserved, and by others, Hayne had founded, in Charleston, *Russell's Magazine*, a periodical modeled after *Blackwood's*, but it had died a natural death, and the war soon scattered the little group. Hayne belonged in spirit to the artistic school of lyrists. His sonnets are faultless. His best songs echo the hopes and fears of his own region, the courage and the heroism of the war, the pathos of the lone South. In Sidney Lanier the South produced its truest poet since Poe. In a way, he stands alone among American singers. He was an innovator almost as much as was Whitman. Music was to him the supreme art, and poetry was but a variety of music. "In all cases," he declared, "the appeal is to the ear"; but the ear, as in music, must be educated to appreciate the higher forms. With these ideals he set out to make symphonies of words, to combine meters and verbal harmonies into cantatas and oratorios. His best work in this direction, like *The Hymns of the Marshes* and *Corn*, shows a wonderful command of poetic technique and much true poetic feeling, but they can hardly be said to prove his theory. His minor lyrics, like *The Song of the Chattahoochee* and *The Mocking Bird*, are full of rare melody.

4. *The West.* It is only within the present period that the West has made any significant contributions to American literature. It is hard to realize as one looks over the well-tilled farms and flourishing cities of the great central states, that within the memories of men now living all the region was lying on the remote frontier. For all the region west of the Alleghanies the past seventy-five years has been a pioneer period, with almost the same conditions that confronted the settlers on the Eastern seaboard two centuries before. It has been a struggle of man against the forces of wild nature; a war bare-handed with the elements. In the far West it is still in progress. There has been little time for literature, or indeed for anything save hard physical toil. Even after nature had been subdued and life had begun to flow in gentler channels, there was still little chance for literary art. Everything was new. Society settles into its ultimate forms but slowly; individuality, the life-blood of literature, comes only with time.

Naturally the first lispings of Western song came from the regions earliest settled,—from the Ohio valley and the middle West. The earliest singers were the Cary sisters, Alice and Phœbe, natives of Ohio. As early as 1850 they had attracted the attention of Whittier, who immediately secured for them a wide audience. Later they removed to New York City, where their home during the last years of their life became the center of all that was purest and best in American literature. As poets they had no strong, original message; their songs were chiefly

ballads, lyrics of sentiment, and hymns, sweet and feminine, full of the freshness of childlike natures. Other members of the Ohio valley group were John J. Piatt and William D. Howells, who published in a joint volume their early verses; Edward Eggleston, the novelist; Mrs. Piatt, whose thoughtful lyrics are full of "a vivid consciousness of the mystery of life and death"; John Hay, whose rollicking *Pike County Ballads* have a perennial charm; James Whitcomb Riley, "the Hoosier poet"; and Edith M. Thomas. All of these, with the single exception of Riley, made haste to leave the valley with the first approach of fame; many have turned into literary fields far remote from those of their first choice; yet all have sung faithfully and well of their native soil. Aside from the single exception of the Ohio valley poets, there has been no distinctly Western group of writers. There have been, however, many scattered voices, some of them of rare compass. Bret Harte and Joaquin Miller have sung of the wild life of the California mines, and Will Carleton has made ballads of Michigan farm-life. Eugene Field, the Chicago poet, wrote much sparkling prose and songs in many keys, but his most charming work is his poems of child-life. It is as yet too early to expect much literary fruitage from the West, but the promise for the future is not uncertain.

Prose Fiction. The literary characteristic that most sharply defines the period since the Civil War has been the wonderful developments in the field of prose fiction. Novels, romances, short stories, prose sketches and studies now make up almost the entire intellectual diet of the majority of the reading public. Book-stores and news-stands fairly groan under their loads of fiction. The causes of this remarkable literary condition are not easily enumerated. Many factors have entered the problem; many results have, as yet, no explanation. The leading causes seem to have come from the new spirit of materialism and criticism that has been characteristic of the era. A large leisure class has sprung up; ease of communication with the Old World has brought cosmopolitan ideas; America has outgrown her youth, and is now questioning her traditions. Idyllic verse no longer satisfies; there must be brawnier food. The speed and tension of modern life demand action rather than dreams. The dramatic novel, intense and vivid; the short story, compact, nervous, rapid; the realistic sketch, remorselessly accurate, material for studies in social and moral science,—these alone can satisfy. For some tastes a pinch of spice must be added.

In the fiction of the period three sharply defined movements may be noted: the rise of so-called "realism," the development of what may be termed "literature of the soil," and the perfection of the short story.

1. *Realism.* The element of realism, as introduced into American fiction by Henry James and William Dean Howells, is one phase of the great movement that has so profoundly affected all modern literature. With James and Howells a novel is "a picture of the actual, of the characteristic,—a study of human types and passions, of the evolution of personal relations." Nothing is idealized; life is studied in the cold light of scientific truth. The novelist must ever be in "an attitude of watching life, waiting upon it, and trying to catch it in the fact." There must be no dreams, no castles in the clouds, no mystery skillfully led up to a climax, no impossible hero and heroine to go through cycles of adventure. The reader is shown a photograph of life, a minute analysis of all its parts, "a complete natural history, as it were, of a group of persons collected in a complicated relationship," and he must draw his own conclusions. "A novel," says Howells, "is a picture in which the truth of life is suffered to do its unsermonized office for conduct." To him there is no such thing as genius. The novelist's eye never rolls in a fine frenzy, any more than does that of the anatomist. The novel must deal with ordinary people and commonplace events; it must be passionless, cold, clean-cut, classical.

James has chosen his "groups" for study from a field that he has made peculiarly his own. His novels are "international episodes." Although an American by birth and early training, he has passed so much of his life abroad that he is admirably fitted for international comparisons. On the whole, he has treated his field impartially. In novels like *The American* and *Daisy Miller* he has shown Americans against a European background, while in others like *The Europeans* and *An International Episode* he has reversed the case. James's novels have come from the intellect, more than from the heart. His workmanship is refined and subtle; his technique, even to the finest touches, is perfect; his literary style is polished and brilliant; but his novels lack the element of human sympathy, and lacking this, they can never take a permanent hold upon their readers. Howells, on the other hand, with all of James's lightness of touch and grace of style, is alive with sympathy. There is in all his work a frankness, a humanity, a sunny cheerfulness, that could have come only from a heart kind and pure. His best novels, like *The Rise of Silas Lapham* and *A Modern Instance*, are studies of American life in the middle and lower strata. His realism, like that of James, is pure. He has never, as have so many of the European school, explored the gutters of life. Not a line in all the works of both masters need bring a blush to the most sensitive of readers. Howells's skill and delicacy of manipulation, and his genuine humor, are nowhere better seen than in his parlor comedies, like *The Mouse-Trap* and *The Elevator*,—bubbles lighter than air, yet thoroughly delightful in their perfect art.

Although the school of purely realistic novelists has been a comparatively small one, the element of realism has had an important influence upon nearly all later fiction. The study of provincial dialects, of peculiar types, and of environments, has been the most marked characteristic of the period, and much of this "literature of the soil," as it may be called, has been realistic in its tendency. But nearly all of the later novelists have idealized more or less the real, or in the words of James, have mingled "a delicate manifestation of the real with an occasionally frank appeal to the romantic muse."

2. *Literature of the Soil.* Before 1870 American

fiction, save as it dealt with incidents and backgrounds drawn from early history and from real scenes, was largely colorless. Irving had reflected the new soil in some of his most charming sketches, and Cooper had displayed his idealized frontiersmen and Indians against a carefully studied background, but there had been little attempt to draw minutely accurate pictures of real life and its surroundings. Europeans have always demanded that American literature shall "smack of the soil,"—shall be distinctively American in atmosphere, color and scene. This conception, false as it is, has borne abundant fruit. Cooper won tumultuous applause from foreign critics, chiefly on account of the strangeness of his materials, but the pure gold of his mine was quickly exhausted, as his numerous followers soon discovered, and it was not until the appearance of Bret Harte, with his wild tales of the California gulches, that this applause was repeated. The almost sensational success of these tales marks an epoch in the history of our fiction. During the decade following 1870 nearly every peculiar people within the limits of the Union came prominently before the reading public. Edward Eggleston, with his rare powers of characterization, portrayed the life of the early settlers in Indiana; Mark Twain told with irresistible humor of rough life on the Western frontiers and on the Mississippi; Constance Fenimore Woolson drew conscientious pictures of life along the coasts of Florida and Georgia; Miss Jewett began loving sketches of her native Berwick; Cable wrote the first of his powerful Creole tales of the Louisiana bayous, and Joel Chandler Harris published his first studies of the Georgia negro. Since then Miss Murfree has explored the unknown fastnesses of the Tennessee Mountains; Alice French (Octave Thanet) has scoured the canebrakes of Arkansas; Thomas Nelson Page has studied the Virginia negro; H. S. Edwards and Richard M. Johnston have added to the echoes of the Georgia plantations; Hamlin Garland has explored the sod houses of the Dakotas, and Mary Hallock Foote has drawn graphic pictures of the Colorado and Idaho frontiers. American literature has overflowed with studies of provincial life, of environments and types peculiarly American, until every section that has any individuality at all has now its chronicler.

New England, since it has a marked individuality and a great diversity of character, has received most careful attention. Its peculiar richness as a field for studies of character was recognized long before the popularity of the new movement had driven novelists to seek for fresh and unexplored domains. J. T. Trowbridge, with *Neighbor Jackwood* and *Coupon Bonds*, novels full of sparkling humor and characterization, had early shown the richness of the field, and Mrs. Stowe, after writing the two powerful anti-slavery novels on which her fame chiefly rests, had turned to her native soil to do her most careful work. Her *Oldtown Folks* and *Sam Lawson*, in their faithfulness to nature and their cheerful, gentle spirit, are worthy of comparison with the best studies of Jane Austen and Maria Edgeworth. Nearly all of the later students of New England life have been women. The work of Rose Terry Cooke, Jane G. Austin, Harriet Prescott Spofford, Elizabeth Stuart Phelps, Sarah Orne Jewett and Mary E. Wilkins has been especially strong. With a few exceptions the group has been at its best in short sketches, or at the longest, novelettes. Their canvas, from the very nature of the conditions, has been small, but by patience and careful study they have drawn exquisite miniatures, as perfect in their way as Flemish pictures. The novels of Elizabeth Stuart Phelps, perhaps the leader of the group, are intense and earnest. Many of them, like *The Story of Avis* and *A Singular Life*, deal with living themes, with the great problems of life, in a light-bringing way, while others, like *Jack the Fisherman*, are prose idyls, charming in their perfect art. Miss Jewett's pleasing sketches, which deal with rural life along the Maine coast, have a naturalness and a fidelity to detail that makes them worthy of careful study. Her scenes and characters stand clean-cut and distinct; it is impossible to forget them. They seem like parts of our own past lives, like chapters from our own memories. This fidelity to nature, joined to a graceful humor and a limpid prose style, makes her sketches wellnigh faultless.

Outside of New England the four figures that stand out most prominently are Bret Harte, Mark Twain, George W. Cable, and Mary N. Murfree. Like that of nearly all of the school, Harte's best work lies in his short stories and sketches. Since his first work, he has written most voluminously, sometimes issuing three volumes in a year; but he has never equaled his first half-dozen sketches, poured from the freshness of his first impressions. As Lowell wrote of Cooper,

> "One wild flower he 's plucked that is wet with the dew
> Of this fresh western world, and, the thing not to mince,
> He 's done naught but copy it ill ever since."

His strength lies in the strangeness of his materials, the vividness of his scenes, the swift condensation that paints a picture in a few strokes, and the pathos and the humor that glow on every page of his work. Power for sustained effort, for the development, step by step, of a human soul, he certainly lacks. His pictures are flash-light photographs, poses caught when a brilliant ray lights for an instant the darkness of a wicked life.

In Mark Twain (Samuel L. Clemens) we have a strong individuality, with keen perception of the incongruous joined to accurate powers of observation and a fine poetic sense. He began his literary career in that most dangerous *rôle*, a popular humorist. His fun was boisterous and typical, full of the American elements of exaggeration and irreverence, and the public, even to the present day, has largely overlooked the fact that there is anything else in his books. But Mark Twain's humor is only one of the many elements that contribute to his literary strength, and even without it, rare as it often is, his books would have no ordinary value. His descriptions, sometimes even approaching the realms of poetry, his accurate characterizations, his powers of minute observation and of narration, his facility and his sense of proportion, give them their truest value. His most sarcastic wit has ever been leveled against shams and hypocrisy. *Innocents Abroad* laughed

away much of the silly affectation and guide-book enthusiasm of American tourists in Europe, and very little of his other humor has been mere bundles of nonsense written with no object save to create a momentary laugh. His later works have been growing more and more serious, and it is more than probable that the critics of the future will rank him as a strong and intensely original writer who was incidentally a humorist.

George W. Cable and Mary N. Murfree (Charles Egbert Craddock) have added to our literary domain regions as strange as were Harte's California mines. The Creoles of New Orleans, and the dwellers in the swamp regions of Louisiana, were unknown to the reading public until Cable laid bare their lives and described their peculiar environment. His *Grandissimes*, *Madame Delphine* and *Dr. Sevier*, aside from the freshness of their backgrounds and characters, are powerful novels, perhaps the most powerful in recent American fiction. He knows his field by heart, he conceives character strongly and paints it graphically, and he deals with problems that are fundamental in all human experience. What Cable has done for Louisiana, Miss Murfree has done for the Great Smoky Mountains of Tennessee. Her novels are largely studies, wonderful pictures of ragged peaks and dark ravines, in the foreground of which move strange figures of men and women as wild and elemental as the mountains themselves. Her strength lies in her descriptions of nature and in the picturesque reality of her characterizations.

It is as yet too early to estimate the real strength of this literary movement, or to predict confidently in what light it will be viewed in the future. Its value, however, in widening the range of American literature, both as to producers and products, cannot be disputed. On the whole, it seems to offer little of promise. The surface mines must be exhausted in time, and there will be no new fields for pre-emption.

3. *The Short Story.* The short story is perhaps the literary form in which Americans have achieved their greatest success. It seems singularly adapted to the American mind. Irving, Hawthorne and Poe did with it some of their most charming work, while during the past quarter-century it has been brought to such a degree of perfection that it is now generally recognized as the one literary department where America leads the world. That the period has been pre-eminently one of short stories has been the result of a distinct demand. It has been a time of rapid expansion, or extraordinary activity. The masses have had little leisure for voluminous fiction. The business man, if he reads at all, must have rapid, sparkling sketches that will furnish the maximum of entertainment in the minimum of time. There has been no distinct school of writers of this shorter fiction. Nearly all novelists of the period, including, with scarce an exception, the members of the preceding group, have done some of their best work in this literary form. A representative collection of recent short stories would contain such perfect works of art as Hale's *The Man Without a Country*, Stockton's *The Lady or the Tiger?* Aldrich's *Marjorie Daw*, O'Brien's *The Diamond Lens*, Mrs. Spofford's *The Amber Gods*, Mark Twain's *The Jumping Frog*, and Page's *Marse Chan.*

Two novelists have belonged almost exclusively to this group, Edward Everett Hale and Frank R. Stockton. Both have accomplished their purpose without the use of local color; both command inexhaustible funds of wit and humor; both are masters of the rare art of verisimilitude. Stockton's situations and characters are often grotesquely absurd; yet with such gravity does he treat them that one often finds himself actually accepting without a murmur things that could have happened only in a world of fantasy.

4. *Idealism.* To draw an absolute line to separate all novelists into two groups, realists and idealists, would be an impossible task. With the extremes there is no question, but midway between there is a large class who are allied more or less with both schools. Of purely romantic novelists the period has produced comparatively few. Many who, in opposition to the realists, have insisted that a novel must have a hero and heroine, a well-defined plot, and a rapid play of incident, have also been careful to draw their backgrounds and characters faithfully from nature. It is a significant fact that almost without exception the novels of the period that have proved most widely acceptable have belonged to this group. From the mere standpoint of enormously multiplied editions, E. P. Roe and Lewis Wallace stand, after Mrs. Stowe, as the most successful of American novelists. Roe produced his novels with a purpose. He was a clergyman, and to reach a wide audience he put his moral teachings into the form of fiction, skillfully mingling enough of sentiment, sensation and story to win the masses. Many were led to read Roe's novels by the fact that their author was a clergyman, and that the morals of his work were plain; the same readers were attracted to Wallace because his *Ben Hur* was a historical novel and a "tale of the Christ." With a prodigal wealth of imagination and a fine mastery, at times, of vivid narration, Wallace lacks sustained power. Were his novels symmetrical, and as good as a whole as they are in parts, his rank would be indeed high. Another author with a large contemporary popularity was J. G. Holland, who wrote many romances from a wide knowledge of American life, but all are fatally defective at some point, as is proved by the rapidity with which they have been forgotten. Miss Louisa M. Alcott, on the contrary, has constantly grown in popularity. The freshness and simplicity of her tales for boys and girls have already made them classics in their field.

Of the younger group of novelists few have as yet settled into the places which they will ultimately occupy. Julian Hawthorne, at one time the most promising figure in later fiction, has produced no strong work since his early success. His *Archibald Malmaison* is one of the strongest purely romantic novels since the time of the elder Hawthorne, but his later attempts, like *A Fool of Nature*, may be ranked among the weakest. Arthur Sherburne Hardy, with his *But Yet a Woman* and *Passé Rose*, both drawn with exquisite art, Hjalmar Hjorth Boyesen, with his charming prose idyls of Norwe-

gian life, Margaret Deland, with her strong studies of religious and social problems, and many others, deserve more than a passing mention. Perhaps the most promising of the younger group is F. Marion Crawford, whose strong dramatic studies, chiefly of Italian life, reveal a mastery of materials and a breadth of view which, if rightly exercised, may in time yield work of the first rank.

ESSAYS AND HISTORY. After prose fiction, the most popular form of literary expression during the period has been the essay. This variety of composition has meant many different things since the days of Francis Bacon, but of late it has been generally accepted as covering all short prose studies not claimed as fiction. Mitchell's pensive sketches, Whipple's reviews, Curtis's chats on contemporary life, Warner's sparkling "roundabout talks," and Burroughs's nature-studies may all be discussed as essays. Three of the most delightful of modern essayists belong in reality with the older group. Donald G. Mitchell, Thomas Wentworth Higginson and George William Curtis published their earliest work near the middle of the nineteenth century, yet so completely have they identified themselves with the present that they are best studied with the members of the later group. The one who belongs the least to the present is Mitchell, who may be characterized as the last member of the school of Irving. The nervous haste of modern life has never ruffled his prose. It flows on and on with a refinement of movement like a meadow brook in June, its gentle murmur full of tenderness and humor and pathos. Higginson has won laurels as a poet, novelist and essayist, but his best work is unquestionably his *Outdoor Papers* and his essays on literary themes. Curtis stands as the best example that we have yet produced of the cultured literary journalist. His training was most exceptional. Eighteen months at Brook Farm and eighteen months at Concord under the direct influence of Emerson were followed by four years of travel in Europe, Egypt and Syria. His first works were descriptive of his life on the Nile and in Syria—gorgeous sketches, full of the sensuous dreams of the Orient. His later work sprung largely from his journalistic experience. His essays, contributed monthly to *Harper's Magazine* for nearly forty years, his *Literary and Social Essays*, and his charming series, *Prue and I*,—all reveal a rare personality and a refinement of prose style which make them worthy of comparison with the best works of such masters even, as Addison and Charles Lamb.

Of the later essayists, the typical figures are Charles Dudley Warner and John Burroughs, both of whom did their first work during the remarkable decade which opened in 1870. Warner is the most humorous of essayists. His volumes, like *My Summer in a Garden* and *Backlog Studies*, fairly sparkle with their wealth of droll conceits, their wise turns, and brilliant epigrams. But he is more than a mere jester: he is a close observer of nature and a student of life. His works are intensely original, full of a deep honesty and a manly independence. He is pre-eminently an essayist; even his volumes of travel, like *My Winter on the Nile*, are in reality but collections of essays. His humor is abundant and never too broad, his style is finished and graceful, and over all is the charm of a rare personality as delightful in its way as that of Irving.

One more characteristic of the present period remains to be mentioned,—the formation of what may be called the out-door school of writers. External nature, especially the ways of birds, has been studied with extreme care. Nothing connected with the woods and fields has been deemed too unimportant for patient investigation. In reality this is but a phase of the realism that has dominated the period,—a branch of what has already been termed "literature of the soil." It was but natural that some one should do for the birds and the forest denizens what the novelists were doing with human types. The movement originated unquestionably with Thoreau. No one has ever equaled him as a minute observer of nature's ways, or as an enthusiastic interpreter of her secrets. It remained for John Burroughs, the leader of the later school, to mingle the poetic with the scientific, to humanize and idealize nature. He studies birds as if they were "little people in feathers"; his woodchucks and bees and foxes are all strangely human. He delights in the borderlands between the forest and farm; he talks delightfully of footpaths, of wild apples, of locusts and wild honey. Everywhere he beckons to fresh fields,—fields which we may have passed through constantly, yet which this prophet of the fields at once transforms into pastures new. There have been many disciples of Thoreau and Burroughs. Maurice Thompson, Bradford Torrey, Olive Thorne Miller and Frank Bolles are but a few of the school of writers who have studied nature, especially the ways of wild birds, with loving care.

In the fields of history the period has been especially brilliant. Confining themselves wholly to American themes, our historians have covered minutely almost every section of the continent and every significant event since its discovery. The modern methods of writing history introduced by Macaulay, Prescott, Bancroft and Motley have been carried to a high degree of perfection. No labor is spared in securing perfect accuracy. Public documents, state papers, contemporary maps, newspapers and letters must be examined with thoroughness; the condition of the common people, the "noiseless revolutions" of the school, the church, the mill and the store are studied as carefully as the doings of courts; the elements of cause and effect are constantly looked to and lessons are drawn for the future. In addition to this thoroughness of study, our historians have cultivated a graphic narrative style, so that history is no longer a dry collection of facts.

The typical historian of the modern group is Francis Parkman, who took as his field for study the *History of France and England in North America*. Although partially blind and able to work only a few hours daily, he has covered this broad subject so completely that he will never be displaced as its historian. His preparation was most thorough. For one summer he lived in the wigwams of a tribe of Sioux Indians, that he might know in all its details the life of this people who

were to figure so conspicuously in his work. He visited every scene described in his history, and made no statement which he could not corroborate by unqestioned documents. But he was not merely a master of materials, he was master also of a most brilliant prose style, one that can be compared only with that of Prescott. The stirring scenes seem to re-enact themselves, and the reader is drawn on and on by the narrative as if it were a romance. Of later historians of the United States the leaders are John Bach McMaster, who is publishing a comprehensive study of the period from the close of the Revolution to the Civil War; John Fiske, who is making most valuable studies of the Colonial and Revolutionary eras; Justin Winsor, who has made exhaustive researches into the beginnings of American history, and Hubert Howe Bancroft, who has filled forty volumes with a minute history of the Western coast.

THE OUTLOOK. The period beginning with the Civil War is as yet unfinished, and while we can now, more or less darkly, perceive its general characteristics, it is as yet impossible to predict its limits. As the first great creative period was a direct result of the confidence inspired by the outcome of the second war with England, a war that gave us for the first time a secure place among nations, so the present era has been largely the result of the outcome of the civil struggle, a war that settled many problems that had long impeded national progress. It was followed by a period of rapid expansion in every domain of activity, including that of letters. Literature had been largely confined to the north-eastern coast section of America, but it now crept into the South and the West, until literary centers now cover the continent. Many unprecedented elements have appeared. The marvelous growth of the newspaper and the literary magazine, the enormous increase of the reading public, the rapidity of communication between all parts of the republic, and indeed of the world, the great rise in the pecuniary values of literary products, the modern American trait of rapid action and high tension,—a thousand elements, many that have never before influenced literary production,—have given the period its character. While it has been unquestionably an "interregnum," a distinctively minor period, inasmuch as it has not produced a single writer of high rank, it has nevertheless been an important one. It may be called the era of literary expansion, a time of establishing new landmarks and of laying new and broad foundations. When conditions have become more settled, when the confusion of mere material expansion shall have died away, a new era of literary creation, one surpassing even the first in power, must surely result. F. L. PATTEE.

AMERICAN PARTY, THE, OR NATIVE AMERICAN AND KNOW-NOTHING, as it was sometimes called, sprang from that dread of the naturalized citizen, which has never been wholly absent from our political life, and which is sure to break out at times remarkable for the large numbers of newcomers to our shores. The Irish risings, the French Revolution, the massacre at San Domingo, and the establishment of the Negro Republic, drove to this country, during the last decade of the eighteenth century, thousands upon thousands of Frenchmen and Irishmen, who, availing themselves of our liberal naturalization laws, became citizens and entered political life in the land of their adoption. Then, for the first time, fear was expressed that the founders of the republic had been too liberal; that it was not safe to invest the new citizen so early in his career with all the rights of the native; and in 1798 the term of residence prior to naturalization was changed to 14 years.

The Republicans, who secured control of affairs in 1801, repealed this law, and reduced the term to five years, and a whole generation passed away without any further signs of hostility to the foreigner.

Fortunately, the period during which this feeling was strongest was that during which immigration was smallest. But, with the end of the Napoleonic wars, the tide again set strongly toward America; foreigners came to us at the rate of 20,000 a year; and with their appearance the old spirit of Native Americanism revived.

From 30,000, in 1830, the number of immigrants grew steadily till it passed 60,000, in 1836. In the decade between 1830 and 1840 more than 500,000 landed at New York alone, and when it was known that 1 white person in every 20 of the population was foreign-born, these arrivals began to assume an alarming significance. In Cincinnati, in 1840, half of the voters were of foreign birth; 28 per cent were Germans; 16 per cent were English, and 1 per cent French. In Dubuque County, Iowa, the aliens cast one third of all the votes given at local elections. In St. Louis and in New Orleans the influence of foreigners was felt still more, and from the men of the West came the cry that they were being swamped by the dregs of Europe. A demand was then made for a reform in the naturalization laws, and the extension of the term of residence to 21 years. But both Whigs and Democrats, in their platforms, indorsed the cause of the emigrant, and the question became. Shall a new party be formed, or the old parties reformed? The question was answered by the people of Louisiana, who called a state convention in 1841 and founded the American-Republican party, or as it now came to be called, "The Native American." The principles of the new party were,—

1. Extend the term of naturalization to 21 years.
2. Nominate no man to office who is not native-born.
3. Prevent the union of church and state.
4. Keep the Bible in the schools.
5. Resist the encroachment of a foreign, civil and spiritual power on the institutions of our country.

In a community thus excited, some local incident was all that was needed to bring about the instant union of the natives, and this incident was furnished by the political leaders in New York. For years past the elections in that city had been closely contested by the Whigs and Democrats; and when, with the aid of the Irish vote, the Democrats won in 1843, and gave a large proportion of the patronage to citizens of foreign birth, both Whigs and Democrats bolted their parties, joined the feeble American-Republicans, and in April, 1844, chose a native

mayor and board of aldermen. Meantime the excitement in New York spread to New Jersey and to Philadelphia, where the efforts to organize a party produced the dreadful riots of May and July, during which many lives were lost and many churches and buildings burned. In both cities the success of the Americans was due to a determination on the part of earnest and patriotic Democrats to punish their party. The punishment inflicted, they went back to their allegiance, elected a Democratic mayor of New York in 1845, and, after enabling the Americans to send six representatives to the Twenty-ninth Congress, so weakened the party by their desertion before 1846 that but one American-Republican sat in the Thirtieth Congress, and he came from Pennsylvania. In 1847 such districts as still maintained an organization went through the form of sending delegates to a national convention which met at Pittsburg in February, and, after nominating a Vice-President, recommended Zachary Taylor for President. The campaign which followed served but to exhibit their weakness, and in the Thirty-first Congress (1849–51) not one American-Republican found a seat.

The political disturbances in Europe from 1848 to 1850, and the discovery of gold in California, once more turned the stream of emigration westward. Almost as many now came in three years as had ever at any previous time arrived in ten years. From 1840 to 1850 the sum total of arrivals was 1,500,000. But, in 1851, 600,000; in 1852, 380,000; and in 1853, 370,000 foreigners entered the United States. The old feeling of dread revived, and some time and somewhere in New York City, in 1852, was founded "The Supreme Order of the Star-Spangled Banner," a secret oath-bound association which spread over the country like wildfire. It was a network of local secret associations or councils, whose members were bound together by secret oaths, and recognized one another by signs, grips and passwords. The councils of each state were arranged in four degrees, and over these degrees presided a grand council of the United States of North America, with its president, its vice-president, secretaries, inside sentinel, outside sentinel and chaplain. Every member of a council was required to be 21 years old, to believe in the existence of a God, and to obey without question the will of the order. Highly organized, thoroughly in earnest, it did its work with a precision of movement and a concert of action hitherto unknown in American politics. Its nominations were made by secret conventions of delegates from the various lodges in the city or the district the candidate was to represent; they were generally of the best men, irrespective of party, and were voted for by the members of the order under penalty of expulsion. No public indorsement was ever made, but the result, when viewed the day after election, left no doubt that a powerful secret body of voters was at work defeating the schemes and setting at naught the calculations of the politicians.

At first all was harmony, and in 1854 the new Native American party carried the elections in Massachusetts and Delaware, and in New York state secured some Congressmen and polled 122,282 votes. By this time the party had thrown off much of its secrecy. The name of the order had been discovered. Its secret alphabet was known. It did did not hesitate to indorse men and to put forth candidates of its own. The meeting-places of its councils were no longer concealed, and it had received from its opponents the popular name of Know-Nothings. It is said that the true name and purpose of the order were known to none save those who reached the highest degree, and that as members of the lower degrees, when questioned about their party, always answered, "I don't know," the nickname "Know-Nothings" was given it, and at once accepted. But its avowed purposes were well known; and as described in sober and responsible publications, the Know-Nothing was a man who opposed, not Romanism, but *political* Romanism; who insisted that all church property of every sect should be taxed; and that no foreigner under any name—bishop, pastor, rector, priest—appointed by any foreign ecclesiastical authority, should have control of any property, church or school in the United States; who demanded that no foreigner should hold office; that there should be a common school system on strictly American principles; that no citizen of foreign birth should ever enjoy all the rights of those who were native-born; and that even children of foreigners born on the soil should not have full rights unless trained and educated in the common schools.

These were principles which appealed so strongly to the South that the new party in the elections of 1855 secured the land commissioner of Texas, the legislature and comptroller of Maryland, and all but carried the states of Virginia, Georgia, Alabama, Mississippi, Louisiana and Texas. In the North the triumph was complete, and the governors and legislatures of New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, California, and Kentucky were Know-Nothings.

The success at the elections in 1855 encouraged the grand council to prepare the order to enter the Presidential campaign of 1856 as a national party. A secret meeting was accordingly held at Philadelphia in February, and there the first and only national platform of the Know-Nothings was adopted. As presented by the grand council and adopted by the convention, the platform declared the following principles:

3. Americans must rule America; and to this end native-born citizens should be selected for all state, Federal, and municipal offices of government employment in preference to all others.

5. No person should be selected for political station who recognizes any allegiance or obligation of any description to any foreign prince, potentate or power.

6. The unqualified recognition and maintenance of the reserved rights of the several states, . . . and to this end the non-interference by Congress with questions appertaining solely to the individual states.

7. The recognition of the right of native-born and naturalized citizens of the United States, permanently residing in any territory thereof, to frame their constitution and laws.

9. A change in the laws of naturalization, making a continued residence of 21 years an indispensable requisite for citizenship.

10. Opposition to any union between church and state; no interference with religious faith or worship; and no test-oath for office.

12. The maintenance and enforcement of laws constitutionally enacted until said laws shall be repealed or declared null and void by judicial authority.

The third, seventh and ninth planks were put in to please the old-time Native Americans; the fifth and tenth were for the anti-Catholics; the sixth and twelfth, which related to the enforcement of the fugitive-slave law, were to satisfy the South; the seventh, and a hearty condemnation of the President and the Kansas Bill, it was expected would win votes in the North. In reality it pleased no one, and after a short struggle fifty "North American" delegates, from seven free states, quit the convention, which then nominated Millard Fillmore and Andrew Jackson Donelson. The Whigs, a few months later, indorsed the nominees. But it was too late; a wave of Republicanism was sweeping eastward from the Northwest, and in November, 1856, swept Know-Nothingism out of the North. In a popular vote of 4,053,967, the American party cast but 874,534; of 296 electors it secured but 8, and sent but 20 Representatives and five Senators to Congress. In 1858 it suffered still more, and to the Congress which met in December, 1859, not one Native American came from any state north of the Potomac and the Ohio save Maryland. In 1860 the Know-Nothings became extinct. J. B. McMASTER.

AMERICAN RIVER, in north-central California, is a branch of the Sacramento, formed by the junction of three small confluents, which rise in the Sierra Nevada and wind among those mountains in narrow, deep cañons. The land surrounding these branches affords a valuable supply of gold.

AMERICAN SOCIAL SCIENCE ASSOCIATION. See SOCIAL SCIENCE, in these Supplements.

AMERICAN SUNDAY SCHOOL UNION. See SUNDAY SCHOOLS, in these Supplements.

AMERICAN UNIVERSITY, a post-graduate institution in Washington, District of Columbia, chartered May 28, 1891, and placed a year later under the patronage of the Methodist Episcopal Church. The citizens of Washington donated a site of 90 acres on Massachusetts Avenue for the buildings. The President, the Vice-President, the chief justice of the supreme court, and the speaker of the House of Representatives of the United States are *ex officio* members of the board of trustees, which number 50. Its faculty has been organized with the special object in view of providing advanced courses of study for graduates of other colleges. Its chancellor is Bishop J. F. Hurst, D.D., LL.D.

AMERICUS, capital of Sumter County, southwestern Georgia. It is situated on the Georgia and Alabama and the Central of Georgia railroads, 71 miles S.W. of Macon. It has a female college. The country around produces live-stock, as well as cotton. Population 1890, 6,398.

AMERICUS, a town in Lyon County, east-central Kansas. It is situated on the Missouri, Kansas and Texas railroad, 10 miles N.E. from Emporia. Population, 393.

AMERIOLA, an ancient Sabine city, in central Italy. It was destroyed at a very early period by the Romans, and its site cannot be determined. It is supposed to have been a city of the ancient Latins, who formed a confederation of 30 states.

AMES, a town in Story County, central Iowa, on the Chicago and Northwestern railroad, 29 miles W. of Marshalltown, and about 40 miles N. of Des Moines. Iowa State Agricultural College is situated three miles S.E. of the town, connected therewith by the Ames and College railroad. Population, 1890, 1,276; 1895, 1,910.

AMES, ADELBERT, an American soldier and statesman, was born in Rockland, Maine, Oct. 31, 1835. He graduated at West Point in 1861 and became an officer of artillery. He served with distinction throughout the Civil War, and was wounded at Bull Run. In 1866 he became lieutenant-colonel of the Twenty-fourth infantry; and in 1868 was appointed provisional governor of Mississippi. He became United States Senator in 1869; was elected governor of Mississippi in 1873, and resigned his seat in the Senate. The disorganized state of affairs, however, finally led to his retirement, and he removed to Minnesota in 1876.

AMES, CHARLES GORDON, an American preacher, journalist and lecturer. He was born in Dorchester, Massachusetts, Oct. 3, 1828. He became noted as an organizer of charitable reforms, and in 1889 accepted the pastorate of the Church of the Disciples, Boston, in succession to J. Freeman Clarke. Edited *Minneapolis Republican* and the *Christian Register*.

AMES, EDWARD RAYMOND, Methodist Episcopal bishop, born in Athens, Ohio, May 20, 1806. In 1828 he opened a school at Lebanon, Illinois, which afterwards became McKendree College. In 1830 he joined the Methodist Episcopal Church, and 10 years later was chosen corresponding secretary of the Missionary Society. He became a presiding elder in 1844, and filled the position till he was chosen bishop in 1852. Ames was the first Methodist bishop to visit the Pacific Coast. He died in Baltimore, April 25, 1879.



EDWARD RAYMOND AMES.

AMES, JOSEPH, an American painter; born in Roxbury, New Hampshire, in 1816. He was wholly self-taught when some of his best works were produced, during his earlier period. He later studied at Rome. He returned to the United States, finally settling in New York City. In 1870 he was elected a member of the National Academy of Design. Among his noted works were portraits of Emerson, President Felton of Harvard, and the "Death of Webster." He died of brain fever in New York, Oct. 30, 1872.

AMES, MARY CLEMMER. See HUDSON, MARY, in these Supplements.

AMES, NATHAN P., an American manufacturer, was born in 1803. He began business as a cutler in 1829, and founded the Ames Manufacturing Company at Cabotville, Massachusetts, in 1834. He became famous as a manufacturer of swords, cannon, church bells, and bronze statuary, and supplied both the United States and Great Britain with arms and machinery. The bronze statues of Washington in New York and of Franklin in Boston were constructed by him. He died at Cabotville, Massachusetts, April 23, 1847.

AMES, NATHANIEL, an American mathematician, born in Bridgewater, Massachusetts, 1708. He acquired a household reputation throughout New England by his calculations as an astronomer, in his almanacs, which were published successively from 1726 to 1775 (after 1765 by his son, N. Ames, Jr.). He kept a tavern in Dedham, which in those days added to his celebrity. His son, Fisher, was a distinguished orator and patriot. See Vol. 1, p. 735. Ames died at Dedham, Massachusetts, July 11, 1764.

AMES, OAKES, American manufacturer, born in Easton, Massachusetts, Jan. 10, 1804. At an early age he became a member of the firm of Oliver Ames and Sons, manufacturers of shovels and picks, and during the gold excitement in California, and later in Australia, turned out enormous quantities of these supplies. During the Civil War the firm furnished the government with a large proportion of the swords and shovels used. In 1861 Mr. Ames became a member of the executive council of Massachusetts. From 1862 to 1873 he served in Congress, where he led in the development of the Pacific Railroad legislation. He died in North Easton, Massachusetts, May 8, 1873.

AMES, OLIVER, American manufacturer, born in Plymouth, Massachusetts, Nov. 5, 1807. He was a member of the firm of Oliver Ames and Sons, manufacturers of shovels, picks, swords, etc., and at his brother's death became president of the firm. He was a member of the Massachusetts senate from 1852 to 1857, and was elected president of the Union Pacific Railroad Company in 1868. He died in North Easton, Massachusetts, March 9, 1877.

AMES, SAMUEL, American jurist, born in Providence, Rhode Island, Sept. 6, 1806. After graduating at Brown University in 1823, he became a member of the Rhode Island bar. He was a member of the city council of Providence, and for many years served in the state assembly, being speaker of that body in 1844 and 1845. During the period of the rebellion in 1842 he was a quartermaster of the state troops, and in 1853 was appointed by the legislature to represent the state in the adjustment of the boundary between Rhode Island and Massachusetts. He was one of the commissioners in 1855 to revise the statutes of Rhode Island, and in 1856 was elected chief justice of the supreme court of the state. Mr. Ames was the joint author of *Angell and Ames on Corporations*, and the reporter of volumes 4 to 8 of *Rhode Island State Reports*. He died in Providence, Dec. 20, 1865.

AMESBURY, a city in Essex County, northeastern Massachusetts. It is at the terminus of the Salisbury and Amesbury branch of the Boston and Maine railroad, and is 42 miles N. of Boston. It contains an excellent high school, and is the headquarters of extensive manufactures of boots and shoes, carriages and woolen goods. It is famous as the home of the poet Whittier, who, in 1840, removed there. Population 1890, 9,984.

AMHARA, the middle and largest of the three divisions of Abyssinia, extends from the Tacazze River to the Blue Nile. In its center is the picturesque Lake Tana, and to the north Mount Jared (14,114 feet), and Ras Das Nan (15,160 feet). Its capital is Gondar, the population of which is about 5,000, and the center of the internal trade of Abyssinia.

AMHARIC LANGUAGES. See SEMITIC LANGUAGES, Vol. XXI, p. 655.

AMHERST, capital of Cumberland County, northern Nova Scotia. It is a port on an arm of Cumberland Bay, and is on the Intercolonial railroad, 9 miles S.E. of Sackville, and 30 miles N.W. of Oxford Junction. It is in a coal region. Ship-building is its chief industry. Population, 3,781.

AMHERST, capital of Amherst County, southwestern Virginia. It is situated on the Southern railroad, 153 miles S.W. by W. of Alexandria. Population 1890, 590.

AMHERST, J. H., actor, born in London, England, in 1776. After appearing in his native city he emigrated to Philadelphia, and became director of "Cook's Equestrian Company," taking a part in *Mazeppa*. He was an accomplished classical scholar, and wrote many plays, among his most popular being *Will Watch, or, The Black Phantom* (1825); *Napoleon Bonaparte's Invasion of Russia, or, The Conflagration of Moscow* (1850); *Ireland As It Is* (1850); *The Battle of Waterloo* (1850), and *Ireland As It Was* (1850). He died in Philadelphia, Aug. 12, 1851.

AMHERST, JEFFERY, BARON AMHERST, an English soldier, born in Riverhead, Kent, England, Jan. 29, 1717. When a boy he served in Flanders, where he won distinction and became a favorite of the king. Going to America in 1758, he accomplished the conquest of Canada from the French. In 1760 he was appointed governor-general of the British possessions in America, and in 1763 was made governor of Virginia. In 1776 he was raised to the peerage, and in 1787 received a patent as Baron Amherst, of Montreal. He died Aug. 3, 1797.

AMHERSTBURG, a town in Essex County, Ontario, Canada, situated on the Detroit River, near its entrance into Lake Erie. It is the terminus of the Essex and Amherstburg branch of the Michigan Central railroad, the distance between these two points being 16 miles. Amherstburg—which was named after Baron Amherst (q.v., in these Supplements)—was, during the war of 1812–14, first dismantled by the British under General Proctor, and afterward destroyed by the Americans under General Harrison. Its manufactures consist chiefly of mill products and iron. The principal buildings are the courthouse and a lunatic asylum. The city

owns its own water-works and electric-lighting plant. Population, 2,279.

AMHERST COLLEGE has its seat in the town of Amherst, Hampshire County, Massachusetts. It



AMHERST COLLEGE CHAPEL AND DORMITORIES.

was founded as the Collegiate Institution of Amherst in 1821, and incorporated under the name of Amherst College in 1825. It is a famous institution; unsectarian, but founded under Congregational auspices, one of its organizers being Noah Webster. It has, from time to time, benefited by many handsome donations of money to its funds, and by contributions to its art and museum departments. Its property and endowments are valued at $2,000,000, and its annual income is $70,000. It is celebrated for the number of its graduates who have subsequently entered the ministry. But all its scientific departments are richly endowed, and its museum collections are, in some sections, particularly the archæological and art collections, unrivaled. Physical culture is one of the chief objects encouraged among the students; every one, unless specially excused, having to devote half an hour daily in the Pratt Gymnasium to light exercise, a qualified physician superintending the instruction. Outdoor sports and athletics are also encouraged, Pratt Field having been donated for the purpose. The "Amherst system," by which the students govern themselves by a senate, original here, has been adopted in other collegiate institutions. The number of instructors in 1895 was 33, and the number of students 460.

AMHERST ISLANDS are a group lying west of the southwestern extremity of the peninsula of Corea, in the Yellow Sea.

AMI, HENRY M., Canadian scientist, born in Belle-Rivière, Quebec, Nov. 23, 1858. After he was graduated at McGill College in 1882, he was appointed on the staff of the geological survey of Canada, became assistant paleontologist in 1886, and the same year was engaged in classifying the fossil remains of Canada. He has published numerous reports on stratigraphic and paleontologic subjects. In 1883 he became a permanent civil service officer.

AMIA, a genus of ganoid fishes of an archaic type. *A. calva*, the only existing species, is found in the fresh waters of North America. It is variously known as dogfish, lawyer, bowfin, mudfish, brindle and grindle.

AMICE OR AMICTUS. See COSTUME, Vol. VI, p. 462.

AMICIS, EDMONDO DE, an Italian soldier and author, born at Oneglia, Oct. 21, 1848. Receiving a military education, he entered the Italian army in 1865, and in the following year was present at the battle of Custozza, against the Austrians. After the capture of Rome by Victor Emmanuel in 1870, he retired from service, and devoted himself to literature. He visited Spain, London, Morocco, Constantinople and other places, and published volumes which contained graphic descriptions and impressions of his travels, and which were highly praised. One of his earlier works was *La Vita Militare* (1869), and his last was *Il Romanzo d'un Maestro* (1889), which deals in a telling manner with the state of education among the Italian people.

AMIDE POWDER. See GUN-POWDER, in these Supplements.

AMIDES. See CHEMISTRY, Vol. V, pp. 554, 577, 578.

AMIDOGEN. Formerly this was regarded as a hypothetical radical, with a supposed formula, $NH^2$, known to exist in different organic compounds. Curtius, however, produced the sulphate of amidogen, from which he isolated the amidogen by the action of an alkali. Its formula has been shown to be $NH^2—NH^2$, and not $NH^3$. It is a gas with a peculiar odor, somewhat like ammonia. The vapor, absorbing moisture and forming minute drops of the liquid hydrate, produces a white cloud in the air. Brought in contact with water, it dissolves with evolution of great heat. It attacks the skin in the most painful manner, and rapidly destroys cork and caoutchouc.

AMIEL, HENRI FRÉDÉRIC, was born at Geneva, Sept. 21, 1821. He studied and traveled much abroad. At Berlin he was thoroughly imbued with German science and philosophy. In 1849 he was appointed professor of esthetics and French literature at the Academy of Geneva, which post he exchanged four years later for the professorship of moral philosophy. Amiel died at Geneva, May 11, 1881. During his life he published very little. But he was at work daily upon the work published posthumously, entitled *Journal Intime*, the first portions of which appeared in 1882 and the second in 1884. This proved a remarkable work and secured fame to the dead scholar. In 1889 an English translation appeared, by Mrs. Humphry Ward. The work has left a deep impression, dealing as it did with the spiritual and intellectual doubts that assail the greatest minds.

AMIRANTE ISLANDS, a group of 11 low, wooded islands, situated southwest of the Seychelles, opposite the eastern coast of Africa. They belong to Great Britian, and form a dependency of Mauritius.

AMISH OR AMMANITE COMMUNITY, a religious sect of Pennsylvania, of Dutch descent, originally settled in the southeastern portions of the state, principally Lancaster County. They proceeded north in 1848, and located in Buffalo valley. This was a famous horseshoe-shaped region, formed by the towering mountains around, the open side lying along the Susquehanna River, in Union County. The Amish religion was a form of the German Baptist, but in the ceremony of baptism it was a peculiar feature of their function that there should be three immersions instead of one. Great crowds assembled to witness these immersions and congregated along

the banks of the Buffalo Creek, chosen for the purpose. The Amish were unable, however, to secure possession of the entire valley, as they had intended. They were thrifty and soon became wealthy. They devoted themselves to the cultivation of the soil entirely, and there were no better farmers in the state. They held their property individually, and helped their less fortunate brethren to secure farms, by lending them money without interest. The community built a meeting-house, a short distance from the creek, and standing alone in the valley, a few miles from Mifflinburg. It is a plain building, without a steeple, consisting of a commodious hall and a basement. Therein they hold their annual love-feast, which lasts three or four days. The women use the basement for cooking and providing meals for the members in attendance. An important ceremony during the feast is the washing of feet. The men sit on one side of the hall and the women on the other,—the men washing the feet of their brothers and the women the feet of their sisters. The men's clothes are devoid of buttons, the place of these being taken by hooks and eyes. Their coats are shaped in a style their neighbors have called "shad-bellied." The women dress according to Quaker simplicity, wearing sun-bonnets. The men never shave. The Amish set their faces against war and law processes. They exhaust all means to arrange any dispute with their neighbors, and if these fail, they bear the loss that might otherwise have been avoided by legal recourse. With the growth of the community, colonies were formed in other parts of the state and in neighboring states. The first general conference of the sect was held at Lewisburg, where a younger community had sprung up, and as being more central to the communities further removed. To the Lewisburg community belonged Shem Zook, a prominent figure in state affairs of that day. Attention has been recently attracted toward the Amish by the formation of a new colony in the Northwest. The Eastern communities sent their elders to North Dakota to arrange for the purchase and homesteading of a tract of land of from 5,000 to 10,000 acres. There, in the spring of 1896, emigrants from the East proceeded with their families, fully equipped with stock and gear for converting the wilderness into a garden. In the features detailed above there is a resemblance to the Dunkards.

AMITE, a river about 150 miles long and navigable for about 50 miles, rises in the southwestern part of Mississippi, and flows in a southerly direction through Louisiana into Lake Maurepas.

AMITE CITY, capital of Tangipahoa Parish, northwestern Louisiana. It is situate on the Illinois Central railroad and on the Tangipahoa. It is 68 miles N. W. of New Orleans. It has a female seminary. Population, 1,510.

AMITYVILLE, a town in Babylon township, on the south coast of Suffolk County, Long Island, New York. It is on the Long Island railroad, 31 miles E. of New York City, and about half a mile from Long Island Beach. It is a summer resort. Population, 2,293.

AMLETH, an ancient, or perhaps mythical, prince of Jutland, whose story is told by Saxo-Grammaticus, and who is therefore believed by many to be the original hero of Shakespeare's *Hamlet* But it is a fact not taken into account by these believers, that there was no English translation of the work of Saxo-Grammaticus available by Shakespeare. If it could be proved, as has lately been attempted, that Shakespeare actually visited Denmark, the immortal bard might have obtained knowledge of the story there himself.

AMMAN OR AMMON (the ancient Rabbah, rebuilt and called Philadelphia by the Greeks), a ruined city of Syria, on the Zurka, an affluent of the Jordan. It has numerous remains of Grecian edifices. See AMMONITES, Vol. I, p. 742.

AMMELINE is a white crystalline substance, whose chemical formula is $C^3H^5N^5O$, produced by the action of an acid or an alkali on melam, and regarded as an amic acid of cyanuric acid. Called also diamidocyanuric acid.

AMMEN, DANIEL, American naval officer, born in Ohio, May 15, 1820. He entered the navy as midshipman in 1836. From 1861 to 1865 he saw constant and active service, distinguishing himself on many occasions. He was on the *Merrimac* in 1859–60. In 1863 he was promoted to commander, and assigned to the command of the monitor *Patapsco*. He was commissioned captain in 1866, and continued in special and active service until Dec. 11, 1877, in which year he was made rear-admiral, and placed on the retired list after a service of forty-nine years and six months. He is the author of *The Atlantic Coast* (1883), a volume of The Navy in the Civil War Series. He resides at Ammendale, Maryland.

AMMEN, JACOB, American soldier, born in Botetourt County, Virginia, Jan. 7, 1808. He was graduated at the United States Military Academy in 1831, and then served as instructor in mathematics at West Point, Bacon College, Jefferson College, and the University of Indiana. He resigned from the army in 1837. At the outbreak of the Rebellion he became captain of volunteers. He served during the Civil War, through all the successive grades from captain of volunteers to brigadier-general. He was in command of the military district of East Tennessee in 1864, retiring from the army service the following year. He died in Lockland, Ohio, Feb. 6, 1894.

AMMERGAU MYSTERY. See OBERAMMERGAU, Vol. XVII, p. 703.

AMMETER. Ammeters, or ampere-meters, are made in numerous forms, frequently being constructed to serve also as voltameters and watt-meters. The Siemens ammeter makes use of a tube of annealed soft iron, supported at each end in jeweled centers. The surrounding coil does not touch the tube, but serves to magnetize it, so that the arms, which form polar extensions of the tube, are deflected, operating the pointers. Bristol's ampere-meter makes use of knife-edge spring-supports, a recording arm noting the effect of the current by means of the variations in the springs. Morris's ampere-meter acts on the principle of a solenoid on a suspended piece of iron wire.

AMMODYTE, a serpent usually known as ERYX. q.v.; in these Supplements. Also same as SAND-EEL, Vol. XXI, p. 257.

AMMONITES, an extinct genus of mollusks belonging to the *Ammonitidæ*. They closely resemble in structure the existing *Nautillus*, to which they are allied. See MOLLUSCA, Vol. XVI, p. 669.

AMMONITIDÆ, a family of extinct mollusks of the class *Cephalopoda* (cuttle-fishes). They are very numerous, and are the most characteristic mollusks in the rocks of the secondary period. The well-known genera *Goniatites*, *Ceratites* and *Ammonites* are representatives of the group.

AMMONIUM, a celebrated oasis in the Libyan Desert, the site of the famous temple and oracle of the god of Ammon. It is the modern Siwah, and is about 15 miles long and 12 miles wide. It is 300 miles S.W. by W. of Cairo. The oasis possessed a well called Fons Solis, the water of which was cold at noon and warm at night and morning. There was no regular town, the inhabitants dwelling in scattered villages throughout the oasis. The ruins of the ancient temple are still visible. See OASES, Vol. XVII, p. 695.

AMMONIUM THEORY regards the ammoniacal salts as analogous in their constitution to ordinary salts, the only difference being in the substitution of a compound radical ammonium ($NH^4$) for the simple radical of other salts.

AMMONOOSUC, LOWER, a river of New Hampshire. It rises in Coos County, in the neighborhood of Mount Washington. It flows southward and westward through Grafton County, falling into the Connecticut at Woodsville, a village in Haverhill township, opposite the village of Wells River, Vermont. The length of the Lower Ammonoosuc is about 100 miles.

AMMONOOSUC, UPPER, a river of New Hampshire. It rises in Coos County in the vicinity of Mount Randolph, and flows northward, and falls into the Connecticut River at Northumberland, after a course of 75 miles.

AMMUNITION. See GUN-POWDER, in these Supplements; and Vol. I, pp. 744–6.

AMNESIA, loss of memory; specifically, a morbid condition of forgetfulness. See *Amnesic*, under APHASIA, Vol. II, p. 171.

AMNION, a fœtal membrane which invests the embryos of reptiles, birds and mammals. It is formed early in embryonic life from folds of the body wall (somatopleure) which gradually surround and meet so as to completely inclose the embryo in two sacs, one within the other. The inner sac constitutes the true amnion. The space between it and the embryo is filled by a fluid, the *liquor amnii*. The outer sac is often called the false amnion.

AMNION, in botany, is an obsolete term, formerly given to the fluid contents of the embryo-sac. Sometimes wrongly written amnios.

AMNIOTA, a term applied to those animals which possess the fœtal membranes,—amnion and allantois. The group includes reptiles, birds and mammals.

AMŒBA, a genus which includes some of the simplest unicellular animals (*Protozoa*). These animals consist of a mass of protoplasm without any limiting membrane. The name was applied to the animals because of their continual change in form. They are often called proteus-animalcules. The common forms occur in the ooze and mud at the bottom of slow-flowing streams and ponds, or living on aquatic plants. See under *Lobosa*, in PROTOZOA, Vol. XIX, pp. 841–843.

AMŒBEAN VERSES are such as are composed so as to be reciprocally responsive to one another, in the form of dialogue. In the Third Eclogue of Virgil this form of verse is used.

AMOMUM, a monocotyledonous genus of the family *Zingiberaceæ*, to which belong plants yielding cardamoms and the grains of paradise of commerce.

AMORETTI, CARLO, an Italian naturalist, born at Oneglia, March 13, 1741. He made a study of the history and geography of Swiss lakes, the result being his work, *A Journey from Milan to the Three Lakes*. He published a biography of Leonardo da Vinci in 1784, and in 1797 he became librarian of the Ambrosian Library in Milan, dying at the latter place, March 24, 1816.

AMORGOS, an island among the Sporades group, in the Grecian Archipelago, 18 miles S.E. of Naxos. It is 13 miles long and 6 miles wide, and contains many mountains. The chief town is Amorgos, and the port, situated on the northeast coast, is Santa Anna. It belongs to Greece.

AMORY, ROBERT, American physician; born in Boston, May 2, 1842. He graduated at Harvard in 1863, and after studying medicine in Paris and Dublin, he settled in Longwood (Brookline), Massachusetts, in 1867. He occupied several important offices in the town, and in 1869 was elected lecturer at Harvard College, and later professor of physiology in the medical school at Bowdoin College. He resigned in 1874, and became assistant surgeon in the Massachusetts volunteer militia, surgeon two years later, and then medical director. He has devoted much study to chemistry, and has written a great deal on this subject. Among his published works are *Bromides of Potassium and Ammonium* (1872), and *Action of Nitrous Oxide* (1870). He has also contributed numerous important papers to various scientific periodicals.

AMORY, THOMAS, an eccentric author, of Irish descent, who was born about 1691, and died Nov. 25, 1788. He was a son of Councilor Amory, who went to Ireland with William III, and was made secretary of the forfeited estates. Amory lived a retired life. His chief works are: *Lives of Several Ladies of Great Britain; A History of Antiquities, Productions of Nature, Etc.* (1755); and the *Life of John Buncle* (1756).

AMORY, THOMAS COFFIN, American lawyer; born in Boston, Massachusetts, in 1809. He graduated from Harvard College in 1830, and was admitted to the bar four years later. For many years he was connected with municipal affairs in Boston. He published numerous pamphlets connected with the war of the Revolution, and on Ireland. He was also a writer of verses. He died in 1889.

AMORY, THOMAS J. C., an American soldier; born in Massachusetts about 1830. He graduated at

West Point in 1851, and served in several battles of the Civil War. He became major of volunteers in September 1864, and brevet brigadier-general on the 1st of October of the same year, but died seven days later, of yellow fever, in Newbern, North Carolina.

AMOTION, in law, is removal from office, as of an officer of a corporation, and is distinguished from disfranchisement, which is the removal of a member.

AMPELIDÆ, a family name variously applied to oscine passerine birds. The family was classed by Swainson in 1831 as without distinctive characters. It has been restricted of late by American authorities to the *Ampelidæ* proper and placed between *Tyrannidæ* and *Cotingidæ*. They are commonly known as chatterers.

AMPELOPSIS, a genus of the *Vitaceæ*, closely resembling the grape-vine. See VINE, Vol. XXIV, p. 237.

AMPERE, an electrical term adopted by the electrical congress held at Paris in 1881, to designate the practical unit of current-force. It is a current such as would be given with an electro-motive force of one volt through a wire having the resistance of one ohm. The unit received its name from André Marie Ampère, the French physicist. See TELEGRAPH, Vol. XXIII, p. 116.

AMPEREMETER. See AMMETER, in these Supplements.

AMPERETURN, an electrical term, applied to an ampere current through one turn of a coil, considered in regard to electro-magnetic force. An electro-magnet with 1,000 convolutions, and with a 5-ampere current, would have 5,000 ampere-turns.

AMPHIBOLE, in mineralogy, the name of a group of minerals, varying in color and composition, of which hornblende, tremolite and actinolite may be mentioned as examples. They may be described chemically as calcium magnesium metasilicates, with sometimes potassium, sodium or aluminium. Dana classifies them according to the existence or non-existence of the latter substances. They all resemble each other in form, but differ in their manner of crystallization. See MINERALOGY, Vol. XVI, p. 417.

AMPHICTYON, a mythical king of Attica. See AMPHICTYONY, Vol. I, p. 772; also GREECE, Vol. XI, p. 92.

AMPHICTYONIC COUNCIL. See AMPHICTYONY, Vol. I, p. 772.

AMPHIMORPHÆ, a term equivalent to *Odontoglossæ*, and applied by Huxley to a super-family of birds which contains only the flamingos *Phœnicopteridæ*. See FLAMINGO, Vol. IX, p. 286.

AMPHIPODS, an order of small crustaceans, most of which are marine. The genus *Gammarus* lives in fresh water. The beach-flea (*Orchestia*) is a very common form. See CRUSTACEA, Vol. VI, p. 661.

AMPHISSA, a Grecian town near Salona Bay, Gulf of Corinth. It is situated at the base of Mount Parnassus, 87 miles W.N.W of Athens. The Amphictyons, having declared a sacred war against it, it was destroyed by Philip, king of Macedonia, B. C. 338. Amphissa is noted for its acropolis, which contains the remains of an ancient citadel.

AMPHITHERIUM, a genus of extinct insectivorous mammals found in the Lower Oölite, and resembling in many points the living *Myrmecobius*. Their exact affinities are uncertain.

AMPHITRYON, in Greek mythology, a king of Tiryns, son of Alcæus. He was the husband of Alcmene, and putative father of Hercules. The story connected with the origin of the latter has been treated by Plautus in his *Amphitruo*, and in modern times by Molière in his *Amphitryon*.

AMPHIUMA, a North American tailed amphibian, which loses the external gills of its youth. It belongs to the caducibranchiate group of the order *Urodela*. The form is eel-like and about two feet in length; the eyes are covered with skin, and there are numerous teeth. *A. means* is found in the Southern and Southwestern states burrowing in the mud in the ditches of the rice fields. The negroes call it the Congo snake. See AMPHIBIA, Vol. I, pp. 758 et seq.

AMPUDIA, PEDRO DE, Mexican soldier, was appointed general by President Santa Anna in 1840; in December, 1842, he commanded the land forces in the siege of Campeche, Yucatan. Soon afterward Ampudia was dismissed from command for practicing military barbarities. Later he was in command of Monterey, where, Sep. 24, 1846, he surrendered to General Taylor, of the United States forces.

AMPULLARIA, a genus of mollusks of the gasteropod class. Most of the species live partly in fresh water, and partly on land. In adaptation to this mode of life, the vascular mantle functionates as lungs when the animals are on land, and thus takes the place of the ordinary process of respiration by gills.

AMPUTATION, a surgical operation. See SURGERY, Vol. XXII, pp. 678, 679, 688.

AMRITA, literally, "without death," denotes in Hindu mythology the drink of immortality, the product of the mysterious churning of the ocean.

AMROHA, a town in the district of Muradabad, in the northwest provinces of India, 20 miles N.N.W. of the city of Muradabad, in the midst of an extensive cotton and sugar district. Population, 36,145, mainly Moslems.

AMSTERDAM, a city of Montgomery County, east-central New York, is situated on the north bank of the Mohawk, 33 miles N.W. of Albany. Its local trade in general merchandise is extensive. There are large manufactories of knit goods and carpets, and numerous other industries, including the making of paper, brooms and steel springs. Amsterdam is the seat of a Roman Catholic institute, an academy, and excellent public and private schools. Population, 17,336.

AMSTERDAM CANAL. See CANAL, in these Supplements.

AMSTERDAM TREATY, a treaty concluded Aug. 4, 1717, between Russia, Prussia and France on the one hand, and Sweden on the other. Frederick William I of Prussia had involved himself in the war between Sweden and Russia, and attacked Sweden.

By this treaty Russia abandoned the invasion of Mecklenburg, and France agreed not to renew its treaty as to subsidies with Sweden, peace being established between the northern powers.

AMU DARIA, the Oxus River. See OXUS, Vol. XVIII, p. 101.

AMUNATEGUI, MIGUEL LUIS, a Chilean historian, born at Santiago, Jan. 11, 1828, at the university of which place he was educated. He became noted as a scholar, and aided Andres Bello in the latter's *History of Greece and Rome*. In most of his own works he had the collaboration of his brother, Gregorio Victor. The important works to his credit are *Memoria Sobre la Reconquista Española* (1850); *Biografias de Americanos* (1854); *Compendio de la Historia Politica y Eclesiastica de Chile* (1856); *Descubrimiento y Conquista de Chile* (1862); and *Los Precursores de la Independencia de Chile* (1872–73). He died in 1888.

AMURNATH, a cave in the northeastern mountains of Cashmere. It is a natural cave, occurring in the gypsum rock, and thus at an early period supernatural attributes were ascribed to it. It is believed to be the residence of the god Shiva, and is visited by multitudes of pilgrims. Numberless doves inhabit it, and upon being disturbed by the pilgrims, fly out, making a loud noise, which the superstitious visitors regard as a sign of the acceptance of their prayers by the god.

AMUSSAT, JEAN ZULÉMA, a French surgeon, born at St. Maixent, in Deux-Sèvres, Nov. 21, 1796. Entering the army he became assistant surgeon under Esquirol in La Salpêtrière Hospital, and also prosector at the Paris Faculty of Medicine. He was an inventor and improver of many surgical instruments, and was the first to prove the use of torsion of arteries in hemorrhages, upon which subject he published a work in 1829, obtaining for it a prize at the Institute. He was also an authority on lithotomy, and wrote a treatise entitled *Researches Into the Nervous System* (1825). He died in Paris, May 13, 1856.

AMYCLÆ, an ancient town of Laconia, on the eastern bank of the Eurotas, in Greece. It was the home of Castor and Pollux, the "Amyclæan brothers." The place was finally destroyed by the Lacedæmonians under Teleclus. The story ran that the inhabitants had been so long alarmed by false reports of the approach of the Spartans that it was forbidden for any one to speak of the enemy again. When the Lacedæmonians did appear no one dared to mention the fact. Hence it was said that "Amyclæ was lost by silence," which saying passed into a proverbial phrase.

AMYGDALIN is a crystalline principle existing in the kernel of bitter almonds, the leaves of the *Prunus laurocerasus*, and various other plants, which by distillation yields hydrocyanic acid. See ALMONDS, OILS OF, in these Supplements.

AMYGDALOID, "almond-shaped," in geology applied to an igneous, crystalline or vitreous rock containing numerous almond-shaped vacuities, or cells, which were formed by steam or gas while the rock was in a molten state. As cells and cellular structure occur in many different kinds of igneous rock, the term *amygdaloid* no longer denotes a rock species, and has fallen into disuse. It is now only employed in the adjective form, *amygdaloidal*, indicating a cellular or slag-like structure, in which the pores and cells are more or less filled up with nodules of mineral matter, sometimes agate, chalcedony, etc.

AMYGDALUS, an old generic name, which included the peach and almond, but now usually referred as a subgenus to the genus *Prunus*.

AMYL is a hypothetical monatomic alcohol radical, obtained by heating amyliodide with an amalgam of zinc in a closed tube at a temperature of about 350° F., and is one of the natural products of the distillation of coal. Obtained thus, it is represented by two molecules of the radical in union—$(C^5H^{11})$ 2, and is called diamyl. The single molecule $C^5H^{11}$ has not yet been isolated. It enters into a large number of chemical compounds. It exists largely in amylic alcohol or fusel-oil (crude alcohol).

AMYLENE, a limpid liquid produced by the dehydration of amylic alcohol by means of zinc chlorid; is sometimes used as anæsthetic, but is extremely dangerous.

AMYLOID, a term used in chemistry and in botany for starchy substances, like starch, dextrine, sugar, gum, etc., which consist of carbon, hydrogen and oxygen, the latter two being always in the proportion in which they occur in water.

AMYOT, JOSEPH, a French orientalist, was born at Toulon in 1718, and lived as a Jesuit missionary in China from 1750 till his death, which occurred at Pekin in 1794. His knowledge of the Chinese and Tatar languages enabled him to acquire his knowledge of the antiquities, history, language and arts of China from the most authentic sources. His principal writings may be found in the *Mémoires concernant l'Histoire les Sciences et les Arts des Chinois* (16 vols. Paris, 1776–1814). In 1789–90 appeared his *Dictionaire Tatar-Mantchou Français*, in three volumes, and was edited by Langlès.

AMYRIS, a tropical dicotyledonous genus of the family *Burseraceæ*, notable for its abundant yield of fragrant resinous products. It gives name to a crystalline resin known as amyrin.

ANABANTIDÆ, a family of teleostean fishes belonging to the largest order *Acanthopterygii*. The perch, bass, mackerel and swordfish are representative examples.

ANABLEPS, a genus of cyprinodont fishes found principally in tropical American waters. They are interesting on account of the unique structure of their eyes. A dark horizontal stripe divides the cornea, and two pupils are present in each orbit, so that the fish appears to have four eyes.

ANABOLISM, in physiological botany, denotes all those chemical processes going on in a plant which lead to the formation of complex substances from more simple ones. The whole range of chemical processes is included under the term *metabolism*. Anabolism is therefore often called "constructive metabolism," as opposed to catabolism, or "destructive metabolism." Assimilation refers only to those anabolic changes in the plant which concern its

food. Anabolism affects not only the state of the substance of a plant, but also the state of its energy, for it is accompanied by a conversion of kinetic into potential or latent energy. The anabolic process most characteristic of plants, as opposed to animals, is the power possessed by green parts of plants, under the influence of sunlight, of constructing organic substance from carbon-dioxid and water, a process so peculiar as to have received the special name *photosyntax*.

ANABOLISM. See PHYSIOLOGY, Vol. XIX, pp. 13, 19, 22, 49.

ANACANTHINI, a group with uncertain limits, which includes a great number of teleostean fishes. It contains many fishes of great economic importance, such as the cod, hake, halibut, flounder, sole, and many others.

ANACHARIS, a monocotyledonous genus of the family *Hydrocharidaceæ*. It is a native of North America, growing in ponds and slow streams. It has been introduced into Britain, where it is now very abundant and troublesome in some of the rivers,—in fact, much more so than it ever becomes in America. The generic name now used is *Elodea*.

ANACLACHE, a lofty peak of the Bolivian Andes, is more than twenty-two thousand feet above the ocean-level, and is covered with perpetual snow.

ANACLETUS, an anti-pope. See INNOCENT II, Vol. XIII, p. 82.

ANACONDA MINE. See SILVER AND SILVER-MINING, in these Supplements.

ANACORTES, a town in Fidalgo Island, off Skagit County, in northern Washington. It is situated at the terminus of the Seattle and Northern railroad, 95 miles N. of Seattle. It is a fishing-center and ships coal and iron. Population, 1,131.

ANÆMIA. See PATHOLOGY, Vol. XVIII, p. 377.

ANAËROBIA is a name applied to those bacteria which have become so adapted to a life based upon fermentative changes that they can exist without coming in contact with free oxygen, and for some of them the access of free oxygen is destructive. See BACTERIOLOGY, in these Supplements.

ANÆSTHESIA. Local anæsthesia, artificially produced, is of great value in minor operations, and in painful affections of limited areas of the body. Local anæsthesia is often produced by freezing the part with ether spray. Of medicinal agents, the best is cocaine, prepared from the coca shrub of Peru (*Erythroxylon Coca*). In the form of a five to ten per cent watery solution, this drug is introduced into the tissues, by a hypodermic needle, and produces complete anæsthesia of the part thus treated in from three to fifteen minutes. Thymol, menthol, aconite, belladonna, chloroform, phenol, chloral, and Indian hemp have also a local anæsthetic action, if rubbed on the skin or applied to abraded surfaces. Guaiacol has been announced by Dr. Pize of Montélimar, France, as a new anæsthetic. By injecting this substance under the skin in small doses he found that he could perform operations without pain to the patient. A committee appointed by the local academy of medicine examined its application in this manner and reported favorably upon its use. See ANÆSTHESIA, Vol. I, p. 789.

ANAHEIM, a village in Orange County, southern California. It is located on the Southern Pacific railroad, about eight miles N.W. of Santa Anna, in the center of the largest valley in the state, and is the headquarters of the wine interest of that region, producing annually more than one million gallons. Since the establishment of the sugar refinery at Chino, the culture of the sugar-beet has become an important industry in the vicinity of Anaheim. Population, 1,273.

ANAKIM, a race of giants who inhabited the south of Palestine, especially about Hebron, called at that time Kirjatharba. They were also called "Sons of Anak," though by the name *Anak* we should properly understand a race instead of an individual. After the time of Joshua they disappear from history.

ANALCITE OR ANALCIME, a mineral, chemically a hydrated silicate of alumina and soda found in the trap-rocks of Nova Scotia, Lake Superior, Ireland and Scotland. It occurs in the vacuities of the amygdaloids found in the situations named. It receives its name on account of its feeble electric power when subjected to heat or friction.

ANALEMMA, in geometry, denotes a projection of the sphere on the plane of the meridian, made orthographically by a straight line and ellipses, the eye being supposed to be at an infinite distance and in the east or west point of the horizon. Hence it denotes an instrument in use before the invention of trigonometry for drawing such a projection with an horizon or cursor fitted to it. The instrument was formerly used in the solution of astronomical problems.

ANAL GLANDS, a term applied to a number of glands, in various animals, which lie near the anus. Strictly applied, the term is limited to the glands of carnivore and rodents. The secretions usually have a strong and repulsive odor, and are employed for defense. The secretions from the anal glands of the civet and other animals are prepared and used as perfumes.

ANALOGUE, a technical term in biology for an organ in one species or group of animals or plants having the same function as an organ of different structure or origin in another species. It refers to physiological, independent of morphological, resemblance; an organ showing the latter being called a homologue.

ANALYSIS, VOLUMETRIC. See VOLUMETRIC ANALYSIS, in these Supplements.

ANAMORPHOSIS, in perspective, is a distorted picture, which appears in its proper form only when viewed from a particular point, or through a polyhedron, or reflected by a curved mirror. In natural history the term is used for that gradual change of form which can be traced in a group of plants or animals, the members of which have succeeded each other in point of time, from the earlier development to the later. Called also Anamorphism.

ANAMOSA, capital of Jones County, central eastern Iowa, on the Buffalo and Wapsipinicon rivers. It is on the Chicago and North-Western and Chicago, Milwaukee and St. Paul railroads, 50 miles S.W. of Dubuque. It contains a state penitentiary, and is

noted for its quarries of excellent building-stone. Population, 2,006.

ANANIEV, a town on the Black Sea, province of Kherson, on the Tiligool, southern Russia. It is 95 miles by rail N. of Odessa. Population, 16,449.

ANAPA, a naval station and port town for small vessels on the eastern shore of the Black Sea, in Russian Caucasia. It is an important tactical point. Its fort was built upon a projecting crag by the Turks in 1784, and taken by the Russians in 1791. It has a brisk trade with Trebizond. Population, 10,614.

ANAPESTIC METER, in prosody this consists of a foot of three measures, the first two short or unaccented, the third long or accented. It is the opposite of dactylic meter.

ANAPHORA, in rhetoric, is that figure of speech which consists in repeating the same word at the beginning of two or more successive clauses or sentences, as in 1 Cor. i, 20. In liturgics, the more solemn part of the eucharistic service which begins with the Sursum Corda.

ANARCHISM has quite a distinct meaning from anarchy in the usual acceptation of the word. Anarchism is the name adopted by a phase of revolutionary socialism,—an exaggerated idea of individual freedom, which considers government of man by man to be oppression. Anarchism has two aspects: it has a political theory, the negative of government or of external authority; and it has an economic theory as to land and capital, which is common to it with other forms of socialism. The acknowledged father of anarchism, as a form of recent and contemporary socialism, is Proudhon (1809–65), who declared that "the true form of the state is anarchy," by which he meant, not disorder, but the absence of government. Modern anarchism has adopted principles and means, never contemplated by its former advocates. In Germany, though still a political force, those anarchistically inclined now abstain from the more extreme methods that have been used in Russia, France and elsewhere. But such wholesome condition has been achieved only by the exercise of severe repressive measures. German "scientific" socialism became the doctrine taught to recruits to socialism in all countries. It originated with Johann Karl Rodbertus, who, becoming prominent about the middle of the present century, was for a short period minister of education and public worship in Prussia. He was more of a theoretical writer than most socialists, but his ideas had widespread influence. He died in 1875, in his 70th year, and was followed by Karl Marx, of Hebrew extraction, who was a deep student. He produced a book, *Capital*, which has been called the "Socialists' Bible." In 1864 was formed, in London, the International Workingmen's Society, with Marx at its head. But the anarchistic element was constantly antagonizing Marx, who had to expel M. Bakunin in 1872, his bitterest opponent. The latter formed a new international society, its principles being based upon pure anarchism, backed up by the doctrine of "force." The new "red society" grew in strength at the expense of the older. In 1878 commenced the attempts upon the life of the German emperor, and, in consequence, the passage of stringently repressive measures directed against the social democrats. These measures had the result of driving most of the least reconcilable to America, some of them finding their way to Chicago. Anarchism in America made its pubic appearance at the congress of the International Workingmen's Association at Pittsburg, in October, 1883. The anarchist contingent from Chicago had an opportunity of advocating the putting into practice Karl Marx's theory of the use of force; which force was dynamite. This seemed to meet the approval of the congress. August Spies was the English secretary of the association, and he and his associates went home to Chicago to formulate plans for the spread of the new gospel, the terrible climax to which was reached on the night of May 4, 1886, when the Haymarket riot occurred in Chicago. Anarchy in America is an exotic growth, and its few advocates are men and women of foreign names or foreign birth. See *Anarchism, Socialistic*, under SOCIALISM, Vol. XXII, pp. 216, 217.

ANARRHICHAS, a genus of blennioid fishes, typical of the *Anarrhichadidæ* family. *A. lupus*, the common wolf-fish, is the most familiar example. Their mandibular, palatine, and vomerine bones are armed with prominent tubercles capped with enameled teeth.

ANAS, a genus of birds of the subfamily *Anatinæ*. Many of the ducks, geese and swans were formerly classed together in this group, but the name is now restricted to the mallard duck and closely allied species.

ANASARCA. See DROPSY, Vol. VII, p. 472.

ANASSA SATIVA. See PINE-APPLE, Vol. XIX, p. 106; also HORTICULTURE, Vol. XII, p. 274.

ANASTASIUS, the name of four popes. Anastasius I was the most eminent, and held office for only three years (398–402). He enforced celibacy on the higher clergy. Anastasius II (496–498) succeeded Gelasius I. Anastasius III (911–913) succeeded Sergius III. Anastasius IV (1153–1154) succeeded Eugenius III. During his pontificate Arnold of Brescia preached in favor of the abolition of the papal office.

ANASTASIUS, surnamed BIBLIOTHECARIUS ("the Librarian"), was a Roman priest, famous for his Greek scholarship. He became librarian of the Vatican, hence his surname, and translated from the Greek, into Latin, a work entitled *Historia Ecclesiastica*, composed chiefly of extracts from Nicephorus and Syncellus. He died 886 A.D.

ANASTASIUS GRÜN. See GERMANY, Vol. X, p. 546; GRÜN, Vol. XI, p. 224.

ANASTATICA, a genus of plants of the family *Cruciferæ*, or "mustards," natives of the deserts of Arabia, Syria, and North Africa. *A. Hierochuntina* is the rose of Jericho, one of the "resurrection plants," so named because, after flowering, its leafless branches bend together upwards, forming an apparently lifeless ball, which coming in contact with water absorbs it greedily and rapidly expands. In the dry, rolled-up condition, the plants are blown along the sands, like tumble-weeds, scattering their seeds, and upon coming to a damp spot, unroll, rapidly put out

leaves and develop flowers and fruit. The plants are abundant in the Dead Sea region, and have been frequently noted by travelers.

ANASTOMOSIS. See ANATOMY, Vol. I, p. 902.

ANATHOTH was a Levitical city of refuge, situated about four miles from Jerusalem. It is supposed to have been the native place of Jeremiah. There are remains of the ancient city's walls and foundations to be seen to-day. Quarries in the neighborhood still supply Jerusalem with building material.

ANATIDÆ, a family of birds corresponding to the genera *Anas* and *Mergus*, and equivalent to the order *Lamellirostres*, exclusive of the flamingoes. It includes ducks, geese, swans, and mergansers. There are five subfamilies: *Cygninæ*, the swans; *Anserinæ*, the geese; *Anatinæ*, the river or fresh-water ducks; *Fuligulinæ*, the sea-ducks; and *Merginæ*, the mergansers.

ANATINÆ, a large subfamily of *Anatidæ*, which, with a general term, are called "ducks." The shape of the bill constitutes the common character.

ANBURY. See *Club-root*, under AGRICULTURE, Vol. I, p. 368; and BOTANY, Vol. IV, p. 95.

ANCACHS, a department of Peru, lying between the Andes and the Pacific, north of the department of Lima; it is rich in undeveloped silver-mines and in gold. Capital, Huaraz. Population, 284,091.

ANCESTORS, WORSHIP OF, a form of religion which arises naturally from the primitive conception of a soul during life animating the body and exercising influence over it, and after death retaining its power, and continuing into the unseen world the life and social relations of the living world. Having become a deity, it goes on protecting its people and receiving service from them. The worship of ancestors is a subdivision of animism, and its universality has led Herbert Spencer to the opinion that it was the origin of religion everywhere. See MYTHOLOGY, Vol. XVII, p. 141; TOTEMISM, Vol. XXIII, pp. 467, et seq.

ANCESTRY OF PLANTS OR PHYLOGENY. One of the most conspicuous results of the recent study of plant morphology is the development of knowledge concerning the origin of modern groups. That they are the modified descendants of earlier forms is no longer doubtful, and the increasing details of embryogeny, as well as the revelations of paleobotany, have enabled botanists to draw many conclusions concerning ancestral forms. As a general statement, it is true that the higher groups have come from the lower, and such low alga-forms as *Cyanophyceæ* are regarded as representing the primitive forms from which the plant kingdom has developed. While a succession of species has appeared and disappeared throughout geologic time, the great groups, after their first introduction, have always been represented. When reference is made, therefore, to one group as the ancestor of another, it should be remembered that the group as a whole, is referred to, rather than any specific representatives of it in the flora of to-day. In this large sense the *Cyanophyceæ* are regarded as ancestral forms whose origin is too obscure to permit us safely to carry our conclusions as to origin further back. From the *Cyanophyceæ* the *Chlorophyceæ* (ordinary green algæ of fresh waters) seem to have descended, and from these in turn the *Phæophyceæ* and *Rhodophyceæ* (the ordinary brown and red algæ of sea-coasts). This completes the alga assemblage from which the fungi are thought to have been derived by the cultivation of parasitic and saprophytic habits. Among *Thallophytes* (algæ and fungi) the brown and red seaweeds and the fungi are generally regarded as specialized lines, while the green algæ (*Chlorophyceæ*) are looked upon as the ancestral forms of *Bryophytes*, and hence, more remotely, of the groups above. Of the two groups of *Bryophytes*, the liverworts (*Hepaticæ*) are regarded as the more primitive forms,—that is, those which have been derived directly from the *Chlorophyceæ*,—while from liverworts, in turn, the mosses (*Muscineæ*) are thought to have been derived and developed as a specialized line. The *Pteridophytes* (ferns, horsetails, and club-mosses) also seem to have been derived from the liverworts, and although the three existing groups are very much unlike each other in the development of their sporophytes, the similar structure of their gametophytes indicates a closely associated if not common origin among the liverworts. The origin of *Gymnosperms* and *Angiosperms* (together forming the group *Spermaphytes*) is a much-discussed question. The former are much more closely allied to the *Pteridophytes* than are the *Angiosperms*, and by some are regarded as an intermediate group. It is becoming more common, however, to regard them as groups of independent origin; the *Gymnosperms* having arisen from the lycopods (club-mosses), or possibly the cycad division of them having come from the ferns proper; while the *Angiosperms* have arisen independently from the heterosporous *Pteridophytes*, possibly from some such forms as *Isoetes*.

JOHN M. COULTER.

ANCHISAURUS, a dinosaurian reptile of the Triassic period.

ANCHITHERIUM, a fossil genus of three-toed mammals of the equine type, which existed in Europe and America from late Eocene to far into Miocene times. By some authors it is supposed to belong in the ancestral line of the horse. Others think that it stands between the tapir-like *Palæotherium* and one of the ancestors of the horse. See also HORSE, Vol. XII, pp. 173, 174.

ANCHORAGE, a toll levied on the owner or captain of a ship for the privilege of casting anchor on special anchoring-grounds. It is usually payable to the state, but sometimes the right is vested in corporations or individuals. Anchorage also signifies "anchor-ground." See ANCHOR, Vol. II, p. 8.

ANCHOR-ICE OR GROUND-ICE, a kind of ice which forms upon the beds of rivers, or shallow, brackish seas. It forms most readily where the flow of the water is most interrupted and tumultuous. It begins to form when the temperature of the atmosphere falls to within 10° F., and does not adhere strongly to the bottom until zero is reached. When it rises to the surface it frequently brings with it the stones to which it is attached.

ANCHORITE OR ANCHORET. The terms *anchorite* and *hermit* are now used as synonymous, but originally there was a distinction made

between them. Anchorite signified one who, having no fixed dwelling-place, made mountains and deserts his place of retreat, where, alone with God and Nature, he could perform works of penance and subdue the flesh and the Devil. The most famous anchorites of the East were Paul of Thebes, called "first hermit," St. Anthony and St. Hilarion. In the West there were few followers of this sort of life. The term *hermit* was originally applied to one who occupied a cell attached to some religious house. In course of time the title was extended to include all solitary ascetics, in distinction from "monk," which was assigned to ascetics living in communities.

ANCHOVY-PEAR, the fruit of *Grias cauliflora*, a myrtaceous tree growing in boggy places in the mountainous districts of Jamaica and other West Indian islands. The fruit is pickled and eaten like the East Indian mango.

ANCIENT ORDER OF UNITED WORKMEN, a secret friendly or mutual benefit association. It was organized in 1868, in Meadville, Pennsylvania, by John J. Upchurch. There are no restrictions of occupation upon membership, and its aims are purely benevolent or reciprocal. There are three degrees in the association, and it has about 5,000 lodges, under 34 grand or state lodges, with a membership of 355,000 scattered over the Union. Beneficial disbursements to members have averaged over two million dollars annually since its organization, and have grown to over seven million dollars in a single year. Grand lodges represent the subordinate lodges, and in turn send delegates to the supreme lodge, in which supreme officers are annually elected. Headquarters are where the master workman for the time being resides. See BENEFIT SOCIETIES, in these Supplements.

ANCIENTS, COUNCIL OF, an assembly (1795–99) of the legislative body of France, dissolved by the revolution of the 18th Brumaire. It consisted of 250 members, none of whom might be less than 40 years of age. See NAPOLEON, Vol. XVII, p. 202, 203.

ANCILE, a shield of brass supposed to have been thrown down from heaven, on the secure possession of which the augurs taught the safety of Rome depended. By order of King Numa Pompilius, the ancile, with 11 other shields made to resemble it, in order that the genuine one might not be easily distinguishable by a thief, was placed in the temple of Mars, and 12 priests were appointed to keep guard over them. The shields were carried in procession on each 1st of March, through the city, by the guards, who sang warlike songs and beat time on the ancilia with rods.

ANCONA, ALESSANDRO D', a noted Italian critic and philologist of romance literature. Born in Pisa in 1835, he at first took part in the movement for Italian independence. In 1861 he was appointed to the chair of Italian literature in the university of his native city. His publications and pupils were many and famous. His *Dante's Sources of Inspiration* (1847), *The Folk-Song of Italy* (1878) and *Studies of Early Italian Literature* (1884) are his most noted works.

ANCRE, CONCINO DE CONCINI. See CONCINI, in these Supplements.

ANCRUM MOOR, in Roxburghshire, about five miles N. of Jedburgh, Scotland, the scene of the defeat of 5,000 English under Sir Ralph Evars and Sir Brian Latoun, in 1544, by a Scotch force under the Earl of Angus and Scott of Buccleuch. A defaced monument still marks the spot where a Scottish prototype of Moll Pitcher, a maiden named Lilliard, is said to have performed prodigies of valor.

ANDAGOYA, PASCUAL DE, a Spanish soldier and traveler, born in the province of Alava, Spain, about 1495. He went to Darien when very young, and in 1522 became inspector-general of the Indians on the isthmus. The same year he heard of a province farther south, called Peru, and he set out for that place; but before he reached the empire of the Incas, a serious illness forced him to return to Panama. It was through the information received from him that Francisco Pizarro was sent to conquor Peru. Andagoya was banished in 1529 by the governor to Santo Domingo, but returned a few years later as lieutenant to the new governor, and acted as agent to the conquerors of Peru until 1536, when he was sent back to Spain. In 1540 he became governor of the country around the San Juan River, but owing to a dispute with a neighboring governor, went back to Spain. He returned five years later to Manta, Peru, where he died, June 18, 1548. His account of his travels is the standard historical work for its period.

ANDALUSITE. See MINERALOGY, Vol. XVI, p. 408.

ANDANTE, a tempo mark, in music, indicating, in modern usage, a movement somewhat slow, but in a gentle and soothing style. It is often modified as to time and style by the addition of other words.

ANDERAB OR INDERAB, a town in Afghan Turkestan, situate on the river Anderab, on the northern slope of the Hindu-Kush Mountains, 85 miles N.E. of Kabul. It is an entrepôt of commerce between Persia and India. Population, 6,500.

ANDERLECHT, a suburb of Brussels, in the province of Brabant, Belgium, distant 10 miles S.W. from that city. It has considerable brewing and dyeing industries. Population 1895, 32,240.

ANDERMATT OR USERN, a village in the canton of Uri, Switzerland, situated at the junction of the St. Gotthard road with that over the Furka Pass and the Oberalp route. It has long been famous as a tourist center. Population, about 750.

ANDERSEN, CARL CHRISTIAN, Danish poet and archæologist, born in Copenhagen, Oct. 26, 1828. He was sent, at the age of nine years, to a relative of his mother in Iceland, to be educated. Returning to Copenhagen in 1848, he devoted himself to the study of law, but soon turned to literature, in which he ranks high, both as poet and scholar. He has also given evidence of considerable power as a prose-writer. Among other works, he has published *Rosenborg* (1867); *De Danske Kongers Kronologiske Samling* (1870); *Gusle, serbiske Folkesang, paa Dansk* (1875); and *Islandske Folkesang* (1862, 1864, 1867). The two last-mentioned are collections of Serbian and Icelandic folk-tales and ballads. His

largest work is *Genrebilleder* (6 vols.; 1867–79); which has passed through many editions, and been translated into German and other tongues. Died at Copenhagen, Sept. 1, 1883.

ANDERSEN, HANS CHRISTIAN, the most widely popular of Danish authors, and one of the great story-tellers of the world, born at Odense, in Fünen, April 2, 1805, died at Copenhagen, Aug. 6, 1875. The son of a poor shoemaker, he worked for some time in a factory, but his wonderful singing and extraordinary talent soon procured him friends. He went to Copenhagen, hoping to obtain an engagement in the theater, but was rejected because of his lack of education. He next tried to become a singer, but soon found that his heavy face and ungraceful form were not fitted for the stage. Through the assistance of generous friends he was placed at an advanced school, and was thus enabled to remedy his defects of education. Some of his poems, particularly the one entitled *The Dying Child*, had already been well received, and he became better known by the publication of his *Walk to Amak*, a literary satire. He published his first volume of poems in 1830, and in 1831 a second. A traveling pension, granted him by the king in 1833, afforded him opportunities for mental development, and some of its fruits were his *Traveling Sketches*, *Agnes and the Merman*, and *The Improvisatore*. It was through these that he first attained general popularity. In 1840 he made a somewhat lengthened tour in Italy and the East, and 1844 visited the court of Denmark by special invitation, receiving an annuity the following year. Among other works of Andersen may be mentioned *O. T.* (1836); *Only a Fiddler* (1837); a drama entitled *The Mulatto* (1840); *The Story of My Life* (1855); *Tales from Jutland* (1859); and *Tales for Children* (1861). His fame has long been more than European. On his seventieth birthday he was presented with a book containing one of his tales in fifteen languages. See DENMARK, Vol. VII, p. 93.



HANS CHRISTIAN ANDERSEN.

ANDERSON, an important manufacturing town and railroad center of Indiana, and the county seat of Madison County. It is situated on the west fork of White River, 35 miles N. of Indianapolis. Four important railroads center in Anderson, which has a remarkable hydraulic canal with a fall of 44 feet. It is in the heart of the natural-gas belt. Population 1891, 10,741.

ANDERSON, a town of southeastern Texas, capital of Grimes County. It is situated 65 miles N.W. of Houston and 100 miles E.N.E. of Austin. Population 1891, 572.

ANDERSON, ALEXANDER, the father of American wood-engraving, was born in the city of New York, April 21, 1775; educated at Columbia College; became a physician, but soon abandoned medicine, to follow his penchant for engraving. Among his principal works is a fine reproduction of the "Birds" of Thomas Bewick. He died in Jersey City, Jan. 17, 1870.

ANDERSON, CHAPMAN L., was born in Noxubee County, Mississippi, March 15, 1845. He attended the public schools until the beginning of the Civil War, when he entered the Confederate army and served through the successive grades from private to second lieutenant. After the war he entered the law department of the University of Mississippi, and was admitted to the bar in 1868. In 1879 he was elected to the Mississippi legislature, in 1886 to the Fiftieth Congress, and in 1888 to the Fifty-first Congress.

ANDERSON, ELIZABETH GARRETT, born in London, England, in 1837. She studied medicine with much credit at the Middlesex Hospital in 1860, but was prevented from pursuing her studies there by a petition from the students against the admission of women. After experiencing considerable difficulty in qualifying, Miss Garrett passed the Apothecaries' Hall examination with credit in 1865, and the next year received a dispensary appointment. In 1870 she became visiting physician to the East London Hospital, and headed the poll in the election for the London School Board. During this year, also, the University of Paris conferred on her the degree of M.D. She has practiced regularly as a physician for women and children since her marriage to Mr. Anderson, which took place in 1871.

ANDERSON, GALUSHA, born in Bergen, New York, March 7, 1832; educated for the Baptist ministry, he has held pastorates in Brooklyn and Chicago, and from 1878 to 1885 was president of the Chicago University.

ANDERSON, GEORGE B., a Confederate general, born in Wilmington, North Carolina, in 1831; died Oct. 16, 1862. He graduated at West Point in 1852. He commanded the Confederate coast defenses of his native state. He died from the effects of a wound received in the battle of Antietam.

ANDERSON, HENRY JAMES, an American scientist and prominent Roman Catholic, was born in New York in 1799, and was educated at Columbia College, with which he was long identified as professor of astronomy and mathematics. He traveled extensively on the continent of Europe, and in Africa and Asia, and was prominently connected with several scientific expeditions. He died in India, while returning from the transit of Venus expedition to Australia, in 1875.

ANDERSON, JAMES, a Scotch agriculturist and political economist; born near Edinburgh, in 1739; noted as the inventor of an improved plow. His *Essays Relating to Agriculture*, (1777), and a periodical called *Recreations in Agriculture*, in which he forecasted the Malthusian and Ricardoan theory of rent, are among his principal works. Died at Isleworth, Middlesex, England, Oct. 15, 1808.

ANDERSON, JAMES PATTON, a Confederate general, was born in Tennessee about 1819; was lieutenant-colonel of volunteers in the Mexican War; and served with distinction in the Confederate army, attaining the rank of major-general. He died in 1873.

ANDERSON, JOHN, a noted Scotch zoölogist,

born in Edinburgh, Oct. 4, 1833. After holding the chair of natural science in the Free Church College, Edinburgh, he proceeded to India in 1864 as the curator of the Calcutta Museum. He accompanied various expeditions as scientific officer. He retired from the Indian service in 1887. Dr. Anderson has written many zoölogical works, including accounts of his various expeditions.

ANDERSON, JOHN A., born in Washington County, Pennsylvania, June 26, 1834. He graduated at Miami University, Oxford, Ohio, in 1853, and was ordained as a Presbyterian minister four years later. He was made trustee of the California state insane asylum in 1860, and chaplain of the Third Infantry, California volunteers, in 1862, accompanying General Conner's expedition to Salt Lake. He was agent of the United States sanitary commission from 1863 to 1867, and president of the Kansas State Agricultural College from 1873 to 1879. He was appointed a judge by the United States Centennial Commission in 1876, and was elected Republican Congressman from the Forty-sixth to the Fifty-first Congresses, both inclusive. Died in April, 1892.

ANDERSON, JOSEPH, soldier, jurist and statesman, born Nov. 5, 1757, near Philadelphia. He was a student of law when the Revolution began, and, enlisting, was appointed an ensign in the New Jersey line. Made a captain at the battle of Monmouth, he afterward rendered valued service with Sullivan against the Iroquois Indians, was present at Valley Forge and at the siege of Yorktown, at the close of the war retiring with the brevet rank of major. Beginning the practice of law in Delaware, President Washington appointed him territorial judge in 1791. His territory being the region south of the Ohio River, he became prominently identified with the development of Tennessee, taking part in preparing the constitution of that state, and being afterward chosen as United States Senator from 1797 to 1815. At the latter date he was appointed first comptroller of the Treasury, which position he held until 1836. His death occurred in Washington, District of Columbia, April 17, 1837.

ANDERSON, MARTIN BREWER, an American educator, was born in Brunswick, Maine, Feb. 12, 1815; studied theology, and was for some years professor of various branches of study in Waterville College. In 1850 he removed to New York and became editor and owner of the New York *Recorder*, a weekly Baptist journal. Three years later he became president of the University of Rochester, New York. He died at Lake Helen, Florida, Feb. 26, 1890.

ANDERSON, MARY. See NAVARRO, MARY ANTOINETTE (ANDERSON) DE, in these Supplements.

ANDERSON, OPHELIA BROWN, an American actress, was born in Massachusetts in 1813. She acted in juvenile parts at a very early age, and throughout her life was one of the chief favorites of Boston theater-goers. She died in 1852.

ANDERSON, RASMUS BJÖRN, an American writer of Scandinavian descent, was born in Wisconsin in 1846. He was educated in Iowa, and was for some years professor of Scandinavian languages in the University of Wisconsin. He has written numerous works on the history and folk-lore of the Norsemen. He was United States minister to Denmark during President Cleveland's first administration, 1885–89.

ANDERSON, RICHARD HENRY, a Confederate lieutenant-general, was born in South Carolina in 1816, and entered the army from West Point in 1842. He served with distinction throughout the Mexican War. In the Confederate service he was intrusted with important commands, and participated in the battles of Antietam, Gettysburg and Spottsylvania. He died at Beaufort, South Carolina, June 26, 1879.

ANDERSON, ROBERT, soldier; born near Louisville, Kentucky, June 14, 1805; died in Nice, France, Oct. 27, 1871. He graduated at the United States Military Academy in 1825, and served in the Black Hawk war of 1832. Later he became instructor of artillery at West Point, served in the Seminole war, and in 1838 was assistant adjutant general on the staff of General Winfield Scott. In the Mexican War he served as captain, and in the battle of Molino del Rey was wounded. In 1857 he was promoted major of artillery, and on Nov. 15, 1860, was ordered to assume command of Fort Moultrie. He transferred his command of 83 men to Fort Sumter for better defense, leaving the guns at Fort Moultrie spiked and their carriages burnt. On April 13, 1861, Fort Sumter was surrendered to the South Carolinians, after a destructive bombardment. Major Anderson and the officers and men under his command received the thanks of the nation for their courage and patriotic conduct. In May, 1861, he was appointed brigadier-general, organized the volunteer regiments of Kentucky. On Oct. 27, 1863, he retired from active service, on account of ill health, and in 1868 went to Europe. He translated several military text-books from the French, and adapted them to the American service.



ROBERT ANDERSON.

ANDERSON, RUFUS, an American Congregational minister and corresponding secretary of the American Board of Commissioners for Foreign Missions for 34 years. He was born in Maine in 1796, and died in 1880. He spent his life in the interest of foreign missions, traveling, lecturing and writing extensively in that cause.

ANDERSON, WILLIAM, an American soldier and statesman, born in Chester County, Pennsylvania, in 1763. He served through the Revolutionary war, and was present at the battle of Brandywine as colonel on the staff of Lafayette. He was with Washington at Valley Forge, and took part in the battle of Germantown and was at the surrender at Yorktown. From 1809 to 1815 and from 1817 to 1819 he was in Congress, and was afterward a county court judge and collector of customs. His daughter Evelina

married Com. D. Porter. He died in Pennsylvania, Dec. 14, 1829.

ANDERSON, WILLIAM, a noted English civil engineer, director-general of the ordnance factories; born in St. Petersburg, Russia, Jan. 5, 1835, and educated in Russia. After passing a period of instruction as pupil of Sir William Fairbairn, he was for nine years from 1855 the active partner in a contracting firm, building bridges and railroad appliances. Then he became the responsible head of the firm of Easton and Anderson. He contributed extensively to technical literature, and in 1889 was appointed director-general of the royal ordnance factories.

ANDERSON, WILLIAM WARDEN, GENERAL, an English soldier and political officer in India, was born at Surat, in India, in 1824, and entered the Indian army in 1840. He saw much service in the Punjab campaign of 1848, and was severely wounded by the rebels at Gwalior during the mutiny. From 1854 to 1864 he held high office for the Guicowar of Baroda, in addition to his duties as English political agent.

ANDERSON, a village in the northwestern part of South Carolina, county seat of Anderson County, and the local center of the corn and cotton trade. It is situated at the intersection of the Blue Ridge railroad with the Port Royal and Western Carolina railroad, is the seat of the Carolina High School for Boys and Girls, and is drained by the Rocky River, an affluent of the Savannah River. Population 1891, 3,018.

ANDERSON'S UNIVERSITY. See ANDERSON, JOHN, Vol. II, p. 14.

ANDERSONVILLE, a village in Sumter County, Georgia, situated 62 miles S.W. of Macon. It was used by the Confederate states as a military prison from 1864 to the end of the war. It was notorious for its overcrowding, insufficient food supply, and lack of sanitation. Between Feb. 15, 1864, and April, 1865, 49,485 prisoners were received, of whom 12,926 died. The superintendent, Henry Wirtz, was tried by a military commission in 1865 for cruelty and mismanagement, found guilty, and hanged, Nov. 10, 1865. The site of the prison-pen is now a national cemetery. Population of the village in 1895, about 350.

ANDERSSON, KARL JOHAN, an African explorer, born in Sweden, in the province of Wermland, in 1827. In 1850 he made a journey from Walfish Bay through Damaraland to Ovamboland, accompanying Francis Galton, and in 1853–54 continued the exploration alone. On his return to England he published *Lake Ngami; or, Four Years' Wanderings in Southwest Africa*. In 1858 he explored the Okavango River, and in 1866 he set out, with few attendants, on an expedition to the Kunene River. When within sight of the stream he was taken ill, and was obliged to retrace his steps, dying on the homeward journey, in the Ovakuambi region of southern Africa, July 5, 1867.

ANDERSSON, LARS, sometimes called Laurentius Andreæ, a Swedish reformer, was born in 1480. He studied theology in Rome, but afterward at Wittenberg he heard and accepted Luther's teachings. While archdeacon in Strengnäs, he was instrumental in converting King Gustavus Vasa to the principles of the Reformation. Andersson superintended the translation of the New Testament into Swedish (published in folio, 1526), and labored successfully for the introduction of the Reformation into his native country at the diet of Westerås in 1527. He became chancellor of Sweden under Gustavus Vasa, and actively opposed the plan of rendering the church independent of secular power. In 1540, being accused of misprision of treason, he was condemned to death, but the sentence was commuted to fines. The remainder of his life was spent in seclusion at Strengnäs, where he died, April 29, 1552.

ANDERSSON, NILS JOHAN, Swedish botanist, was born at Småland, Feb. 20, 1821, and died in Stockholm, March 27, 1880. He accompanied a Swedish expedition around the world in 1851–53, and on his return published a description of the journey in *A Voyage Round the World* (3 vols.; 1853–54). In 1856 Andersson became professor of botany and curator of the botanical collections in the Academy of Science in Stockholm.

ANDERTON, THOMAS, an English choral compositor. His principal cantatas are *The Song of Deborah and Barak* (1871); a fine setting of Longfellow's *Wreck of the Hesperus* (1882); *The Norman Baron* (1884); and *Yule Tide* (1885). He has taken deep interest in the advancement of choral music in his native land.

ANDESITE, a group of volcanic rocks, gray, reddish, or dark brown in color. The ground-mass of these rocks is usually composed of feldspar-microliths, scattered through which are abundant crystals of plagioclase feldspar. Hornblende and augite, one or both, are generally present, together with magnetite, which is often very abundant. Andesite occurs chiefly in tertiary and more recent strata, and is found in Hungary, Transylvania, Siebengebirge, Santorin, Iceland, the Andes, the western territories of the United States, etc. Many varieties of this rock contain considerable quartz. The name was given by Von Buch to rocks brought by Von Humboldt from the Andes range.

ANDIRA, a genus of plants of the family *Leguminosæ*. The orbicular pod is one-celled and one-seeded. One species, called "cabbage tree," is found in low savannas in the West Indies. It grows to a considerable height, and has pinnate leaves and flowers like lilacs, its bark furnishing a valuable drug. Several other species of the genus contain the same substance.

ANDIJAN, a town in Ferghana, central Asiatic Russia, situated near the Syr-Daria, and 75 miles N.E. of Khokand. It is one of the principal towns on the main caravan routes of central Asia. Population 1891, 30,000.

ANDOVER THEOLOGICAL SEMINARY. See ANDOVER, Vol. II, p. 19.

ANDRAL, GABRIEL, a celebrated French physician and pathologist, born at Paris, Nov. 6, 1797. In 1827 he was appointed professor of hygiene in the University of Paris, succeeding to the chair of pathology in 1830. Andral has been aptly termed the father of analytical and inductive pathology.

He wrote several standard works on pathology. He died in Paris, Feb. 13, 1876.

ANDRASSY, JULIUS, COUNT, an Austro-Hungarian statesmen; born in the county of Zemplin, Hungary, March 8, 1823. His father, Count Charles Andrassy, was an influential member of the national diets, and a publicist of note. Count Julius was a member of the Presburg diet, governor of the county of Zemplin, and an active mover in the revolution of 1848. Just before the collapse of the patriotic cause, Andrassy was sent as minister to Constantinople, and his absence from home doubtless saved his life. Andrassy went to France, and lived there and in England until amnestied in 1857. Returning to Hungary, he soon entered into public affairs, and became Deak's most valued coadjutor. In 1866, when Austria granted the Hungarians an independent parliament, Andrassy became prime minister. His term of office was signalized by the institution of important reforms. In 1871 he succeeded Count Beust as foreign minister of the Austro-Hungarian empire, and was one of the chief factors in the formation of the triple alliance known as the Dreikaiserbund. He represented Austria in the Berlin conference of 1878, and was instrumental in adding Bosnia and Herzegovina to the Austro-Hungarian empire. He resigned his ministerial office in 1879. Died at Volosca, near Fiume, in Istria, Feb. 18, 1890.



COUNT ANDRASSY.

ANDREA, JOHANN VALENTIN, a German Protestant theologian and satirical writer, born at Herrenberg, near Tübingen, in Würtemburg, Aug. 17, 1586. He directed his writings generally against the unsatisfactory condition of the social and religious affairs of his day, and he also argued strongly against the carelessness and the indifference shown to science. He was pastor at Calw in 1620, and court preacher at Stuttgart in 1639. One of his best works is his *Menippus sive Satyricorum Dialogorum Centuria* (1648). He died, June 24, 1654, at Stuttgart.

ANDREA PISANO. See PISANO, ANDREA, Vol. XIX, p. 122.

ANDRÉE, KARL THEODOR, German journalist and geographer; born in Brunswick, Oct. 20, 1808. He received the greater part of his education at the University of Jena, but studied also in Berlin and Göttingen. On his return to his native city he entered the field of journalism. He was afterward editor in Cologne from 1843 to 1846, then for two years at Bremen, and again for a time in his native city. He removed to Dresden in 1855, and in 1858 was appointed consul to Chile. His geographical works relating to America comprise *North America* (1850–51), *Buenos Ayres and the Argentine Republic* (1856), and numerous articles in *Das Westernland* and other journals. In 1859 he published an account of recent explorations, entitled *Geographical Wanderings*, and afterward a *Commercial Geography*. He died at Wildungen, Aug. 10, 1875.

ANDRÉE, RICHARD, German author, son of the preceding, was born in Brunswick, Feb. 26, 1835. He studied at Leipsig. During the years of 1859–63 he was engaged in business in Bohemia, and participated in the contest between the Germans and the Czechs. His writings are principally on subjects connected with questions of race. Among his published works are *Nationalitäts-Verhältnisse und Sprachgrenze in Böhmen* (1871); *Tschechische Ganze* (1872), and *Wendische Wanderstudien* (1874). He has also published some noteworthy articles in geographical periodicals.

ANDREW, JAMES OSGOOD, an American divine; born in Wilkes County, Georgia, May 3, 1794, and became an itinerant Methodist Episcopal preacher of South Carolina conference, being consecrated bishop in May, 1832. From his social relations began the division of the Methodist Episcopal Church into "North" and "South." His second wife was a slaveholder, and in the general conference of 1844 it was declared that "this would greatly embarrass the exercise of his office, if not in some places entirely prevent it," and it was resolved that "he should desist from the exercise of this office so long as this impediment remains." The Southern delegates protested, and the difficulty was finally settled by dividing the churches and property into the Northern and Southern jurisdictions. Bishop Andrew adhered to the South, and continued his episcopal work until 1866, retiring then from age. He died at Mobile, Alabama, March 2, 1871.

ANDREW, JOHN ALBION, an American statesman, and war governor of Massachusetts, born in Albion, Maine, May 31, 1818. He graduated at Bowdoin, studied law at Boston and was admitted to practice. He became prominent as an anti-slavery man, and was elected to the legislature in 1858. In 1860 he was a delegate to the Republican convention at Chicago which nominated Abraham Lincoln for President, and in the same year was elected governor of Massachusetts. To this office he was annually re-elected until 1866, when he declined the nomination. In January, 1861, as soon as he was inaugurated, he began to prepare for the possibility of war by reorganizing the militia. Within a week after the President's proclamation of April 15, 1861, he had dispatched five regiments of infantry, a battalion of riflemen and a battery of artillery to Washington. In September, 1862, he attended the convention of the governors of the loyal states at Altoona, Pennsylvania, and drew up the address they presented to the President. In January, 1863, he obtained permission from the War Department to enlist negro troops. He died in Boston, Oct. 30, 1867.



JOHN ALBION ANDREW.

ANDREW, JOHN FORRESTER, United States Congressman, born in Hingham, Massachusetts, Nov. 24, 1850. He graduated at Harvard College in 1872, and was admitted to the bar in 1875. He served three successive terms in the Massachusetts house of representatives, and two terms in the state senate. He was elected to the Fifty-first and Fifty-second Congresses as a Democrat.

ANDREW, CROSS OF SAINT. A white saltire on a blue ground, to represent the X-shaped cross on which the patron saint of Scotland is said to have suffered martyrdom, has been from an early date adopted as the national banner of Scotland. It is combined with the crosses of St. George and St. Patrick in the union jack. The Scottish Order of the Thistle is sometimes known as the Order of St. Andrew. See ANDREW, SAINT, Vol. II, p. 20.

ANDREW, ORDER OF SAINT, an order composed of Russian knights of the highest rank, founded in 1698 by Peter the Great. The order includes members of the imperial family. The badge is mounted with a cross enameled in blue, upon which is carved a crowned figure of St. Andrew, and in the four corners of the badge are the letters S.A.P.R. (*Sanctus Andreas Patronus Russiæ*). An eagle displayed decorates the other side, beneath which is a short Russian legend. The Scotch Order of the Thistle, so called from the thistle, which is the Scottish heraldic badge, is often called the Order of St. Andrew.

ANDREWS, CHARLES, an American jurist; born at Whitestown, Oneida County, New York, in 1827. He was admitted to the bar in 1849; was mayor of Syracuse in 1861–62 and in 1868; was elected associate justice of the New York court of appeals in 1870, being chosen chief justice in 1881. Judge Andrews has been prominent in the political councils of the Empire State.

ANDREWS, CHRISTOPHER COLUMBUS, American lawyer; born in Hillsboro, New Hampshire, Oct. 27, 1829. He studied law, was admitted to the bar in 1850, and followed his profession in Newtown for two years. He went to Washington, served in the Treasury Department two years, and later settled at St. Cloud, Minnesota, where he was elected to the state senate. At the beginning of the war he enlisted as a private, but was commissioned captain in the Third Minnesota Infantry. He was made prisoner in a fight near Murfreesboro, Tennessee, July, 1862; was exchanged four months later and appointed lieutenant-colonel of his regiment. During the war he served in numerous important battles, and finally attained the rank of major-general. In 1869 he was appointed United States minister to Sweden and Norway, and served until 1877. He was supervisor of the United States census in the third district of Minnesota in 1880, and for three years from 1882 was consul-general to Brazil. General Andrews has published *Minnesota and Dakota* (1856); *Practical Treatise on the Revenue Laws of the United States* (1858); *Hints to Company Officers on their Military Duties* (1863); *History of the Campaign of Mobile* (1867); and *Digest of the Opinions of the Attorneys-General of the United States* (1867).

ANDREWS, EBENEZER BALDWIN, an eminent American geologist, was born in Connecticut in 1821, and died in 1880. His literary works are mostly geological.

ANDREWS, EDMUND, a distinguished American surgeon and writer, was born in Vermont in 1824. He has been prominent as a surgical educator in Michigan and Illinois, and was one of the founders of the Chicago Medical College.

ANDREWS, EDWARD GAYER, an American bishop of the Methodist Episcopal Church, was born in New York state Aug. 7, 1825; became president of Cazenovia Seminary in 1855, and was consecrated bishop in 1872.



E. G. ANDREWS.

ANDREWS, ELISHA, an American Baptist minister and religious controversialist, was born in Middletown, Connecticut, Sept. 29, 1768. He was the author of many polemic and controversial books in defense of the Baptists' tenets. He died Feb. 3, 1840.

ANDREWS, ELISHA BENJAMIN, an American educator, born at Hinsdale, New Hampshire, Jan. 10, 1844. He went to the defense of the Union in 1861, rose to the rank of second lieutenant and lost an eye at Petersburg. He graduated at Brown University in 1870, and entered Newton Theological Seminary, where he prepared for the ministry. He was ordained a Baptist minister, and for four years engaged in pastoral work. He then became connected with Denison University, and later was called to Brown University as professor of history and political economy. In 1888 he accepted the chair of political economy and finance at Cornell University, but had been there only one year when he was elected president of Brown University. President Andrews was one of the commissioners representing the United States at the Brussels bimetallic conference in 1892. He is the author of several standard text-books.



E. B. ANDREWS.

ANDREWS, ETHAN ALLEN, an American educational writer, was born in New Britain, Connecticut, April 7, 1787. After graduation at Yale, he was admitted to the bar and practiced for several years. The study of ancient languages attracted him, so that in 1822 he was appointed

professor in the University of North Carolina. Holding various other chairs of languages until 1839, he returned to Connecticut and commenced to publish many valuable Latin text-books, the principal one of which was his *Latin-English Lexicon*. He died in his native town, March 4, 1858.

ANDREWS, GEORGE L., an American general, was born in Massachusetts in 1828, and graduated first in his class at West Point in 1851. He served throughout the Civil War, and was twice promoted for distinguished services with the army of the Potomac. In 1871 he was called to the chair of French, and in 1882 to that of modern languages, at West Point Military Academy.

ANDREWS, JOSEPH, an American engraver; born at Hingham, Massachusetts, Aug. 17, 1806. His early inclination toward an artistic career led him, at the age of 15 years, to study wood-engraving with Abel Owen, of Boston. His teacher in the branch of copper-plate engraving was Hoogland. After studying in London and Paris, he began to issue his famous engravings. Of these, his *Head of Washington*, after Stuart's painting, and *Plymouth Rock, 1620*, after P. F. Rothermel, are classed among the finest American engravings. He died at Hingham, May 9, 1873.

ANDREWS, LOREN, an American educator, president of Kenyon College, was born in Ohio in 1819. He is regarded as the father of Ohio's common-school system. On the attack on Sumter, President Andrews raised a company of volunteers, soon being elected colonel of the Fourth Ohio. He died from a fever, brought on by exposure, at Gambier, Ohio, Sept. 18, 1861.

ANDREWS, LORRIN, an American missionary, was born in Connecticut in 1795. He devoted his life to missionary work in Hawaii, was a judge and privy councilor in the island, and prepared many books for the religious education of its inhabitants, including Hawaiian editions of parts of the Bible. He died at Honolulu, Sept. 29, 1868.

ANDREWS, NEWTON LLOYD, an American educator, born at Fabius, New York, Aug. 14, 1841. He was educated at Colgate and Hamilton colleges; was for five years from 1864 the principal of Colgate Preparatory School. In 1868 he was chosen to fill the chair of Greek language and literature in his *alma mater*, being dean of the faculty from 1880 to 1892.

ANDREWS, SAMUEL JAMES, an American clergyman, born in Danbury, Connecticut, July 21, 1817. He graduated at Williams College in 1839, and later was admitted to the bar. In 1846 he gave up the practice of law and was ordained in the Congregational ministry, but was compelled to give up preaching, on account of throat trouble, and became an instructor in mental and moral philosophy in Trinity College. He at last adopted the Irvingite doctrines, and became, in 1868, pastor of the Catholic Apostolic Church, in Hartford, Connecticut. His only publication is *The Life of Our Lord on Earth* (1863); republished in England and translated on the Continent.

ANDREWS, SHERLOCK JAMES, an eminent American jurist, was born in Wallingford, Connecticut, Nov. 17, 1801. He removed to Ohio in 1825, where he became prominent as a lawyer and held many important offices. For some time he and the famous Thomas Corwin shared the honors of leading the Ohio bar. He died in Cleveland, Ohio, Feb. 11, 1880.

ANDREWS, THOMAS, an English chemist; born in Belfast, Ireland, 1813. He filled the chair of chemistry in Queen's College, Belfast, from 1849 till 1879. His researches were more of a physical than of a chemical nature, being on the heat in combustion of various classes of substances, on the nature of ozone, and on the continuity of the liquid and gaseous states of matter. He was president of the British Association at Glasgow in 1876. He died in Belfast, Nov. 26, 1885.

ANDREWS, THOMAS, an English engineer and manufacturer, of Sheffield, England, was born in that town in 1847. He succeeded his father as proprietor of the Wortley Iron Works in 1871, and has since rendered eminent service to physical and engineering science by researches and experiments on the properties and phenomena of iron, steel, etc., and particularly in their relations to thermal and electrical forces. His published reports and works are numerous and valuable, besides which he has been a valued contributor to *The Engineer* and other technical journals.

ANDRIEUX, LOUIS, a French statesman and journalist; born at Trévoux, in the department of Ain, July 20, 1840; in 1870 he was sentenced to a brief imprisonment for disrespectful utterances against Napoleon III. He was chosen public prosecutor at Lyons on the birth of the republic. Entering on a political career as a representative of Lyons, his strictures on Paul de Cassagnac provoked a pistol duel on March 12, 1878. He was prefect of police at Lyons in 1879. In 1882 M. de Freycinet sent him as temporary ambassador to Madrid. Since that date he has been repeatedly returned as member of the chamber of deputies for divers departments of France.

ANDROMEDA, a genus of plants of the family *Ericaceæ*. The species are hardy, evergreen shrubs, natives of North America, Europe and Asia, the well-known *A. polifolia* being common to both hemispheres. The flowers are showy, and some species are cultivated for ornament. They possess narcotic properties, and some are reputed to be poisonous to sheep, as *A. Mariana* ("stagger-bush"), *A. polifolia* and *A. ovalifolia*. The genus has a five-valved capsule, splitting up through the back of each cell; the anthers have two awns, and the corolla has a contracted orifice.

ANDROPHYTE, a term applied to a gametophyte which bears the male sexual organs only. In all heterosporous plants the gametophytes are sexually differentiated, this condition often being designated by the term *diœcious*.

ANDROS, SIR EDMUND, colonial governor, born in London, England, Dec. 6, 1637; died there, Feb. 24, 1714. In 1672 he was appointed major under Prince Rupert, and in 1674 he succeeded his father as bailiff of the island of Guernsey; a few months later he was made governor of New York.

Andros was familiar with the French and Dutch languages, and devoted to his patron, the Duke of York. To further the duke's interest he endeavored to extend the limits of the duke's province to the Connecticut River on one side and to the Delaware on the other; he also endeavored to detach the five tribes of Mohawk Indians from the French influence. In 1678 he visited England, where he was knighted by Charles II. When James II became king, an attempt was made to consolidate the New England colonies into one royal province, and Andros was appointed governor-general. In December, 1686, he arrived at Boston, and began his administration with a set of new laws and regulations. Connecticut refused to surrender its charter to the new governor, and in October, 1687, he marched to Hartford with a body of 60 soldiers to enforce his command. He was unsuccessful in obtaining the delivery of the charter, which was carried away from the meeting of the assembly and hidden in the famous "Charter Oak" tree of that city. Some months later, New York and New Jersey were added to his jurisdiction, when he appointed Francis Nicholson lieutenant-governor of New York. Soon afterward the operations against the French in Maine brought on a war with the Penobscot Indians, for which the people were additionally taxed. On April 18, 1689, the magistrates removed by Andros published a proclamation denouncing his tyranny, and appointed Simon Bradstreet governor. Andros and some of his subordinates were arrested and imprisoned, and agents were sent to King William to request the restoration of the former charter. Andros several times attempted to escape from confinement, and in July was sent to England, where a formal complaint was made against him; but he was discharged without trial. In 1692 he was made governor of Virginia. Here he became popular with the planters, to whom he recommended the introduction of manufactures and the cultivation of cotton. Andros had brought with him the charter of William and Mary College, and took measures for the preservation of documents relating to the early history of Virginia. Later, he got into difficulties with Dr. Blair, the founder of the college, through whose influence Andros was recalled to England in 1698. From 1703 to 1706 he was governor of the island of Guernsey.

ANDROS, THOMAS, an American patriot, born at Norwich, Connecticut, in 1759, was for 40 years a preacher at Berkley, Massachusetts. At the age of 16 years he joined the Continental army and took part in the battles of Long Island and White Plains. In 1781 he enlisted on a privateer in New London, was captured and confined in the *Jersey* prison-ship in New York, but escaped a few months later and became a student of theology. He was ordained pastor of the church at Berkley in 1788, where he remained for 46 years. He published many sermons, and also a narrative of his imprisonment and escape. He died in Berkley, Massachusetts, Dec. 30, 1845.

ANEGADA, the most northerly of the Virgin Isles, in the Leeward or Lesser Antilles group, in the West Indies. Situated east of Porto Rico, it contains about 13 square miles, with a scanty population of 200, mostly peasant proprietors. Sugar and cotton, in small patches, are the only products. The island is of coral formation and is beset by reefs. Formerly notorious for shipwrecks, a Board of Trade lighthouse on the neighboring island of Sombrero has done much to warn ships. Anegada is a British possession, attached administratively to the Leeward Island group.

ANEMOMETER. Robinson's anemometer has been the most favored form of wind-gauge in use for many years. As ordinarily constructed, it consists of four hollow hemispheres or cups, mounted in the ends of crossed rods, in a horizontal plane, in such manner as to be rotated by the force of the wind. The recording mechanism is contained in a box below, being operated through a perpendicular shaft. In 1893 Professor S. P. Langley, of the Smithsonian Institution, desired a lighter form, in order to study the irregularities of wind-pressure. The ordinary form produces something of the action of a fly-wheel, and thus fails to record minute variations in the speed of the wind. Its moment of inertia was found to be approximately 40,000 gr. $cm^2$. Professor Langley built one in which the weight of the arms and cups was reduced from 241 to 74 grams, and the moment of inertia to 8,604 gr. $cm^2$. This blew away in a gale, but was esteemed hardly light enough, so one was finally constructed of half the diameter of the standard pattern, and with paper cones substituted for the hemispherical cups. Then the moment of inertia was found to be reduced to only 300 gr. $cm^2$. It was next necessary to produce the record more frequently, the standard instruments making a record only once in 25 rotations. By making use of the astronomical chronograph, Professor Langley was able to obtain records every half-revolution.

The records produced by this specially light form of anemometer demonstrated, what Professor Langley had suspected to be the case, that the wind was subject to the most rapid changes of velocity, the variations being so quick as to have escaped previous observation. He found that changes of velocity from 20 to 30 miles an hour and back again, or to higher and lower points, were of the commonest occurrence within a few seconds of time. One of the record-charts of this instrument, taken Feb. 4, 1893, showed 11 changes of speed, amounting each to 10 or more miles an hour, within a space of 10 minutes, and at one point on the record, during 15 seconds, there appear these changes: from 12 to 30 miles an hour, from 30 to 19, from 19 to 34. These results were obtained with the anemometer set to register once for each rotation of the cups. C. H. C.

ANEMONE, a genus of *Ranunculaceæ*, containing numerous and generally beautiful species. Most of them flower early in the spring, and are natives of temperate and cold climates, chiefly of the northern hemisphere. North America has

numerous native species. One, *Anemone nemorosa*, the wood-anemone, or wind-flower, is a common native of all parts of Britain, and its white flowers, externally tinged with purple, are an ornament of many a woodland scene and mountain pasture in April and May; and it is also common in parts of North America. Another species, *Anemone Pulsatilla*, the pasque-flower, has flowers which are purple, and externally silky. The garden-anemone is a favorite florist's flower; the varieties, both single and double, are very numerous, but are chiefly traceable to two species (*Anemone Coronaria* and *Anemone hortensis*), though other forms are constantly being introduced, of which *Anemone Japonica* may be especially mentioned, and whole works have been published on them and their cultivation, which has long been most extensively carried on in Holland. The genus Hepatica is frequently included in Anemone. *Anemone triloba* (*Anemone Hepatica*), with three-lobed leaves, is common in America. Varieties of different colors, and both single and double, are among the finest ornaments of our flower-borders in early spring. See HORTICULTURE, Vol. XII, p. 253.

ANEMONE, SEA, a popular name for the flesh-corals (*Actiniidæ*). Unlike their allies, the true corals, they do not deposit a calcareous skeleton. They are found abundantly at low tide, attached to rocks, piles, etc. For an account of their structure, see also ACTINOZOA, Vol. I, pp. 129–131, and CORALS, Vol. VI, pp. 369–372.

ANEMOPHILOUS, a term applied to those flowers which depend upon the wind as an agent for the transfer of pollen to stigma. Such flowers, as a rule, are inconspicuous, with little or no color or odor, but usually produce an excessive amount of pollen, as in pines, grasses, etc. The term is used to distinguish them from entomophilous flowers, in which insects are used as the agents of transfer.

ANEMOSCOPE, an instrument for rendering visible the direction of the wind. It is usually composed of an index placed at the base of a horizontal axis, supported by an upright staff, on top of which is an ordinary wind-vane, upon which the wind acts. Some anemoscopes record the slightest change in the wind, even in the absence of the observer, by marks on a dial-plate on which the 32 points of the compass are engraved.

ANEROID (Gr. *a* priv., and *nēros*, wet), the name given to a barometer which determines the density of the air without the aid of a liquid. See BAROMETER, Vol. III, p. 383.

ANEURIN, a Welsh poet (603), who, according to the received account, was the son of Caw ab Geraint, chief of the Otadini. Some have, however, identified him with Gildas, the British historian, while Stephens makes him Gildas's son. After being educated at St. Cadoc's College, at Llancarvan, he joined the bardic order; was present at the battle of Cattraeth as bard and priest, and in his poem *Y Gododin*, he mentions the hardships he endured as a prisoner. His *Y Gododin*, an epic poem, contains, in its present form, more than 900 lines. See CELTIC LITERATURE, Vol. V, p. 317.

ANGEIOLEUCITIS. See ADENITES, in these Supplements.

ANGEL, BENJAMIN FRANKLIN, an American lawyer and diplomatist; born in Burlington, Otsego County, New York, Nov. 28, 1815. He studied law, was admitted to the bar, and in 1838 was appointed surrogate, serving for four years. In 1842 he was appointed master in chancery and supreme court commissioner, and in 1844 he again became surrogate. He was a member of the Democratic national convention in 1852, and the succeeding year he became United States consul to Honolulu, Sandwich Islands. President Pierce sent him on a special mission to China in 1855. In 1856 he was appointed minister to Norway and Sweden, and on his return in 1862 gave up politics and devoted himself to agriculture. He was president of the New York State Agricultural Society in 1873–74.

ANGELA, MERICI, OF BRESCIA, a Franciscan nun, and founder of the order of the Ursulines; born in Lombardy, Italy, in 1470; died in 1540. The association of the Twelve Maidens, of which she was made superior, organized in 1535, under the patronage of Saint Ursula, was at first a benevolent society, but very soon became a religious order, and was confirmed by the pope in 1544.

ANGEL-FISH (*Rhina Squatina*), a very indefinite popular name which is applied to fishes of no less than three genera. However, it is more often applied to a fish allied to sharks, and belonging to the genus *Squatina*. This is a broad, flat fish about four feet wide by seven or eight long. It is found on the coasts of France, Britain and the southern United States. Also called the monk-fish. See ICHTHYOLOGY, Vol. XII, p. 686; SHARK, Vol. XXI, p. 776.

ANGELICA, a large genus of *Umbelliferæ*, occurring in north temperate latitudes in both hemispheres. Like most of the family, it contains aromatic substances, for which it has been somewhat cultivated.

ANGELICA TREE AND HERCULES'S CLUB, trivial names applied to *Aralia spinosa*, a small shrub-like tree of the eastern United States, common in cultivation, and noted for its large compound leaves and very prickly stems and branches. Its white flowers are in large terminal umbel-like clusters. Preparations from its berries are somewhat used medicinally.

ANGELICO, FRA. See FIESOLE, Vol. IX, pp. 149, 150.

ANGELL, HENRY C., an American oculist, born in Providence, Rhode Island, Jan. 27, 1829. He graduated at Hahnemann Medical College of Philadelphia in 1853, and for the succeeding four years studied in London, Paris, Vienna, and Berlin. Since the foundation of the Boston University School of Medicine he has been professor of ophthalmology in that institution. He is a member of various scientific societies, and has published *Diseases of the Eye; How to Take Care of Our Eyes;* and numerous papers on art subjects.

ANGELL, James Burrill, LL.D., an American educator; born in Scituate, Rhode Island, Jan. 7, 1829. He graduated at Brown University in 1849, spent four years in Europe, traveling and studying, and on his return became professor of modern languages in his *alma mater*. From 1860 to 1866 he was editor of the Providence *Daily Journal*, when he became president of the University of Vermont. In 1871 he was called to the presidency of the University of Michigan, which office he has continued to fill. In 1880 he received leave of absence, in order to become envoy extraordinary and minister plenipotentiary to China, with a commission to procure a revision of the treaties between the United States and China. He returned in 1881, after eighteen months spent in this important work, to resume his educational duties. He is a Regent of the Smithsonian Institution. Appointed minister to Turkey in 1897.


J. B. ANGELL.

ANGELL, Joseph Kinnicut, an American legal writer; born in Providence, Rhode Island, April 30, 1794; died in Boston, May 1, 1857. He graduated at Brown in 1813, and three years later was admitted to the bar. Among his publications are *A Treatise on Corporations; Treatise on the Right of Property in Tide-Waters; Inquiry Relative to an Incorporeal Hereditament; A Practical Summary of the Law of Assignment; On Adverse Enjoyment; Treatise on the Common Law in Relation to Watercourses; Treatise on the Law Concerning the Liabilities and Rights of Common Carriers; A Treatise on the Law of Fire and Life Insurance; Treatise on the Limitation of Actions at Law and Suits in Equity and Admiralty;* and *A Treatise on the Laws of Highways.*

ANGELN, a small district in the province of Schleswig-Holstein, Prussia, between Flensburg Fiord and the Schlei, noted for its fertility, and supposed to be the home from which came the Angles who invaded England in the fifth century. The principal place is Kappeln.

ANGELUS DOMINI, a form of prayer addressed by Roman Catholics to the Virgin Mary, in memory of the birth of Christ, beginning with the *Ave Maria* and continued with three passages of Scripture repeated at intervals with this salutation. The bell, called the Angelus bell, is tolled regularly three times a day, at morning, noon and sunset, to invite the people to repeat this prayer. The subject has found the theme for Millet's famous picture.

ÄNGERMANLAND, the name of an ancient political division of the kingdom of Sweden, corresponding at the present day with the southern portion of the län of Vesternorrland and the entirety of Vesterbotten. It is drained by the Angermannelf, a majestic stream rising on the eastern slopes of the Kiölen Mountains, and which, after a course of 200 miles through lakes and over many falls, empties itself in the Gulf of Bothnia, near Hernösand. The district is considered one of the most beautiful of scenic Sweden. See also Angermann, Vol. II, p. 29.

ANGHIERRA, Pietro Martir d', an Italian scholar and courtier; born at Anghierra, in the district of Milan, Italy, Feb. 2, 1455. At the age of 32 he entered the service of Isabella, queen of Spain. He founded a school for the children of the Spanish nobility in Madrid during 1492; was tutor to the royal princes and ambassador to the doge of Venice and to Egypt. He was chosen a member of the council of the Indies in 1524, and held other important court offices. His *De Orbe Novo*, dealing with the events of the first thirty years of American discovery, and his letters, are still of historical value. Died in Valladolid, in 1526.

ANGIOSPERMOUS (Gr. *angeion*, a vessel; *sperma*, seed), in botany, a term applied to phanerogamous plants which have their seeds inclosed in a pericarp; or, more strictly, those plants in which the ovule is inclosed by the carpel. This is the case with one great division of flowering or seed plants, called, in consequence, *Angiosperms*. Those which have uncovered seeds, as the *Coniferæ* are called gymnospermous, forming the division known as *Gymnosperms*.

ANGLE, James Lansing, an American jurist; born at Henrietta, Monroe County, New York, Dec. 19, 1818; called to the bar in 1845. He was appointed a justice of the supreme court of the Empire State in 1877, was re-elected for a full term in 1883, and at the close of 1888 retired on reaching the age limit. He died at Greece, New York, May 4, 1891.

ANGLER or SEA-DEVIL. See Devil-fish, Vol. VII, p. 138.

ANGLESEY, Henry William Paget, Marquis of, an English general and cavalry officer; born May 17, 1768. Under the title of Earl of Uxbridge, he commanded the cavalry brigade at Waterloo and lost a leg in the charge. He was created Marquis of Anglesey on his return home. Appointed lord-lieutenant of Ireland in 1828, he was removed by the Duke of Wellington for favoring Catholic emancipation. He was viceroy again from 1831 to 1833, and was promoted to a field-marshal's baton in 1846. He died April 29, 1854.

ANGLESITE, a sulphate of lead, named from Anglesey, the place of its discovery. See Mineralogy, Vol. XVI, p. 400.

ANGLIA, East, a kingdom founded by the Angles about the middle of the sixth century, in the eastern part of central England, in what now forms the counties of Norfolk and Suffolk. See England, Vol. VIII, p. 270.

ANGLO-CATHOLIC, a term used of the Church of England generally, but especially by the High Church section, which claims that the national church is Catholic (as opposed to Roman Catholic), and discards the name of Protestant.

ANGOLA, capital of Steuben County, in the extreme northeastern portion of the state of Indiana, is situated on the line of the Lake Shore and Michigan Southern railway, 40 miles N. of

Fort Wayne. It has woolen mills and barrel and stave factories. A state normal school is located here. Population 1890, 1,840.

ANGOLA. Same as Portuguese West Africa. See AFRICA, in these Supplements.

ANGORA GOAT. See GOAT, Vol. X, p. 708.

ANGOSTURA BARK OR CUSPARIA BARK, the aromatic bitter bark, chiefly of the *Galipea Cusparia*, a native of Venezuela and other tropical countries. It derives its name from the town of Angostura, where it is a considerable article of commerce. The *Galipea Cusparia* is a shrub or small tree belonging to the *Rutaceæ*, and flourishing at an elevation of 600 to 1,000 feet above the sea. Angostura bark is a tonic useful in dyspepsia, dysentery, etc. Formerly used as a febrifuge, and still entering into the composition of various "bitters." The dangerous "false Angostura bark" drove it from use for a time.

ANGOULÊME, LOUIS ANTOINE DE BOURBON, DUC D', born at Versailles, Aug. 6, 1775. He was the eldest son of Charles X of France, (Comte d'Artois) and Maria Theresa of Savoy, Princess of Sardinia. In 1792 he led a force of French into Germany, but made a failure of the campaign, and was banished. He remained in exile until 1814, when, with the allies, he returned to France, entering Bordeaux, under British protection, March 12th. When Napoleon returned from Elba he was sent in haste, with such forces as he could collect, to oppose him; but he failed in the attempt, was deserted by his troops, and sent as a prisoner to Barcelona. Subsequently he invaded Spain in 1823, and restored Ferdinand VII to power. In the Revolution of July, 1830, he and his father were sent into exile. He died at Görlitz, June 3, 1844.

ANGOULÊME, MARIÉ THÉRÈSE CHARLOTTE, DUCHESSE D', wife of the preceding; born at Versailles, Dec. 19, 1778. She was a daughter of Louis XVI, and was, with her father and her mother, the hapless Marie Antoinette, confined in the Temple. Released in 1795 in exchange for sansculottes captured by the Austrians, she spent many years in exile. She died in Vienna, Oct. 19, 1851.

ANGRA PEQUENA OR LÜDERITZ BAY, a bay on the southwest coast of Africa, in lat. 26° 38′ S., and long. 14° 55′ E. It gives name to the southern littoral of Great Namaqualand, a sandy, waterless region, but apparently rich in minerals, and having a healthy climate. In 1883 Angra-Pequena was ceded by a Namaqua chieftain to Lüderitz, a Bremen merchant, and the next year it was taken under German protection, with all the coast to the north as far as Cape Frio, except Walfish Bay, which belongs to England. See AFRICA, in these Supplements.

ÅNGSTRÖM, ANDERS JONAS, a Swedish natural philosopher; born at Lödgö, in Vesternorrland, Sweden, Aug. 13, 1814; died June 21, 1874. In 1833 he entered the University of Upsala, where he became a privat-docent (1839), keeper of the observatory (1843), and professor of physics (1858). From 1867 till his death he acted as secretary to the Royal Society of Sciences at Upsala. His works embrace the subjects of heat, magnetism, and especially optics. His *Recherches sur le Spectre Solaire* (Berlin, 1869,) was an important supplement to Kirchoff's great work on the solar spectrum. Other works were *Sur les Spectres des Gas Simples* (1871), and *Mémoire sur la Température de la Terre* (1871).

ANGUILLULA, a genus of round worms or *Nematoidea*, examples of which are found in vinegar, sour paste, and blighted wheat. They are remarkable for tenacity of life, some being able to withstand great heat and dryness, and others, as the vinegar-eel, can resist strong chemicals for a surprisingly long time. They are related to the horsehair-worms (*Gordiidæ*.)

ANGUIS, a perfectly harmless animal belonging to the lizard family. The slowworm, or blindworm, which occurs in all parts of Europe, is a typical example. This animal is neither blind nor a true worm. Its eyes are very small, and no external limbs are present.

ANGULAR MOTION, in physics, the movement of a body about a fixed central point. The movement of a pendulum is called angular motion, because it is measured by the angle formed by the supposed line drawn from the common point to the different points of its motion.

ANGULO, PEDRO DE, missionary; born in Burgos, Spain, about 1500; died in 1562. He set out for America, and, after some years spent in a Dominican convent in Mexico, was ordained priest. In 1541, he was sent to Guatemala, and about 10 years later directed his efforts to the conversion of the people who lived north of there, and in company with two missionaries finally succeeded in converting the entire nation.

ANGUS, JOSEPH, an English clergyman; born Jan. 16, 1816. He graduated at Edinburgh University in 1836, and took the first prize in mathematics, in Greek, in logic, in belles-lettres, the gold medal in ethics and political philosophy, and a prize of one hundred guineas for the best essay on the influence of the writings of Lord Bacon. He studied theology at Stepney College, and was ordained pastor of the Baptist Church in New Park Street, Southwark. He received a hundred guineas as a prize for an essay in reply to Rev. Dr. Chalmers's defense of church establishments; a prize for a series of lectures on *The Advantages of a Classical Education as an Auxiliary to a Commercial Education;* one for an essay called *Christ Our Life;* and another for an essay on the *Nature, Growth and Representation of the Church.* In 1840 he was appointed secretary of the Baptist Missionary Society, resigning in 1849 to become president of Stepney College. For many years he was the English examiner in the University of London and for the Indian civil service. He was one of the revisers of the English New Testament and a member of the Evangelical Alliance.

ANGUS, SAMUEL, an American naval officer; born in Philadelphia in 1784. Entering the service in 1799, he saw arduous service in the early days of the United States navy. In two encounters

with the French he was severely wounded, and again in fighting the English in the war of 1812. His ship carried Adams and Clay to negotiate the Treaty of Ghent. His wounds impaired his reason, so much so that he was dismissed the service in 1824. He died in Geneva, New York, May 29, 1840.

ANHALT. This duchy of Germany has a constitution, proclaimed Sept. 17, 1859, and modified by decrees of Sept. 17, 1863, and Feb. 13, 1872. It gives legislative power to a diet composed of 36 members, of whom 2 are appointed by the duke, 8 are representatives of landowners who pay the highest taxes, 2 of the highest-taxed inhabitants belonging to the mercantile and industrial classes, 14 of the other inhabitants of towns, and 10 of the rural districts. The executive power is entirely in the hands of the duke, who governs through a minister of state. The present Duke of Anhalt is Friedrich, who succeeded to the duchy April 22, 1871. The duchy comprises an area of 906 English square miles, with a population of 271,963 at the census of Dec. 1, 1890. In 1875 the population was 213,565, and in 1880 it was 232,592. From 1875 to 1880 the increase was at the rate of 1.78 per cent per annum, and from 1880 to 1890 at the rate of 1.34 per cent per annum. Of the population in 1890, 134,052 were males, and 137,904 (or 102.9 per 100 males) were females. The capital, Dessau, had 34,658 inhabitants in 1890. Nearly the whole of the inhabitants belong to the Reformed Protestant Church, there being 8,875 Catholics and 1,580 Jews. Of the population, 32,932 are actively engaged in agriculture. There were 185 miles of railway in April, 1892. See also ANHALT, Vol. II, p. 47.

ANHALT-BERNBURG, CHRISTIAN, PRINCE OF, a German military commander, born in 1568. At the head and front of the Protestant princes, he was the principal in the formation of the league against the emperor in 1608. He led the army of the elector palatine Frederick which suffered defeat before Prague in 1620. He died in 1630.

ANHALT-DESSAU, LEOPOLD, PRINCE OF, a Prussian field-marshal, familiarly known to his men as "Der Alte Dessauer," (the old Dessauer). Born at Dessau, July 3, 1676, he commanded the Prussians under Prince Eugene in the campaigns in Italy and Flanders (1706–12). For his services at Hochstädt, Blenheim, Cassano and Turin, he received a field-marshal's baton in 1712. As second in command, he led the Prussians against Charles XII of Sweden, and captured Rügen in 1715; was present at the victories of Neustadt, Jägerndorf and Kesselsdorf in 1745. He died at Dessau in April, 1747.

ANHINGA (*Plotus anhinga*), a bird allied to the cormorants, common in the swamps of the southern United States. It is also known as snake-bird, water-turkey or darter. It is easily alarmed, and is a swift flyer and expert diver. The name *snake-bird* refers to the extremely long, slender neck.

ANHOLT, an island belonging to the kingdom of Denmark, and situated in the Cattegat, 47 miles N. of Zealand, and in lat. 56° 44′ N., long. 11° 39′ E. It has a lighthouse to warn mariners of the encircling shoals. The island is 7 miles long, with an average width of 4 miles. Population 1895, 200.

ANHYDRITE. It is of no great value for building, on account of its tendency to change; but some of its varieties, especially the siliciferous or vulpinite, found at Vulpino, in Upper Italy, are used for sculptures, and take a fine polish. See MINERALOGY, Vol. XVI, p. 400.

ANI OR ANNI, a ruined city of Turkish Armenia. In the tenth century it was the capital of the Bagratide kings of Armenia. Afterward it was taken and sacked by Alp Arslan, and in the fourteenth century it was destroyed by an earthquake. Numerous ruins of buildings and massive walls remain. It is situated 28 miles E. by S. of Kars.

ANIL. See INDIGO, Vol. XII, p. 843.

ANIMAL CHEMISTRY is that department of chemistry which aims to accumulate knowledge of the chemical structure and properties of animal bodies. It aims to discover not only the exact composition of living protoplasm, but also the precise steps in its constructive and destructive changes, and the exact nature of the various secretions, excretions and other products of the living animal-cell.

The present knowledge of the exact chemical processes involved in the structure and functions of living matter is in a very crude condition. This is due to the fact that chemical treatment kills living organisms, and thus only the composition of dead matter can be determined by known methods of chemical investigation. It is impossible to determine the extent to which the syntheses and analyses of the living body resemble those of the chemist in the laboratory. Great progress, however, has been made in our knowledge of substances which enter largely into the composition of protoplasm and its products. See PHYSIOLOGICAL CHEMISTRY, in these Supplements.

ANIMALCULE, a term which, although etymologically applicable to any very small animal, is limited, in ordinary language, to those animals which are microscopical. It is popularly applied to the unicellular animals (*Protozoa*). All animalcules were at first supposed to belong to the same general type of structure, but are now known to be extremely varied; hence the term has become so vague in meaning that it is disused by scientific writers.

ANIMAL ELECTRICITY, a term applied to electricity generated in the bodies of animals, particularly in certain fishes. It has been shown to be identical with ordinary electricity. Some authors hold that electric currents are generated in all muscular and nervous tissues. Several animals have special electric organs which are capable of giving powerful shocks. These organs are apparently modified muscular tissue, and are intimately connected with the nervous system. In the African fish *malapterurus* the electric organs

lie just beneath the skin, and nearly surround the trunk. They give a discharge capable of killing small fishes kept in the same aquarium. The organs of the torpedo, or electric ray, lie on both sides of the head. In the electric eel (*Gymnotus*) the organs largely replace the ventro-lateral muscles of the tail.

ANIMAL HEAT. Physiologically considered, the animal body is a machine for converting the potential energy supplied by food into the actual energy of heat and mechanical work. Living protoplasm is constantly in process of disintegration and oxidation, and these changes are accompanied by evolution of heat. The greater the activity of change, the higher does the temperature tend to become. Not only, therefore, are the so-called cold-blooded animals really warmer than the surrounding atmosphere, but even plants recognizably evolve heat, and the temperature of certain flowers, where protoplasmic activity is highest, may sometimes almost reach that of the human body. Even the *Infusoria* evolve heat, as is shown by the slowness with which the surrounding water freezes. Cold-blooded and warm-blooded animals thoroughly agree in evolving considerable amounts of heat, the difference between them being that in the former the means of loss of heat by the skin, etc., are great as compared with the normal production of heat, while in the latter the loss and production of heat are kept balanced.

ANIMAL MAGNETISM. See MAGNETISM, Vol. XV, p. 277.

ANIMAL MECHANICS. See MECHANICS, Vol. XV, p. 772.

ANIMALS, CRUELTY TO. See CRUELTY TO ANIMALS, in these Supplements.

ANIMA MUNDI, according to many of the early philosophers, a force or vital principle, immaterial, yet not unintelligible; inseparable from matter, but giving it its form and movement; the source of all physical and sentient life. Plato believed it to be the intermediate agency between matter and pure spirit. In the system of the Stoics, it was conceived to be the sole vital force in the universe. The notion does not seem to have been entertained by the schoolmen, but it reappears in the writings of Cornelius Agrippa, Paracelsus and Van Helmont, and in a modified form was held by More and Cudworth. The doctrine of the immaterial *anima* in matter, but distinct from it, was upheld by Stahl in 1720; but his term *animism* has now been adopted, with a much wider signification, by Dr. Tylor and other anthropologists of the new school. See ANIMISM, Vol. II, p. 55.

ANION. See ANODE, in these Supplements.

ANISODACTYLS, a very artificial group of animals in the system of Cuvier. It was designed to include pachydermatous quadrupeds with unsymmetrical hoofs. As such it was almost synonymous with perissodactyls. Recent naturalists have dropped the term.

ANIUJ. The name of two rivers in northeastern Siberia. The Greater Aniuj has a course of 270 miles, and discharges itself into the Kolyma, near lat. 68° N. The Lesser Aniuj empties into the Kolyma near the same place, after a course of 250 miles.

ANKER, a Dutch liquid measure containing 10 wine-gallons.

ANKYLOSIS. See ANCHYLOSIS, Vol. II, p. 9.

ANNA, a town of Union County, southern Illinois, on the Illinois Central railroad, 35 miles N. of Cairo. It is the center of the southern Illinois fruit district. Population 1890, 2,295.

ANNA OR ANNE, SAINT, according to tradition the wife of St. Joachim, and mother of the Virgin Mary, the mother of Jesus. The first mention of her is by St. Epiphanius, in the fourth century, but toward the eighth century she was all but universally held in honor. She is the patron saint of carpenters. Her festival falls on the 26th of July; with the Greeks, on the 9th of December.

ANNABERG, a mining-town of Saxony, on the northern slope of the Erzgebirge, 34 miles S. of Chemnitz. It is situated at an altitude of 1,800 feet above tide-water, in the midst of a mining district. The hills around contain mines of silver, tin, cobalt and iron. It has extensive manufactures of lace, silk ribbons, corsets, and buttons, the second of these having been brought to Annaberg by the Belgian Protestant refugees in 1590. Its mining industry is now less remarkable than in the sixteenth century. Population 1895, 13,985.

ANNAM, a French protectorate, formerly a province of southeastern China, lying east of Siam and Burmah. A treaty was ratified at Hué, Feb. 23, 1886, by which the French assumed the administration of affairs, Prince Buoi Lan being proclaimed king, Jan. 31, 1889, under the title of Tham Thai, under the protection of the French. By the treaty the ports of Turane, Qui-Nhon, and Xuan Day were opened to European trade, the customs being conceded to France. French troops occupy part of the citadel of Hué, which has a population of 30,000. The internal affairs of the country are administered by native officials under the direct control of the French. The area of Annam proper is about 27,000 square miles, and of the territory more or less dependent upon it, about 19,300 square miles. The population is variously estimated at from 2,000,000 to 5,000,000, the latter figures being regarded as more nearly correct. The population in the towns and along the coast is Annamite, while the interior hilly portions consist of Möis tribes. There are 420,000 Roman Catholics. There are 600 French soldiers, and 3,000 native troops under the French. The country produces rice, maize, and other cereals; the areca-nut, mulberry, cinnamon, tobacco, sugar, betel, manioc, bamboo, timber, caoutchouc, dyes and medicinal plants. There are iron, copper and silver mines, and some auriferous strata. A French company has been formed for working the coal-mines at Turane. The imports amounted in 1894 to $936,736, and the exports to $613,221; the total coasting trade amounted to about

$4,224,588. The chief imports are cotton yarn, cottons, tea, petroleum, paper goods, etc.

ANNANDALE, a village of Dutchess County, New York, situated near the left bank of the Hudson River, 21 miles N. of Poughkeepsie. It is the seat of St. Stephen's College, a Protestant Episcopal institution founded in 1860. Here some 67 young men receive instruction from 7 professors. The college has productive funds amounting to $181,303. Population of the village in 1890, 119.

ANNANDALE, a part of Dumfriesshire, Scotland. See ANNAN, Vol. II, p. 61.

ANNANDALE, THOMAS, an English surgeon; born at Newcastle-upon-Tyne, England, Feb. 2, 1838, and educated at the Newcastle Infirmary and the University of Edinburgh. He became private assistant to the late Professor Syme, demonstrator of anatomy in the University of Edinburgh, and surgeon and lecturer on surgery to the Edinburgh Royal Infirmary. His high reputation as a practical and operating surgeon and teacher of surgery led to his appointment, in October, 1877, as regius professor of clinical surgery in the University of Edinburgh. He is the author of many medical works and numerous contributions to profession periodicals.

ANNA PERENNA, in mythology, the daughter of Belus and sister of Dido. After the death of the latter, she is said to have fled to Italy from Carthage, and to have been kindly received by Æneas. Here she is fabled to have excited the jealousy of Lavinia, and fled and threw herself in the river Nuncius. Thenceforth she was worshiped as the nymph of the river, under the name of Anna Perenna. Other authorities claim a higher antiquity for the goddess, as an old Italian divinity, and urge that her identification with the sister of Dido is a myth of late origin.

ANNA PETROVNA, Peter the Great's eldest daughter; born in 1706. She married Charles Frederick, duke of Holstein-Gottorp, in 1725. Her son became Peter III of Russia. She died in 1728.



STATE HOUSE, ANNAPOLIS, MARYLAND.

ANNAPOLIS, a city and port of entry, capital of the state of Maryland, and county seat of Anne Arundel County, situated on the Severn, near its entrance into Chesapeake Bay. The harbor, known as Annapolis Roads, is one of the best in the United States. Annapolis is the seat of the United States Naval Academy, of St. John's College, and of St. Mary's Seminary. Among the prominent buildings are the courthouse, jail, governor's mansion, and a massive brick statehouse, surmounted by a lofty dome and cupola. Population 1890, 7,604. See ANNAPOLIS, Vol. II, p. 61.

ANN ARBOR, a prosperous city and railroad center, county seat of Washtenaw County, Michigan, with a population in 1890 of 9,431,—an increase during the last decade of 1,370. See also ANN ARBOR, Vol. II, p. 61; also MICHIGAN UNIVERSITY, in these Supplements.

ANNASIR OR AL NASIR LEDINILLAH, an Abassid caliph who reigned in Bagdad, 1180–1225. He was a Mæcenas to the arts and learning, and a successful soldier in resisting invasion.

ANNATTO. See ARNOTTO, Vol. II, p. 627.

ANN, CAPE, a rocky peninsula, forming the eastern extremity of Essex County, Massachusetts, and the northern point of Massachusetts Bay. It is about 30 miles N.E. from Boston, and on the peninsula are the towns of Gloucester and Rockport, as well as numerous summer resorts. On Thatcher's Island, two miles off the eastern point of the Cape, are two fixed lights, about 1,800 feet apart.

ANNEKE, MATHILDA FRANCESKA GIESLER, a German-American woman's rights advocate; born near Blankenstein, Prussia, April 3, 1817. She was early an agitator for political and social freedom, serving as one of her husband's staff in the revolution of 1848. Seeking an asylum in America on the defeat of the revolutionists, she settled at Milwaukee, editing the *Frauen Zeitung* and conducting an educational institution for young women.

ANNE OF AUSTRIA, the daughter of Philip III, king of Spain, and wife of Louis XIII, king of France; born in Madrid, Spain, Sept. 22, 1601; she was married Nov. 9, 1615, becoming the mother of Louis XIV of France, and Philip, founder of the House of Orleans. On the death of her husband in 1643, she became regent of France, though the government was speedily placed in the hands of Mazarin. On this statesman's death in 1661, she retired to a convent, where she died, Jan. 20, 1666. Her regency was marked by the outbreak of the Fronde.

ANNE OF BRITTANY, queen of France; born at Nantes, 1476; daughter and heiress of Francis II, duke of Brittany; she married Charles VIII, king of France, in 1492, and after his death in 1499, she married his successor, King Louis XII. By her first marriage, Brittany, as her dowry, the last of the great fiefs of France, became united to the crown. She died Jan. 9, 1514, two years after her second widowhood.

ANNE OF DENMARK, daughter of Frederick II, king of Denmark, and husband of James VI of Scotland (afterward James I of England);

born at Skanderborg, Jutland, Dec. 12, 1574; married at Upslo, Norway, Nov. 23, 1589. She had Romanish tendencies, and was as much given to frivolity as her husband was given to pedantry. She died at Hampton Court Palace, March 2, 1612.

ANNENKOW OR ANNENKOFF, MICHAEL, a Russian general officer and engineer; son of a Russian general officer, he was born in St. Petersburg in 1838, and was from his earliest years destined for a military career. His first service was seen in the Polish insurrection. Having attained the rank of colonel, he followed the German army as a military attaché in the Franco-Prussian war. Then, with the intrepid Skobeleff, he took part in the Merv campaign. His greatest achievements, however, have been the construction of the Transcaspian and the Transsiberian railroads.

ANNI. See ANI, in these Supplements.

ANNIHILATIONISTS, a religious sect. See ESCHATOLOGY, Vol. VIII, p. 538.

ANNISTON, a busy manufacturing city and railroad center in Calhoun County, Alabama. It has 3 banks, 3 newspapers, 23 churches, and an excellent system of schools. There are iron-mines in the vicinity, and iron and cotton goods are the leading products. It is situated 57 miles E. by N. of Birmingham, and has stations on the Louisville and Nashville and Southern railroads. Population 1890, 9,998.

ANNIUS OF VITERBO, an Italian Dominican monk; born at Viterbo in 1432. He issued a treatise on the empire of the Turks in 1471, and in 1498 published a spurious collection of lost classics in 17 volumes. These have been proved to be forgeries. He died Nov. 13, 1502.

ANNO DOMINI means in the year of our Lord, and is abbreviated A.D. This abbreviation is frequently used in legal documents, followed by the words or figures expressing the year. The use of this term in expressing dates is not necessary to the validity of the document, except in indictments and those writings where the most extreme accuracy is required.

ANNOLIED, an ancient German poem, eulogistic of Anno, the tutelary saint of Cologne. Its date is ascribed to a period soon after 1073, when Anno died in the archiepiscopate of Cologne. Its literary value, from a linguistic point of view, is considerable. Various modern editions have appeared.

ANNUAL REGISTER, a yearly record of public events, commenced in 1759 and continued to the present time. It was projected by Robert Dodsley, the bookseller, and for nearly thirty years Edmund Burke wrote the survey of events. The work is now published by Messrs. Rivington. Preceding works of the same kind were Boyer's *Political State of Europe* (1711–39) and the *Historical Register*, a quarterly (1716–38). Sir Walter Scott was among the contributors to the *Edinburgh Annual Register* (1808–27). See BURKE, Vol. IV, p. 540.

ANNUITY TAX, a local impost for the payment of the salaries of the established clergy of the city of Edinburgh. It was first established on a limited scale in 1661, and was extended in 1809. It amounted at one time to 6 per cent on the rent of houses and shops within the royalty. The tax was reduced in 1860, and under an act passed in 1870 it was redeemed by $282,500, paid by the corporation to the Edinburgh ecclesiastical commissioners.

ANNULUS, in botany, a delicate ring, or ring-like membrane, found upon certain plants. In most ferns the spore-cases are surrounded by an elastic annulus; many mosses are supplied with an elastic ring or annulus extending about the orifice of the capsule, between the lid and the base of the peristome; and in fungi an expanded ring appears upon the stem of the *Agaricus* after the cap has expanded, being the torn remains of the velum.

ANNUNCIADA, the name given to several religious orders and societies. The principal of these are,—1. The Society of the Annunciada, founded in Rome, in 1460, by Cardinal John Turrecremata, for the marriage of poor young women. It now provides, every Lady Day, 60 Roman crowns, a dress of white serge, and a florin for slippers, to above 400 persons for marriage portions. 2. The military order of the Annunciada of Savoy, created in 1362, by Amadeus, count of Savoy. 3. A religious order for women, instituted at Bourges, in 1500, by Jeanne de Valois, daughter of Louis XI, in honor of the ten virtues ascribed to the Virgin Mary. The nuns of this order wear a gray gown, a scarlet scapular, a blue simar and a white mantle. 4. The Celestial Annunciades, a religious order for females, instituted in 1604, by Maria Vittoria Fornari. The nuns dress in a blue mantle, and are therefore called "The Blue Sisters."

ANNUS DELIBERANDI, in Scots law, the period of a year allowed to an heir to decide whether he would accept the inheritance with the burden of his predecessor's debts. By recent legislation the period has been shortened to six months.

ANNVILLE, a city of southeastern Pennsylvania, five miles W. of Lebanon, on the Allentown and Harrisburg branch of the Philadelphia and Reading railroad. It is the seat of Lebanon Valley College, founded by the United Brethren in 1866. Population 1890, 1,283.

ANOA, a group of ruminating quadrupeds of the bovine type, found in Celebes. Many of them resemble antelopes, and were formerly so classed. One species resembles a small buffalo. The natives call them sapi-outan or "cow of the woods."

ANODE, meaning the way up, a term in electrolysis, introduced by Faraday to designate the positive pole, or that surface by which the galvanic current enters the body undergoing decomposition (electrolyte); as opposed to cathode, the negative pole. In electrolytic decomposition, those ions of a compound which move against the current of electricity and gather or are decomposed

at the anode are called anions. See ELECTROLYSIS, Vol. VIII, p. 106.

ANOKA, a city of southeastern Minnesota, county seat of Anoka County, 20 miles N.W. of St. Paul, on the Great Northern and Northern Pacific railways. It is on the left bank of the Mississippi, at the mouth of Rum River, which affords excellent water-power for manufacturing purposes. An iron bridge 900 feet in length here spans the "Father of Waters." The town is the center of an extensive trade, and has a high school and business college. Population 1895, 3,812.

ANOLIS, a genus of lizards of the family *Iguanidæ*. One peculiarity is their ability to greatly inflate the skin of the throat. They possess brilliant colors, which they have the power of changing. They are often wrongly called chameleons. Several species are common in the southern United States.

ANOMALISTIC YEAR, the interval that elapses between two successive passages of the earth through its perihelion, or point of nearest approach to the sun. It consists of 365 days, 6 hours, 13 minutes, 45 seconds, and is 25 minutes less than a mean tropical year.

ANOMALY, the angle measured at the sun between a planet in any point of its orbit and the last perihelion. It is so called because the first irregularities of planetary motion were discovered in the discrepancy between the actual and computed distance. The anomaly was formerly measured from the aphelion, the opposite point of the ellipse; but from the fact that the aphelia of most of the comets lie beyond the range of observation, the perihelion is now taken as the point of departure for all planetary bodies.

ANOMIA, a genus of lamellibranch, or bivalve mollusks. There are a numerous, widely distributed species, both living and fossil.

ANONACEÆ, the custard-apple family, are polypetalous dicotyledons, closely allied to *Magnoliaceæ*. They are trees and shrubs, mostly tropical, and usually aromatic and fragrant. The fruit is sometimes dry, and in this case is usually aromatic and pungent. More frequently, however, the fruit is succulent, and is then often delicious. Almost the single representative in the United States is *Asimina triloba*, the common pa-paw.

ANONYMOUS, a term applied to a book when the author does not give his name; when an assumed name is given, the term *pseudonymous* is used. Works of this class constitute one of the great difficulties of bibliography. Formerly, political articles were nearly always anonymous, as also was most of the literary criticism. It is generally admitted that anonymity secures the independence of the critic; but it is true that he frequently abuses his advantage.

ANOPLOTHERIUM. See *Selenodonta*, under MAMMALIA, Vol. XV, p. 430.

ANSARS, ANSARIANS, NOSAIRIANS OR NUSAIRIEH, a sect living in the Nusairieh Mountains, between Lebanon and Antioch. They are probably descendants of the original population, but adopted many tenets of the Shiah or Persian section of Islam. They have wrongly been confounded at times with the remnants of the Assassins, but are really hostile to them. They appear in the coast towns, keep their doctrinal views much to themselves, recognize a succession of Messiahs from Abraham to Christ, look for a coming triumphing Mahdi, accept some Christian observances, hold that the real Mahomet of the Koran was of their race, worship the sun, and believe in a human transmigration of souls for apostates from their faith. They are supposed to number about 75,000 souls.

ANSCHARIUS OR ANSKAR. See ANSGAR, in these Supplements.

ANSCHÜTZ, KARL, a German musician and conductor of opera; born at Coblentz, Germany, in February, 1813. Of a musical family, he married the daughter of his teacher, Friederich Schneider. Anschütz's success was marked and rapid. He was conductor of the Royal Musical Institution at Coblentz, and of the theater there, under title of royal musical director. Resigning in 1848, he went to Nuremberg, to Amsterdam and London, wielding the baton with success at concerts and operas. He came to America in 1857, conducted Italian opera for three years, and in 1862 introduced German opera in New York City. He took a lifelong interest in his art, formed many singing societies, and died in New York, Dec. 29, 1879.

ANSDELL, RICHARD, a noted animal and landscape painter; born at Liverpool in 1815; died April 20, 1885. Abandoning business for art, he exhibited at the Royal Academy in 1840, and at the British Institute in 1846. He thrice won the Heywood medal at Manchester, and a gold medal at the Paris exhibition of 1855.

ANSERES, an order composed of the geese and ducks. The order is equivalent to the *Lamellirostres* of Cuvier.

ANSGAR, the Apostle of the North, was born in Picardy in 801, died at Bremen in 865. Under the patronage of Louis le Débonnaire, he went with his colleague Antbert to preach Christianity to the heathen Northmen of Schleswig. He suffered many persecutions, but had nevertheless such success that in 831 the pope established an archbishopric in Hamburg (transferred to Bremen in 847), and Ansgar was appointed the first archbishop. He made several missionary tours.

ANSON, capital of Jones County, in central Texas, is situated 20 miles N.W. of Abilene station, on the Texas and Southern Pacific railroad. Population 1890, 495.

ANSONIA, a town of New Haven County, southwestern Connecticut, on the banks of the Naugatuck River. It has manufactories of iron, brass and copper goods, clocks, electrical goods, webbing and knit goods, carriages and hardware. Situated on the New York, New Haven and Hartford railroad, 12 miles W.N.W. of New Haven. Population 1890, 10,342.

ANSONIANS. Same as ANSARS, in these Supplements.

ANSORGE, CHARLES, a German patriot and

American musician; born at Spiller, in Silesia, in 1817; educated at Breslau; he became a teacher and an editor; banished by the Prussian authorities for his advanced liberal writings, he came to America, settling at Boston, Massachusetts; was for several years organist and choirmaster of the First Church, in Dorchester; the West attracting him, he removed to Chicago in 1863. He died in Chicago, Oct. 28, 1866.

ANSORGE, CONRAD, a Russian pianist; born in Bachwald, Russian Siberia, October 15, 1862; studied there and at the Leipsig Conservatory. He performed in piano recitals at Berlin in 1886 and the succeeding year with marked success. Encouraged thereby, he appeared the following year in New York, and has since performed in most of the principal cities of the Union. His pianoforte compositions are numerous and valuable.

ANSPACH, ELIZABETH BERKELEY, MARGRAVINE OF, a versatile Englishwoman, daughter of Augustus, Earl of Berkeley; born in 1750. In 1767 she married the future Earl of Craven, and separated from him in 1780. Her husband died in September, 1791, and within a month she married the Margrave of Anspach. She had some abilities as a playwright and actress and the *cacoethes scribendi* sufficient to produce autobiographic memoirs. She died in Naples, Jan. 13, 1828.

ANSTED, DAVID THOMAS, geologist; born in London, Feb. 5, 1814; died May 20, 1880. After gaining a fellowship at Jesus College, Cambridge, he devoted himself to geology under Sedgwick, and in 1840 was appointed to the chair of geology in King's College, London. In 1845 he became attached to the Indian Military School at Addiscombe, and the College for Civil Engineers at Putney. From this time until his death he devoted his studies to the economic application of geology, and was much consulted in great mining and engineering operations. His works on his chosen subject were numerous and popular.

ANSTER, JOHN, an English author, the friend of Coleridge; born near Cork, Ireland, in 1798. He was appointed, after graduation, regius professor of civil law in the University of Dublin. Some contributions to *Blackwood's Magazine*, a translation of *Faust*, and a volume of poetical translations from the German were his principal works. He died in Dublin, June 9, 1867.

ANSTEY, F., pseudonym for Thomas Anstey Guthrie; q.v., in these Supplements.

ANSWER, in judicial proceedings, is the formal written statement made by a defendant in a suit in chancery or admiralty in which he sets forth particularly his defense to the charges made against him in the bill or petition in chancery or libel in admiralty. In other legal proceedings such statements of defense are termed pleas, except in states where codes have been adopted, in most of which states the term *plea* is practically obsolete, and the term *answer* is applied to the defense made in all classes of legal proceedings. In chancery cases, if discovery is sought by the bill, the answer contains the disclosure asked for, as well as the defense claimed by the defendant. An answer in chancery must be signed by counsel, and must be sworn to if made by an individual, and also under the corporate seal if by a corporation. But in most states the complainant may, by express direction made in the bill itself, waive the oath. If the oath be not waived, a sworn answer is taken as true unless it be overcome by the testimony of at least two witnesses, or the equivalent. When the oath is waived, the answer has no effect as evidence, whether sworn to or not. An answer must be full and complete, and must meet every material allegation made in the bill. It must be direct, and without scandal or impertinence. A defendant may demur to a bill instead of answering it, thus calling in question the sufficiency of the bill taken, for the sake of argument, as true. An answer in chancery is not demurrable. The term answer is also applied in many proceedings, collateral or incidental to the main suit, as the answer of a garnishee or of a party charged with obstructing the possession of a receiver or charged with contempt of court.

ANTACIDS are, in Garrod's classification, drugs used for the purpose of neutralizing or diminishing excessive acidity of stomach or kidney secretions. They are also called alkaline remedies. Thus the use of magnesia to cure heartburn, or of lithiawater to correct an excess of uric acid in a rheumatic or gouty diathesis, are examples. Substances whose action is in the alimentary canal are termed direct antacids, and those that act upon the blood are called remote antacids. Many drugs act in both ways.

ANTAGONISM OF DRUGS, in the practice of medicine, is that quality which a drug has to counteract the effects of another in a physiological rather than in a chemical way. It is a form of antidotal medicine. For example, when fumes of ammonia are administered to overcome the effects of prussic (hydrocyanic) acid poisoning, the opposition of the drugs is chemical, and results in the formation of an innocuous nitrate, but the use of atropin to stimulate the action of the heart when it is depressed by this acid is dependent upon physiological processes. Generally, alkaline drugs are antidotal to acid poisons, and the converse is true. On a like principle, chlorin is recommended to overcome the effects of sulphureted hydrogen gas. In the same way calcium carbonates are given to overcome the action of oxalic and carbolic acids. In a like way the uses of oily or fatty remedies to neutralize irritant or corrosive poisons by forming harmless emulsions is antidotal and chemical. Chemical antidotes depend for their effectiveness on prompt administration, so that the noxious drug may be reached in the alimentary canal, where chemical reactions may go on before physiological effects begin. The antagonism of drugs begins after physiological response has set in. Familiar examples of antagonism are the counteractions of belladonna and opium, strychnia and chloral, bromal and atropin, digitalis and aconite. No examples are known of two drugs that are perfectly antago-

nistic, and the whole subject is empirical and obscure. It is thought that in the recent advances of isopathy, or the branch of medicine that deals with the therapeutics of attenuations of infection virus, this study may reach scientific precision and importance. It is suggested by the alleged experience that inoculations of erysipelas bacilli are antagonistic to diphtheretic virus, and a field of new research is here opened.

ANTANACLASIS, in rhetoric, that figure of speech in which a word is repeated, either in a different sense or with another inflection, by way of a kind of antithetical emphasis; also, the repetition, as a reminder, of a word or phrase after a long parenthetical sentence.

ANTANANARIVO, the capital of Madagascar, now a French possession. See MADAGASCAR, Vol. XV, p. 175.

ANTARCTIC EXPLORATION. See POLAR EXPLORATIONS, in these Supplements.

ANTARES, a very conspicuous double star in the constellation Scorpio, of great importance to mariners in the computation of longitude, and so named from its apparent resemblance to Ares, or Mars.

ANT-BIRDS, a name popularly used to designate any bird which feeds on ants, but more properly restricted to South American birds of the family *Formicariidæ*, remotely related to the fly-catchers.

ANTECEDENT, a term in logic, grammar and mathematics. In logic, it is a statement or proposition from which another is logically deduced. In grammar, it is the substantive (word or clause) to which a relative refers. In mathematics, we speak of the antecedent of a ratio,—that is, the first of two terms which compose the ratio; the first and third in a series of four proportionals.

ANTEDILUVIAN, anything that existed before the supposed Noachian flood. The word is often employed in modern usage, in a somewhat disparaging sense, for anything antiquated or primitive.

ANTELOPE, AMERICAN, PRONGBUCK OR PRONGHORN. See ANTELOPE, Vol. II, p. 102.

ANTENNÆ, the long whip-like appendages, popularly known as feelers, on the heads of crustaceans, insects, and other arthropods. There are two pairs in crustaceans, the anterior smaller ones being known as antennules. Insects and myriopods have only one pair. The antennæ are primarily organs of touch, but many are apparently visual and olfactory in function.

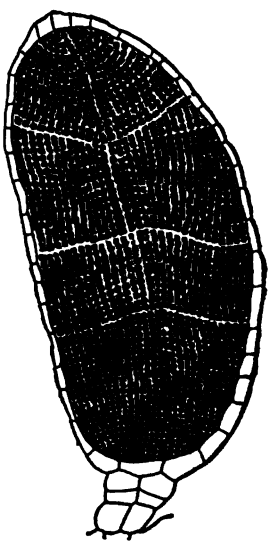
ANTENNARIUS, a genus of fishes found among corals in warm seas. They have curious shapes and strange colorings. The colors resemble those of seaweeds, rocks, and other surrounding objects.

ANTEROS, in Greek mythology, was the name given by some to a deity that opposed Eros, or Cupid; more commonly he was an avenging deity who punished those who failed to return the love of others. Pliny gives the name to a kind of amethyst.

ANTHELIA, luminous rings visible on a cloud or fog which lies opposite the sun. They occur chiefly in Alpine regions and in the polar seas, and are only seen when sunshine and cloud, or fog, occur at the same time. When, from an elevated position, as the mast of a ship or the ridge of a hill, the shadow of an observer is projected by the sun on a cloud or fog, he sees the head encircled by a luminous ring, and when the sun shines brightly, and the fog is dense, as many as four concentric rings of this nature are seen by the observer round the shadow of his head, having their common center in the point where a line from the sun through the eye of the observer meets the fog. It is also called the Circle of Ulloa, or the White Rainbow.

ANTHELMINTIC, expelling, or medicine tending to expel, intestinal worms. The chief intestinal worms found in the human body are the long threadworm (*Trichocephalus dispar*), in the upper part of the large intestines; the common tapeworm (*Tænia solium*), the broad tapeworm (*Bothriocephalus latus*), and the large roundworm (*Ascaris lumbricoides*), in the small intestines; and the maw, or threadworm (*Oxyuris* or *Ascaris vermicularis*), in the rectum. Of these the most frequent are the common tapeworm, the large roundworm, and the maw, or threadworm. Garrod makes anthelmintics, defined as substances which have the power of destroying the life of entozoa in the alimentary canal, the fourth order of his class IV, sub-class I, and subdivides it into direct anthelmintics, or vermicides; indirect anthelmintics, or vermifuges; and worm-preventives. Among direct anthelmintics may be enumerated: oil of male-fern, oil of turpentine, cusso, kamila, and bark of pomegranate root; of vermifuges: calomel, scammony, jalap, gamboge, and castor-oil; and of worm-preventives: sulphate of iron, or other ferruginous salts, quassia, and nux vomica.

ANTHER, that specialized part of the stamen which develops the sacs (sporangia) containing the pollen-grains. Morphologically, the stamen is a microsporophyll, the anther representing a cluster of *microsporangia* (usually four in number), or a *sorus*.



ANTHERIDIUM OF MARCHANTIA POLYMORPHA (ORIGINAL).

ANTHERIDIUM, the generic name of the male reproductive organ in plants. It is usually applied only in cryptogams, as its homologue among phanerogams is somewhat obscure. It is in no sense the morphological equivalent of the "anther," from which its name was derived. In thallophytes it is commonly a single mother-cell, developing spermatozoids, which escape by

the rupturing of the walls. In bryophytes and pteridophytes it is a multicellular sac projecting above the surface, or more or less imbedded in the tissues, which ruptures or opens at maturity for the discharge of spermatozoids. In thallophytes its companion organ is usually styled the oögonium; in bryophytes and pteridophytes, its companion organ is the archegonium. The spermatozoid is enabled, by means of the lashing movement of its cilia, to reach and fertilize the female cell (oösphere). See also MORPHOLOGY, in these Supplements.

ANTHINÆ, a subfamily of oscine passerine birds, belonging to the family of wagtails (*Motacillidæ*). They are small birds, found widely distributed over the world. The pipits or titlarks are familiar representatives.

ANTHODIUM, the head or compound flower of the thistle and other *Compositæ*, in which a number of flowers unite in a head surrounded by a common involucre.

ANTHONY, a town of southern central Kansas; capital of Harper County; situated 18 miles from the Oklahoma boundary line and 52 miles S.W. of Wichita. The town is a railroad center, being traversed by the Missouri Pacific, St. Louis and San Francisco, and Hutchinson and Southern railroads. It is in the midst of an agricultural and stock-raising district. Population 1895, 1,942.

ANTHONY, HENRY BOWEN, an American statesman; born in Coventry, Rhode Island, April 1, 1815; died in Providence, Sept. 2, 1884. He graduated at Brown University in 1833, and took up journalism, being very successful in this adventure. He was twice elected governor of Rhode Island (1849 and 1850), and declined a third election. In 1859 he was elected, as a Republican, to the United States Senate, where he remained by re-election till his death, and was three times elected president of the Senate,—in 1863, 1871 and 1884. He served on numerous important committees, and was very popular in Washington.



H. B. ANTHONY.

ANTHONY, JOHN GOULD, an American naturalist; born in Providence, Rhode Island, May 17, 1804; died in Cambridge, Massachusetts, Oct. 6, 1877. He went into business in Cincinnati, and was engaged there in commercial occupations for 35 years. Meanwhile his interest in natural history had developed, and in 1863 he took charge of the conchological department of the Museum of Comparative Zoölogy. Mr. Anthony wrote numerous papers on shell-fish, and was recognized as an authority on American land and fresh-water mollusca.

ANTHONY, SUSAN BROWNELL, reformer; born in South Adams, Massachusetts, Feb. 15, 1820. She was educated at a Friends' boarding-school in Philadelphia, and then taught in New York state for 15 years. Miss Anthony first commenced her public career in 1847, when she began lecturing on temperance. In 1851 she called a temperance convention of women in Albany, and the following year the Woman's New York State Temperance Society was organized. In 1857 she became prominent as an agitator for the abolition of slavery, and also, with others, in securing the passage of the act of the New York legislature of 1860 giving to married women the possession of their earnings and the guardianship of their children. She was instrumental in obtaining for women the right to speak, vote and serve on committees in educational and other conventions, and her energies have always been directed to secure equal civil rights for women. Since 1855 she has addressed annual appeals and petitions to the legislature, pleading for the cause of female suffrage, and in 1867 she went to Kansas with Elizabeth Cady Stanton and Lucy Stone, and obtained about 9,000 votes in favor of woman suffrage. In 1872 Miss Anthony cast ballots at the state and Congressional election, in order to test the application of the fourteenth and fifteenth amendments of the United States constitution. She was indicted and fined one hundred dollars for illegal voting, but she declared that she would never pay the penalty, and it has never been collected. She wrote, in conjunction with Elizabeth Cady Stanton and Matilda Joslyn Gage, *The History of Woman Suffrage*, and in 1892 was appointed by Governor Flower to a position in the State Industrial School at Rochester, New York.



SUSAN B. ANTHONY.

ANTHONY, WILLIAM ARNOLD, an American physicist, born in Coventry, Rhode Island, Nov. 17, 1835. He graduated at Sheffield Scientific School in 1860, and the same year began teaching, and occupied positions in various institutions of learning until 1872, when he accepted a professorship at Cornell University. He has constructed two turbines, one of which gave an efficiency of 81 per cent, a gram dynamo-electric machine for 25 amperes and 250 volts, and a tangent galvanometer which measured accurately currents from 1-10 to 250 amperes. Professor Anthony is a member of several scientific societies, and has contributed numerous articles to different magazines and reviews.

ANTHONY OF PADUA. See ANTONY, in these Supplements.

ANTHONY'S NOSE, the name of two bold promontories in the state of New York: the extremity of the Klips, or "Cliff," a mountain on the north bank of the Mohawk, and a projection, 1,230 feet in height, from Breakneck Hill, at the

entrance to the Highlands, on the east bank of the Hudson, 57 miles from New York City.

ANTHOPHYTES, a name formerly applied to the highest group of plants, and again coming into use, literally signifying "flowering plants." In more common use is the word *phanerogams;* and coming into large use is the word *spermaphytes* (better *spermatophytes*), signifying "seed-plants."

ANTHOSIDERITE, a hydrated silicate of iron found in Brazil, having a fibrous radiated structure.

ANTHOXANTHUM, a genus of grasses producing dull yellow flowers, and including the fragrant sweet vernal grass (*A. odoratum*) of the meadows of Europe, which has been naturalized in America.

ANTHOZOA, one of the three classes of cœlenterates, including sea-anemones, dead men's fingers, corals, etc. They are the same as the *Actinozoa* without the *Ctenophora*. See ACTINOZOA, Vol. I, pp. 129–131.

ANTHRACENE, a compound of carbon and hydrogen obtained in the distillation of coal-tar. Although long known to chemists, it is as the source of artificial alizarin that it has become of commercial value.

ANTHRACITE. See ANTHRACITE, Vol. II, p. 106, and COAL, in these Supplements.

ANTHRAPURPURIN, a substance having the same composition as purpurin, which is formed in making artificial alizarin. It has an orange color and can be used as a dye.

ANTHRAX. See MURRAIN, Vol. XVII, p. 58; WOOLSORTER'S DISEASE, Vol. XXIV, p. 663.

ANTHRENOUS, a genus of insects belonging to the beetles (*Coleoptera*). Many of them are museum-pests, destroying the natural-history specimens. *A. scrophularia* is the common carpet-beetle, which is so destructive to carpets.

ANTHROPOLATRY, the worship of man; the giving of divine honors to a human being; a term always employed in reproach. The term is chiefly known in ecclesiastical history in connection with the employment of it by the Apollinarians against the orthodox Christians of the fourth and fifth centuries, with reference to the doctrine of the perfect human nature of Christ.

ANTHROPOLOGY, CRIMINAL. Until recent years all criminals were treated on one of two theories—one theological and the other civic. The first position was that sin carried with it a moral culpability, or a depravity that constituted guilt, as in the case of original sin and the just damnation of the inheritor. If crime was to be looked upon as a simple degradation of morals, wrought by inexcusable perversity, all that could be required of penalties was that in some rude way they should express the social sense of its atrocity. The second theory cared naught for the convicted, as to their personality or capacity for reformation. They were to be used as examples to deter others from following in their footsteps. In neither of these cases was the subject of condemnation particularly considered, and only to a slight extent the extenuations of his crime. As a result, penalties were arbitrary, capricious, and without any systematic basis. Moreover, the jurisprudence of different states differed greatly, and, as Montaigne expressed it, "what was right on one side of the Pyrenees was wrong on the other." In either case a criminal was an outlaw and the foe of conventional society, who might be used in any way to serve the current notions of what was best for the community.

From the time of John Howard and Elizabeth Fry a new sentiment of pity began to spread, and an increasing number of persons studied questions of penology or supported efforts to ameliorate the inhumanities or stupidities of prison life. The first form this interest took was the reformation of convicts. It was the inevitable result of personal study of the individuality of felons. Various devices were fabricated to convert the criminal into a conventional world. The solitary system of prisons was adopted, through Quaker influence, at the Cherry Hill prison at Philadelphia; the Crofton or Irish system was invented and long applauded; the Elmira penitentiary system of New York, under Zenas Brockway, was tried in New York. Quite as influential in suggestion was the British idea of transporting its convicts, as a genital or unimprovable class, to Australasia, and thus ridding the United Kingdom of its morally abnormal constituents and leaving a guileless citizenship behind. These experiments have had various results, and none of them as yet are quite satisfactory.

From the data accumulated, it inevitably followed that a class of investigators would spring up who should study the question as one of a typical and differentiated class. This gave rise to what is now termed "Criminal Anthropology." The term seems chiefly to mean the science or art of analyzing felons as a typical or special class of humanity, and, like all such specializations, has its merits and defects as a solution of a social problem. Probably the most eminent, as he is the best-known founder, of this school is Cesar Lombroso, who studied the question from a physiological and genetic point of view. His studies go upon the theory that criminality proceeds from congenital causes, from excessive passion, from habit and from insanity. Although the question of moral insanity has come again and again in an expert way into the courts, there is a weighty class who refuse to recognize it, except as a passionate paroxysm of a weak nature transported by jealousy or revenge. This sort of plea in court is liable to great abuse when skillful attorneys play upon the passions of a jury, or public sympathy runs with the indicted. It is a dangerous element in jurisprudence, as its limitations are indefinite.

Upon the basis of specific criminal types grew up the criminal anthropometry of Alphonse Bertillon, a chief officer in the police prefecture of Paris. It is largely used in France, Belgium, Netherlands, England and some American cities, and its official adoption dates from 1882. Its

fundamental theory is that habitual criminality produces anatomical physical marks, not alone of physiognomy, but upon the body. Its use is chiefly detective; for measurements of all parts of the body, of especial organs, as the ears, nose and openings of the eye, epithelial creases on the thumb or fingers, and like means of identification, are conclusive. It is virtually a system of recording that overthrows all devices to escape identification. As a solution of criminal anthropology, it offers little of value.

No doubt can arise that criminals are more often the product of physiological conditions than of voluntary depravity or of a moral declension. Men do lapse, and repeated acts do result in loss of moral strength or degeneration; but moral declension gives but a small increment to the criminal classes. The study of criminal anthropology, regarding felons as the results of environment or heredity, must contribute much to the problem of the extirpation of a felonious class. As yet the study is in its infancy. See PRISON DISCIPLINE, Vol. XIX, pp. 747 et seq.

D. O. K.

ANTHROPOMETRY, the measurement of the human body to discover its exact dimensions and the proportions of its parts, for comparison with its dimensions at different periods, or in different races or classes. Cranial measurements have long been adopted by anthropologists as the basis of their classifications of races; but the conformation of the skull and the relation of its height to its breadth vary so much within the same tribe as not to be of themselves sufficient data on which to rest generalizations. As a basis of comparison, M. Quételet's method is infinitely more valuable. He defined the general types of mankind by measuring, with reference to such particular qualities as height, weight, complexion and the like, a certain number of men, and selecting as the standard the most numerous group, on both sides of which the groups decrease in number as they vary in type, and thus arrived at the typical *mean* man of a population.

ANTHROPOMORPHITE, one who attributes human form to the Deity. See AUDÆUS, Vol. III, p. 69; also ANTHROPOMORPHISM, Vol. II, p. 123.

ANTI-BURGHER. See UNITED PRESBYTERIAN CHURCH, Vol. XXIII, p. 728.

ANTICHLOR, the name formerly applied to commercial sulphite of soda by paper-makers, but now usually restricted by hyposulphite of soda.

ANTICLEIA, in mythology, the daughter of Antolycus and wife of Laërtes. She was the mother of Ulysses, or Odysseus, and is fabled to have died from grief at her son's long absence. Euripides (Iphigenia in Aulis, 524) styles Odysseus, a son of Sisyphus, in reference to a tradition as to Anticleia's intimacy with Sisyphus before she married Laërtes.

ANTICLINE, in geology. See *Anticlinical Folds* under GEOLOGY, Vol. X, pp. 300 301, 304.

ANTI-CORN LAW LEAGUE. See COBDEN, Vol. VI, p. 86.

ANTICYCLONE. See METEOROLOGY, Vol. XVI, p. 154.

ANTIDOTES. In a general sense, the term may be applied to whatever counteracts injurious influences, whether physical or mental. In medicine, an antidote is a substance employed to overcome the effects of some poison upon the animal system. See POISONS, Vol. XIX, p. 275.

ANTIETAM, BATTLE OF. This battle was fought on the banks of the Antietam River, which rises in Pennsylvania, and, flowing into Maryland, joins the Potomac about 50 miles from Washington. It took place between the Federals under McClellan, and the Confederates under Lee, on Sept. 16–17, 1862. At the close of the Pennsylvania campaign, the army of the Potomac was consolidated with the army of Virginia, and General John Pope was made commander-in-chief. McClellan had been removed, and the succeeding campaigns of that summer in Virginia terminated with the defeat of Pope at the second battle of Bull Run. This event was followed by Pope's resignation; McClellan was recalled, and on Sept. 5, 1862, Lee's army crossed the Potomac River, in pursuance of the plan of its commander, "to transfer the scene of operations to the enemy's territory." The campaign in Maryland was inaugurated at Frederick, and included among its leading features the surrender of Harper's Ferry with a force of 12,500 men.

McClellan, who had meanwhile been moving in pursuit of the enemy, came up with D. H. Hill's division at Boonsboro Pass, September 14th. An engagement followed, but without material advantage to either side. That same night Lee reached Sharpsburg, and two days later the opposing armies confronted each other on opposite banks of Antietam Creek, a stream of minor importance flowing through a beautiful expanse of country, and emptying into the Potomac River six miles from Harper's Ferry. The creek opposite Sharpsburg is fordable, and at the date of the battle was crossed by three stone bridges. On the night of September 16th the contending forces were placed in position, the right of the Union army being held by the divisions of Hooker and Mansfield, supported by the divisions of Sumner and Franklin, with Burnside on the left, and Fitz-John Porter's command occupying the center. The Confederate army was commanded by General Lee in person, the right, center and left being severally held by the divisions of Longstreet, D. H. Hill and Hood. They were arranged in order of battle on Antietam Heights, elevations ascending almost abruptly from Antietam Creek, between the latter and the Potomac River, and affording advantages of no inconsiderable importance. The battle was commenced at daylight on the morning of September 17th, Hooker and Mansfield attacking Hood's division, and compelling the latter's temporary retirement. The enemy was reinforced, however, and in time caused the retreat of Hooker, the battle so continuing with varying fortune throughout the day, the left doing comparatively little execution, the dislodgment of the Confed-

erates from their position being found to be impossible, although Porter's fine command of 20,000 men, including a division of regulars, had not been engaged at all, being held in reserve. The Union lines were impregnable; all attempts to divide the army were vain, the Confederates, each time the attempt was made, being repulsed with disastrous results. The contest was prolonged until late in the afternoon, when a suspension of hostilities occurred, each army undertaking preparations for active operations on the succeeding day. The battle, however, was not resumed on the 18th, and that night Lee withdrew, recrossing the Potomac on the 19th, and marched to Winchester unmolested, taking with him his large baggage train and everything of value. McClellan, whose forces numbered nearly double those of Lee, was urged by President Lincoln in person to press the pursuit of the enemy, but 18 days later he was still on the north bank of the Potomac. This dilatory action resulted in his relief from his command and the end of his military career.

The battle of Antietam, or Sharpsburg as it is called by the Confederates, has been variously regarded, as indecisive, and as a decided success for the Union army. Both sides lost heavily, the Union loss being 2,108 killed, including General Mansfield, 10,302 wounded and missing; and the Confederate loss, 1,253 dead, 10,180 wounded and missing. Many of the Union officers were seriously wounded, General Joe Hooker among the number.

ANTIFEBRIN OR ACETANILID ($C^6H^5NH.C^2H^3O$), a white, colorless powder, with burning taste. It is almost insoluble in cold water, though readily soluble in alcohol. It is derived from anilin, to which it is closely allied. It was introduced in 1886 as a febrifuge, and its cheapness, its rapidity of action and its non-poisonous nature have brought it rapidly into favor as a substitute for quinine.

ANTI-FEDERAL PARTY. In 1787, when the convention called for the formulation of the constitution, and composed of delegates from the several states, had unanimously agreed upon the form, and had sent attested copies to the state legislatures for their consideration and approval, an earnest discussion arose among the people in all directions as to its merits. Its friends deemed it important to prepare and circulate the strongest possible popular arguments in its behalf. A series of 82 able papers were prepared, chiefly by Alexander Hamilton, of New York, and sent out under the name of "The Federalist," strongly supporting the proposed constitution. Immediately those who favored the "Federalist" began to be called Federalists and their opponents Anti-Federalists. Prominent leaders of the former were Washington, Hamilton, Jay and Madison, while Thomas Jefferson was early recognized as the leader of the latter. Jefferson sought to attach the name *Republicans* or *Democratic-Republicans* to the opposition, but with only partial success at that time. This party was the lineal ancestor of that known since the Presidency of John Quincy Adams simply as Democrats. See FEDERALISTS and DEMOCRATIC PARTY, in these Supplements.

ANTIGO, capital of Langlade County, in the south-central part of Wisconsin, 77 miles W. of Marinette and Menominee. The city was founded in 1880. It has several saw, planing and flour mills and has manufactories of chairs, veneers, excelsior, broom-handles, etc. Population 1895, 5,895.

ANTIGORITE. See MINERALOGY, Vol. XVI, p. 102.

ANTILOCAPRA. See ANTELOPE, Vol. II, p. 102.

ANTI-MASONIC PARTY. In 1826 William Morgan, who was preparing a revelation of the secrets of Freemasonry, suddenly disappeared. It was rumored that he had been foully dealt with by members of the order, and intense excitement was the result, followed by the establishment of a political party based on opposition to the order. It cast in New York, in 1828, 30,000 votes; in 1829, 70,000, and about 128,000 in 1832. In 1832 it nominated William Wirt for President, but only carried one state—Vermont. In 1835 it elected Joseph Ritner governor of Pennsylvania. The excitement gradually died out and the party disappeared. William H. Seward owed his start in political life to this party, which sent him to the New York senate in 1830.

ANTI-MISSION BAPTISTS, or as they call themselves, OLD-SCHOOL BAPTISTS, a sect of hyper-Calvinistic Baptists of America, who contemn Sunday schools, missions, colleges or theological schools as rendering the salvation of men dependent on human effort, and not upon Divine grace.

ANTIMONIAL WINE, in medicine, a solution of tartar emetic in sherry or other wine.

ANTIOCH BAY, an indentation of the shores of the Mediterranean at the estuary of the Orontes River, extending from latitude 35° 50′ to 36° 20′ N., longitude 36° E. It is sheltered by lofty mountains on the north and south, is of considerable depth, and affords good holding-ground for anchors. Ruins on the north shore are said to be those of an ancient port of Antioch, called Seleucia Peiria.

ANTIOCH COLLEGE, an institution of learning at Yellow Springs, Greene County, Ohio, founded in 1852. It is non-sectarian and co-educates the sexes. Twelve instructors, under the presidency of D. A. Long, attend to the requirements of 200 students. The college has funds amounting to $100,000, an annual income of $6,000 and a library of 7,000 books.

ANTIOCHIAN SCHOOL, a theological school of the fourth century, whose tenets were opposed to the Alexandrian school. See THEODORE OF MOPSUESTRA, Vol. XXIII, p. 255; LUCIAN, Vol. XV, p. 46; PAUL OF SAMOSATA, Vol. XVIII, p. 429.

ANTIOCHUS IX, surnamed CYZICENUS, a king of Syria for the brief period of one year, 96–95 B.C. He was the son of Antiochus VII by Cleopatra. He committed suicide, 95 B.C.

ANTIOCHUS X, surnamed EUSEBES, a king

of Syria, son of Antiochus IX, and a ruler for as brief and inglorious a period. Succeeding to the throne on his father's suicide in 95 B.C., he was soon deposed by his subjects, driven into exile and died in obscurity.

ANTIOCHUS XIII, styled ASIATICUS, the last king of the Seleucidæan dynasty of Syria. Ascending the throne about 69 B.C., he fell a captive in the hands of Pompey, when the Roman legions overran Syria in 65 B.C. His country became a Roman province, and he figured as the *spolia opima* in a Roman conqueror's triumphal procession. He was put to death in Rome, 29 B.C.

ANTIOCO ISLAND, SAN, an island at the southwestern extremity of the island of Sardinia, immediately N.W. of the Gulf of Palmas, and 45 miles S.W. of Cagliari. Its area is about 42 square miles, with a population of 2,300.

ANTIPAROS. See OLEAROS, in these Supplements.

ANTIPHANES, a name borne by at least five celebrities among the ancients. Of these the most noted were—1. A comic poet of the middle Attic comedy; born about 404 B.C., and died 330 B.C. He is said to have written as many plays as there were days in the year, 130 at least having come down to the present day. Meineke has issued them in his *Fragmenta, Comic, Græc.* (Vol. I, pp. 491–574). 2. Another of the name was of Berga, in Thrace. He wrote on incredible and marvelous things. 3. A Greek epigrammatic poet, of the reign of Augustus. 4. A sculptor of Argos, disciple of Polycletus and teacher of Cleon. 5. A physician of Delos, who flourished about 200 A.D.

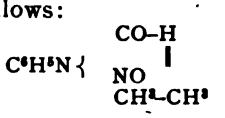
ANTIPHLOGISTIC, a term applied to remedies and to regimen, calculated to reduce inflammation and the heat of fevers, such as purgatives, antifebrins, cooling drinks, and occasionally blood-letting.

ANTIPODAL CELLS. In angiosperms, the macrospore (embryo-sac of the ovule) develops its gametophyte internally as a group of free cells. A group of three cells (egg-apparatus) is formed at the micropylar end of the embryo-sac; a solitary cell (endosperm nucleus) is placed more centrally; and a group of three (sometimes more) cells is formed at the opposite or antipodal end of the embryo-sac, known as the "antipodal cells." The antipodal cells represent, therefore, part of the vegetative structure of the female gametophyte. See figure under EMBRYO-SAC, in these Supplements.

ANTIPODES, a cluster of small uninhabited islands in the South Pacific, southeast of New Zealand, in lat. 49° 42′ S., long. 178° 43′ E., so styled from their nearly antipodal position to the Royal Observatory at Greenwich, near London, whence longitude is estimated for the British possessions.

ANTIPOPE, a pontiff elected in opposition to one canonically chosen. The first antipope was Felix, during the pontificate of Liberius (352–366). During the middle ages several emperors of Germany set up antipopes. In all, there were 44 antipopes, if one reckons the Avignon antipopes elected in consequence of the Great Schism of the West (1378–1429). Then Europe was scandalized by the spectacle of two popes, in turn hurling the most awful anathemas at each other, "snarling," as Wyclif said, "like two dogs over one bone."

ANTIPYRIN. As found in commerce, it is an artificial organic base, in the form of a white, crystalline powder, or in scales, remarkable for its ready solubility in water. It is produced by the action of phenyl-hydrazin on acetic ether, and the subsequent methylation of the product. Its constitution may be indicated by the designation of dimethylphenyloxypyrazol, or by dimethylphenylpyrazolon. This constitution, according to the elaborate researches of its discoverer, Dr. Ludwig Knorr, of Germany (1890), is seen in the formula grouped as follows:



Its most characteristic reactions are those it gives with perchloride of iron and nitrate of soda. The former produces a deep reddish-brown color in the neutral solution, the latter an intense emerald-green tint in the slightly acidulated solution. It gives an intense red coloration with chloride of iron. It is an extremely efficacious agent for the reduction of the morbid temperature in nearly all cases of febrile disorder, such as typhus, pneumonia, pulmonary phthisis, pleurisy, acute rheumatic gout and articular rheumatism, erysipelas, puerperal fever, scarlatina, inflammations, etc. It effects with high fever a reduction of temperature from three and a half to five and a half degrees. On account of its depression of the heart's action, it is a dangerous drug.

ANTI-RENT TROUBLES, an outbreak in parts of New York that resulted in the extirpation of the last traces of subinfeudation in that state. To induce settlements in New Netherland, the Dutch West India Company offered vast territorial grants, with feudal jurisdiction, to such of its members as should colonize a certain number of persons, within a prescribed period, on their lands. A number of such grants were made, and the owners of the fee were known in New York as patroons. Among the larger of these grants were the Van Rensselaer patent, Livingston Manor, the Hardenburg patent and the Holland purchase, in the central part of the colony. There were other large grants, but these were the chief, and the most valuable of them were in Rensselaer, Columbia, Albany, Greene and Delaware counties. The proprietors of these lands leased them to tenants for annual payments in kind, of which some were subsequently commuted into money. Alienations of leases carried with them a fine of one year's rent to the landlord,—a stipulation that was voided in 1787 by the state legislature. Two causes of irritation gave rise to outbreaks that lasted from 1839 to 1847: first, the refusal of the proprietors to sell their lands to tenants; second, distraint by the sheriff for

rents that had been allowed to fall into arrears, and which the tenants expected to have forgiven. Thus the heirs of Stephen Van Rensselaer, in 1839, brought ejectment suits for $400,000, delinquent dues, which had been accumulating for years. The service of the writs was resisted by tenant mobs, which were suppressed, in 1840, by the militia. Anti-rent associations were then formed, and their members came, disguised as Indians, to oppose the sheriff's officers, and even court sessions were broken up. In 1844–45, the sheriff of Columbia County was reduced to impotency, and two men were killed. At Delhi, in 1845, a deputy sheriff lost his life, and Delaware County was proclaimed to be in insurrection. Here more than a score of rioters were imprisoned, seven of them for life, and thrice as many fled from the county. The general feeling in the state was in favor of the tenants, and the anti-renters were able, in 1846, to secure the election of John A. Young as governor. He pardoned the offenders on the ground that they were political and not moral criminals. Suits were brought in the courts to test the rights of proprietors, and by judicial rulings and constitutional amendments this system of perpetual leaseholds was soon destroyed. See *Anti-Rent Agitation*, by E. P. Cheney (University of Pennsylvania publications, 1887).

ANTISCORBUTICS, remedies for the scurvy, such as lime-juice, fresh vegetables, etc. See SCURVY, Vol. XXI, p. 572.

ANTI-SEMITES, a name given to those who oppose the social, economic and political influence of Jews, regarding them as a people alien by lineage and faith to those among whom they dwell, without regard to place of nativity. In one sense, Anti-Semitism may be understood as embracing all those who at any time favor the suppression of Judaism or the persecution of Hebrews. In a narrower sense, it comprises a recent party which opposes the Jews by political methods. Political Anti-Semitism is unknown in the United States, but it has taken an acute form of activity in a number of European states, especially since the death of the Emperor William I, of Germany, who regarded hostility to the Jews as contemptible. The efforts of Adolf Stoecker, a court chaplain and popular preacher of Berlin, to create an agitation to exclude Jews in Prussia from civil rights virtually ended with his resignation, under official pressure, in 1890, of his chaplaincy. His work, however, was taken up by Boeckel and Ahlwardt, who were able to control a few votes in the Reichstag (in 1896 these numbered 17), and by casting them for the Army Bill in 1893, secured some recognition from the Conservatives. However, the same year, Ahlwardt was repudiated by the supporters of the government. In Prussia the Anti-Semites base their action upon the claim that German Judaism, through its control of the press, endeavors to overthrow Christianity, and that its practices are usurious and its influence immoral.

In France an outbreak of hostility to Israelites in January, 1893, was led by the Marquis de Morés, in connection with the Panama Canal scandals. He charged them with corrupting French honesty and despising principles of honor. The police were required to disperse his disorderly assemblies. The same year, in Switzerland, the Anti-Semites, chiefly Protestants, carried a law prohibiting as cruel the Jewish method of slaughtering animals for food. In Rumania it was enacted that, from the opening of 1893, Jewish children should be excluded from state schools, and in some districts Jewish families, resident therein for generations, were forcibly expelled.

In Austria-Hungary the movement is complicated by the political antagonisms of the races in that heterogeneous empire. When the Jews were excluded from the grain market of Vienna, they were invited to Budapest. Yet in the Reichsrath of this empire the Anti-Semites controlled, in 1895, 15 votes. This party came into antagonism with the court in Vienna, where they were able to elect Dr. Lüger burgomaster of the city in 1895. The Emperor refused to approve, and dissolved the municipal council, ordering a new election. In this movement the Anti-Semites were opposed by the Liberals. The contest was prolonged into 1896, the Viennese persisting in their support of Jewish ostracism.

In Russia there is a pale within which Jews are compelled to reside, as in the Ghettos of mediæval cities. The result of cooping them in towns is found to be more deleterious to social and sanitary conditions than persecution. In February, 1893, the right of unmolested residence within the pale, by families which had settled there prior to 1880, was revoked, but new measures were decreed, mitigating the restrictions formerly imposed upon the Israelites dwelling in frontier towns. The Hebrews who sought asylum in Turkey from Russian proscription were turned back, although, as a rule, in Mohammedan countries there is great toleration of the Mosaic religion and of its adherents.

Two causes give the Anti-Semitic movement an importance which it is to be hoped will prove unsubstantial. In the minute division of parties in European legislatures, government measures are often passed only by combinations adroitly formed by the cabinet. Hence the few votes controlled by the Anti-Semites give them a capital for political trading, and bring them into prominence. Again, there is the apprehension, in countries where the control of wealth and trade is in Jewish hands, that the Anti-Semite party may appeal to the socialistic tendencies of the working-people, and, under the guise of a race or religious conflict, a political party hostile to owners of capital and the security of government may thrive. The movement is watched with cautious interest, as containing germs of an unknown fruitage. Outside of Russia it has little countenance from courts, and there the young Czar, Nicholas II, on his coronation, bestowed tokens of favor upon representatives of Judaism, and under him the Hebrews have had some repose. It is probable

that European Anti-Semitism is more a socialistic than a race or religious agitation for the majority of those who take part in it.

ANTISPASMODICS, drugs which alleviate or cure spasms. They are generally noted for potent odors. Valerian, musk, ether, camphor and assafetida have been used, but the modern school of medicine goes further, and essays to find the causes that produce spasms, and by removing these causes restore the health of the patient.

ANTISTROPHE, in the ancient choruses and dances, a term employed to signify the return of the chorus, exactly answering to a previous strophe, except that they moved from left to right, instead of from right to left. In grammar the term is used to signify an inverted construction. In logic it refers to Aristotle's designation of the conversion or transposition of the terms of a proposition.

ANTITOXIN, a preparation found efficient as a remedy for diphtheria. It was first reported by Professor Behring, who had worked upon it with a Japanese, Kitasato, now professor at Tokyo, Japan. This discovery may be stated in the form of two propositions: 1. That animals which have once been made insusceptible to the diphtheria germ are proof against subsequent diphtheretic-poisoning. 2. That the blood of animals made insusceptible can act as an antidote to diphtheria poison. To prepare the antitoxin, a dose of diphtheria poison sufficient to give rise to a few days' slight illness is injected under the skin of some animal, usually a horse. As soon as the horse has regained its health, the injection is repeated, with a larger quantity of the poison. But the animal can now tolerate this amount with even less discomfort than it felt after the former smaller dose. This treatment is continued for several months, until the animal could not be killed by several hundred times as much poison as would suffice for the destruction of a fresh horse. At the end of a proper period of time, several gallons of blood are taken from the animal, and the serum or watery part of the blood is the antitoxin. A very slight dose injected under the skin into the blood causes relief from diphtheria within 24 hours, usually, if the case is dealt with soon enough. It also gives immunity to persons who have been exposed to the disease.

ANTLERS. See DEER, Vol. VII, p. 23.

ANT-LION, a name applied to the larval form of a neuropterous insect (*Myrmeleon*). The adult insect resembles the dragon-fly. They occur in sandy regions of various countries. The larva has a peculiar method of capturing its prey, chiefly ants. It digs a pitfall in the ground, conceals itself at the bottom, and waits for insects to fall into the trap. See ANT, Vol. II, p. 98.

ANTOFAGASTA, a province and city of northern Chile, taken from Bolivia in the war of 1879. It contains an area of 60,900 square miles, and is one of the richest regions in the world for mineral deposits, especially the ores of gold and silver. The capital and principal seaport is a thriving city of about 10,000 inhabitants. It has large smelting-works, and exports nitrate of soda and bullion. Population of the province in 1896, 35,851.

ANTOMMARCHI, FRANCESCO, physician, a native of Corsica; born about 1780. He was already an anatomist of some celebrity at Florence, when he was induced, in 1818, to go to St. Helena as physician to Napoleon. He was received at first with mistrust, but Napoleon ultimately gave him his full confidence, and at his death left him 100,000 francs. After his return to Europe he published, at Paris, his dubious book, *Les Derniers Moments de Napoléon* (1823). During the Polish revolution he did duty at Warsaw as director of military hospitals. He afterwards went to the West Indies, and died in Cuba, April 3, 1838.

ANTONELLI, GIACOMO, cardinal, born April 2, 1806, at Sonnino, a village situated near the Pontine Marshes. In 1819 he went to Rome and entered the Grand Seminary, where he proved himself one of the cleverest students of his time. He gained the favor of Pope Gregory XVI, who named him a prelato, and gave him some excellent ecclesiastical appointments. In 1841 Antonelli became under-secretary of state to the ministry of the interior; in 1844, second treasurer, and in the following year finance minister of the apostolic chambers. Pope Pius IX raised Antonelli to the dignity of cardinal deacon in 1847, and in 1848 he became president and minister of foreign affairs in a liberal cabinet, which framed the famous Statuto, or constitution, proclaimed in 1848. He accompanied the pope in his flight to Gaeta, and returned with him to Rome. At the date of his death, Nov. 6, 1876, the various posts held by Antonelli made him virtually prime minister to the pope.

ANTONIA, the name borne by two noted Roman matrons; the first was daughter of Mark Antony, the triumvir. She married Ahenobarbus and was Nero's grandmother. Her sister, often styled Antonia Minor, was the wife of Claudius Drusus Nero, and mother of Germanicus and the Emperor Claudius.

ANTONINUS, COLUMN OF, a pillar standing in the Piazza Colonna of Rome, erected by the Roman senate, probably as a memorial of Antoninus Pius. The style is a mingling of Corinthian and Doric, and upon the pillar are numerous figures representing the victories of Marcus Aurelius.

ANTONINUS, ITINERARY OF. See ANTONINI ITINERARIUM, Vol. II, p. 139; ITINERARIUM, Vol. XIII, p. 517.

ANTONIO DE SEDILLA, called "Père Antoine," Spanish clergyman; born in Spain about 1730; died in New Orleans in 1829. In 1779 he was sent to Louisiana as commissary of the Inquisition, with power to put it in force in that colony; but the governor, fearing a revolution if the Spanish laws against heretics were applied, seized Père Antoine and his companions and sent them back to Spain. Four years later he returned to New Orleans as priest of St. Louis Cathedral, and his goodness and charity made him the idol of the French population. He gave all he had

to the poor, and slept on hard boards in a rude hut that he built under a date-palm tree that stood in his garden. This tree has been the subject of many romances, and it retained life until 1886.

ANTONY OF PADUA, SAINT, born at Lisbon, Aug. 15, 1195; died at Padua, June 13, 1231. On the father's side he was related to Godfrey of Bouillon. He was at first an Augustinian monk, but in 1220 he entered the Franciscan order, and became one of its most active propagators. He preached in the south of France and Upper Italy. He was canonized by Gregory IX in the year 1232. According to legend, he preached to the fishes when men refused to hear him; hence he is the patron of the lower animals. See PADUA, Vol. XVIII, p. 131.

ANTRAIGUES, EMMANUEL LOUIS HENRI DE LAUNAY, COMTE D', a French politician, born at Ville-Neuve de Berg, in the department of Ardèche, in 1755. His talents were first displayed in his *Mémoires sur les États Généraux* (1788). In 1789, when he was chosen deputy, he defended the privileges of the hereditary aristocracy. After leaving the assembly in 1790, he was employed in diplomacy at St. Petersburg and Vienna, where he defended the cause of the Bourbons. In 1803 he was employed, under Alexander of Russia, in an embassy to Dresden. He afterward went to England, where he acquired great influence with Canning. On July 22, 1812, he was murdered, at his residence near London, by an Italian servant.

ANT-THRUSH OR ANT-CATCHER, names applied to birds of the family *Pittidæ*, which feed, to a large extent, upon ants. They are common in the islands of the Malay Archipelago. See PITTA, Vol. XIX, p. 149.

ANTWERP, a village of Jefferson County, in northern New York, on the Indian River, and is on Rome, Watertown and Ogdensburg railroad, 21 miles N.E. of Watertown. It carries on an extensive trade in iron. Here is situated the Northern New York Conference Seminary of the Methodist Episcopal Church. Population 1890, 912.

ANTWERP, a village of Paulding County, northwest Ohio; situated 70 miles S.W. of Toledo, on the Wabash railroad, between the Maumee River and the Six-mile Reservoir. It has a pig-iron furnace and clay-working and flour mills. Population 1890, 1,331.

ANUPSHAHR, a town of India, in the British district of Bulandshahr, Northwest Provinces, on the right bank of the Ganges, 73 miles S.E. of Delhi. Population, 14,000.

ANURA. See AMPHIBIA, Vol. I, p. 751.

ANYTE OF TEGEA, the female Homer of her day (209 B.C.). Twenty-two of her epigrams have come to the moderns, and afford considerable evidence of her reputation as a poetess.

AONLAGANY OR AOUNLAH, a town of India, in the British district of Bareilly, 21 miles S.W. of Bareilly, on the route to Aligarh. It has a large bazaar. Population, 11,000.

AORIST (Gr. *aoristos*, "unlimited"), a form of the Greek verb by which an action is expressed as taking place in an indefinite past time. It corresponds to the simple past tense in English. The distinction of the first and second aorist is purely formal.

AOSTA, DUKE OF, a title borne by the eldest son or brother of the reigning monarch of the House of Savoy (kings of Italy). Amadeus, king of Spain from Dec. 4, 1870, to Feb. 11, 1875 (died Jan. 18, 1890), was once the holder of this title. The dukes of Aosta take the title from AOSTA; q.v., Vol. II, p. 147.

APACHES, a tribe of Indians of New Mexico and Arizona. The Apaches, veritable Ishmaelites of Arizona and New Mexico, are raiders from their birth. Under their chief Geronimo, who became in 1876 the terror of the frontier, they repeatedly ravaged the settlements on the American side of the boundary, and, when pursued by troops, took refuge in the fastnesses of the mountains of Sonora. A convention with the Mexican government enables the troops of either power, in pursuit of marauding Indians, to follow, regardless of any international boundary. General Crook captured Geronimo in Mexico in 1883, and interned him at Fort Apache until his escape in 1885. His liberty was brief, as he was again captured by General Miles, in May, 1886; was for some time confined at Mount Vernon barracks, Alabama, and with the most troublesome of his band was removed, Oct. 2, 1895, to Fort Sill, Oklahoma. See INDIANS, Vol. XII, p. 827, note 1.

APAFI, MIHALY, OR ABAFFI, MICHAEL, a prince of Transylvania; born Sept. 25, 1632. He accompanied Prince George II in an expedition against the Poles in 1657; was taken prisoner at the irruption of Tatar hordes under their khan, Mohammed Girai, and in 1661 was chosen prince of Transylvania. He remained faithful to the Ottoman power till the siege of Vienna in 1683. The imperial troops penetrated into the country, and Apafi made a treaty with the emperor by which Transylvania was placed under German protection. At Fogaras, in 1688, the Transylvanian deputies took the oath of fealty to the Hapsburgs as legitimate monarchs of Hungary. Apafi died on the eve of a fierce retributive war begun by his old allies, the Turks, April 15, 1690.

APARTMENT-HOUSES. The dividing of buildings into apartments has come to be the common method in all large cities for accommodating a number of families under one roof. In the United States the flat is the favorite form of apartment, and architects have exercised much ingenuity in designing complete household accommodations within very limited spaces. As apartment-houses have grown in height, the questions of light and ventilation have received more study, and in the later styles the dark flat is seldom found. Two types of design now preferred as insuring light throughout are the "hour-glass" plan and the "slot" plan. These names refer to the design of the ground plan. The "hour-glass" type has central air and light shafts, and the "slot" type has a long, slot-like alley extending beside the building about three fifths of its length. An in-

novation in the conveniences of apartment-houses has appeared in Chicago, where there are buildings containing flats and extra spare bedrooms on the top floor which tenants can engage transiently for guests. There are also in these houses suites of reception-rooms, handsomely furnished, which occupants of the building are privileged to hire for an evening, when desirous of entertaining a large company. C. H. COCHRANE.

APATITE, a mineral composed largely of phosphate of lime, and, in its crystalline form, described at GEOLOGY, Vol. X, p. 228, and at MINERALOGY, Vol. XVI, p. 407. It also occurs massive, and is found in large beds in South Carolina and Florida, which furnish the principal supply for the American manufacture of superphosphates from rock. The beds, once important, of Sombrero, one of the Virgin Islands, in the West Indies, are now exhausted. The products of such beds are known as rock-phosphates and yield, when ground, and treated with sulphuric acid, a fertilizer called superphosphate in the trade. The proportion of phosphate of lime in these coprolites and bone deposits varies from 50 to 80 per cent. The beds are found in connection with marls. Massive apatite is imported to some extent from some small West Indian islands, Norway and Canada.

APERIENTS, substances which are employed to cause intestinal evacuations. Many articles of food, such as oatmeal, brown-bread, and bran biscuits, and fruits, such as figs, prunes and strawberries, are used for this purpose; but the term is usually applied to denote certain medicines which act upon the intestines and cause them to expel their contents.

APETALOUS, a term in botany, applied to flowers without petals. The name *Apetalæ* is frequently applied to an artificial group of dicotyledons in which the flowers are usually without petals. The group, and therefore the group-name, has been abandoned in modern schemes of classification, the different families having been intercalated among the polypetalous forms to which they are related. The absence of petals is due either to reduction from petaliferous forms, or it represents a primitive condition which precedes the differentiation of petals. Probably most of the apetalous families belong to the latter category. They, with the polypetalous families, have been combined in a group called *Archichlamydeæ*, as opposed to the *Sympetalæ*, or gamopetalous forms.

APHANIPTERA, a name applied to an order of insects composed of the family of fleas (*Pulicidæ*). Some authors consider them wingless flies, and accordingly class the family under *Diptera*.

APHELION, that point in the elliptical orbit of a planet which is most remote from the sun. The opposite point, or that nearest the sun, is styled the perihelion. At the former point the swiftness of the planet's motion is least and begins to increase, and at the latter its motion is the greatest and begins to decrease. This irregularity of the motion is most remarkable in comets, whose orbits deviate most from the circle. The motion of the comet of 1680 at its perihelion was calculated as 137,000 times more than its motion in aphelion.

APHIDES. See INSECTS, Vol. XIII, p. 153; ANTS, Vol. I, p. 96; WHEAT, Vol. XXIV, p. 535.

APHONIA. See THROAT DISEASES, Vol. XXIII, p. 320.

APHTHÆ, small whitish ulcers, commencing as vesicles on the surface of a mucous membrane, usually that of the mouth and lips, but they occasionally appear wherever mucous membrane approaches the skin. Infants are liable to an aphthous eruption termed thrush.

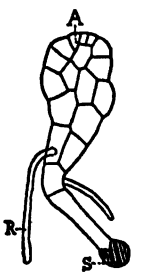
APHTHARTODOCETÆ, a religious sect that existed between the sixth and ninths centuries. See JUSTINIAN, Vol. XIII, p. 796.

APIA, the capital of the Samoan or Navigator's Islands, in the South Pacific Ocean. It is situated on the north coast of the Island of Upolu, and is divided into three parts, or villages, by small streams. The harbor, if harbor it can be called, is the space between a dangerous coral reef and the shore. Here, March 15, 1889, a hurricane drove the United States ships *Trenton*, *Vandalia*, and *Nipsic*, and the *Adler*, *Eber* and *Olga* of the German navy, ashore. The loss of life was: American navy, 4 officers, 46 men; German navy, 9 officers, 87 men. The British corvette *Calliope* alone steamed to sea in the teeth of the gale. At Vailima, near Apia, Robert Louis Stevenson, the celebrated novelist, died, Dec. 3, 1894.

APIAN OR APPIAN, PETER (1495–1552), a German astronomer and mathematician, born in Leysnick, who originated a mode of finding longitude by lunar observation, and published trigonometrical tables with radius decimally divided. His chief and best work was geographical, and contains early American maps. He was ennobled by the emperor, and died at Ingoldstadt. His German patronymic was Bienewitz.

APIARIES. See BEE, Vol. III, pp. 499–501; also BEE, in these Supplements.

APICAL CELL, in botany, applies specifically to the embryonic cell situated in the organic center of a growing-point of multicellular plants, as in certain algæ, mosses, and most pteridophytes. The apical cell is larger than its neighbors, and pyramidal (two-sided or three-sided) in form. All the new cells of the growing-point are derived from the apical cell by successive divisions, the apical cell maintaining its size by continued growth. In some cases (as in *Selaginella*) there is a group of such apical cells; while in other multicellular plants the apical cell or cells are replaced by a group of small meristem cells.



Prothallium of *Pteris aquilina* showing; A, Apical cell; R, Rhizoid; S, The spore from which the prothallium has developed. (Original.)

APICULTURE. See BEE, Vol. III, pp. 501–503. For American bee culture, see HONEY, Vol.

XII, pp. 138, 139; and under BEE, in these Supplements.

APIOS TUBEROSA, a plant belonging to the family *Leguminosæ*. This plant, which is a native of the Atlantic and middle states, has for a century been cultivated in botanical gardens in Europe, and has been recently brought into particular notice through the French traveler, Lamare-Picquot, who convinced himself of the value of the tubers as an article of food. They contain more nitrogen than potatoes (4.5 per cent), and also more starch. The flowers are dark red. It is called "ground-nut" or "wild bean."

APLANATIC LENS, a lens which causes all the rays of light to converge to a point. See MICROSCOPE, Vol. XVI, p. 260; TELESCOPE, XXIII, p. 144.

APLANOGAMETE, a term applied in general to non-ciliated gametes (sexual cells), as the gametes of *Spirogyra* and the *Diatoms;* but in plants with differentiation of sexual cells the term is usually restricted to a non-ciliated male gamete.

APLYSIA. See MOLLUSCA, Vol. XVI, pp. 656–660.

APOCALYPTIC NUMBER, "the mystical number" 666, spoken of in the book of Revelation. As early as the second century, the church had found that the name *Antichrist* was indicated by the Greek characters expressive of this number, while others believed it to express a date. The most probable interpretation is that which was current in the days of Irenæus, and which found the number in the word *Lateinos.* The Roman nation, the mightiest pagan power on earth, was the most terrible symbol of antichrist, and the number 666 appears in the Greek characters which spell the name. Some Protestant controversialists apply the prophesy to Papal Rome, but it is equally applicable to certain reformers of that denomination.

APOCATASTASIS, in theology, the final restitution of all things, when, at the appearance of the Messiah, the kingdom of God shall be extended over the whole earth. In a dogmatic sense the name is applied to the future conversion of all men to the faith of Christ, and their consequent admission to everlasting blessedness. See ESCHATOLOGY, Vol. VIII, p. 538.

APOCRENIC ACID, one of the products of the natural decay of wood and other plant textures, found wherever lignin, or woody fiber, is decomposing in soils, etc. As apocrenic acid is soluble in water, it follows that rain-water, falling on and percolating through soils containing this substance, becomes impregnated with it, and hence in many natural waters apocrenic acid is a recognized constituent. Apocrenic acid performs an important function in the growth of plants, as there is every reason to believe that it forms one of the stages through which matter travels from dead plants again into the living tissue.

APOCYNACEÆ, a family of dicotyledonous plants, consisting of trees and shrubs, generally with milky juice, having entire leaves and no stipules. The calyx is usually five-parted; the corolla hypogynous, gamopetalous, often with scales in its throat, regularly five-lobed; stamens five, inserted on the corolla; ovaries, two, each one-celled, with numerous ovules; in fruit becoming a follicle, capsule, drupe or berry. The species are mostly tropical, and often of economic value, some furnishing india-rubber, others valuable woods and fibers, still others medicinal barks and edible fruits. Among cultivated species are periwinkle (*Vinca*), oleander (*Nerium*), cape jasmine (*Rhynchospermum*), and various species of *Allamanda.*

APODES OR APODAL FISHES, fishes without analogues of the ventral or pelvic fins. According to recent authors, the group is limited to the eels.

APOGAMY. In alternation of generations in plants the rule is, that the sporophyte is developed from a spore produced sexually by the gametophyte. Apogamy is the term applied to cases in which the sporophyte arises in some other way, either by budding directly from the vegetative body of the gametophyte, which is *vegetative apogamy*, as in certain ferns and fungi, or by the direct development of the female cell without fertilization, which is *parthenogenesis*, or *parthenogenetic apogamy*, as in certain fungi.

APOGEE, a term etymologically meaning "away from the earth," and used in astronomy to denote a point in the orbit of any body in the planetary system which is farthest from the earth. Originally the earth was considered to be the center of the solar system, and hence to be the point from which measurement should be made, and at one time the sun was said to pass to its apogee; but when the sun was recognized as the center, the expression for the same relation was changed, and the earth said to be in "aphelion,"—that is, at its remotest point from the sun. The word has its most appropriate application to the moon, because it revolves as a satellite around the earth. When nearest the earth the moon is said to be in "perigee," and the full cycle of either is nearly nine and a half years. These two words, when used rhetorically, signify the greatest approximation or separation of things, one from another, whether in space or character.

APOLLINARIS WATER, an alkaline mineral water containing carbonate of soda, derived from the Apollinaris spring, in the valley of the Ahr, in the Rhine province. It is rich in carbonic acid and is popular for table-use. The consumption of this water is so considerable in America as to give fair ground for the belief that much of what is sold is artificially prepared.

APOLLINARIUS OF LAODICEA OR APOLLONARIS THE YOUNGER, bishop of Laodicea, in Syria (362), and one of the warmest opponents of Arianism. It was chiefly as a controversial theologian, and as the founder of a sect, that Apollinarius is celebrated. He maintained the doctrine that the *Logos*, or divine nature in Christ, took the place of the rational human soul or mind, and that the body of Christ was a spiritualized and glorified form of humanity.

APOLLO, a borough in Armstrong County, western Pennsylvania, situated on the Kiskiminetas River, and on the line of the Pennsylvania railroad. It is in the midst of the Pennsylvania coal-fields, and has mines, rolling-mills, and steel-works. Population 1890, 2,156.

APOLLONIUS OF TYRE. See ROMANCE, Vol. XX, p. 635.

APOLLYON. It is to its use in Bunyan's *Pilgrim's Progress* that the name now mainly owes its currency. See ABADDON, in these Supplements.

APOLOGETICS. See APOLOGETICS, Vol. II, pp. 189–193; DOGMATIC, Vol. VII, p. 339; THEOLOGY, Vol. XXIII, p. 274.

APOLOGY OF AUGSBURG. See CREEDS, Vol. VI, p. 564.

APOPHYLLITE. See MINERALOGY, Vol. XVI, p. 421.

APOPKA, a town of Orange County, east-central Florida, near the northeastern shore of Lake Apopka, in the middle of the peninsula. It is the center of a lumber and pasture region, contains many orange groves, and is the seat of an academy. The Florida Central and the Florida Midland railroads traverse the town. Population 1890, 490.

APOSPORY refers to the fact that in plants with alternation of generations the gametophyte is sometimes produced directly by budding from the sporophyte, as in certain ferns, instead of from a spore produced asexually by the sporophyte.

A POSTERIORI. See A PRIORI, Vol. II, pp. 214, 215.

APOSTLES, TEACHING OF THE TWELVE, the title of a treatise discovered in 1883 by Bryennius, the metropolitan of Nicomedia, and published by him with a Greek commentary. The work is moral rather than dogmatic in tone, and is of great interest for the history of the early Christian Church; but it throws no fresh light on the New Testament canon, and does nothing to settle the Johannine origin of the Fourth Gospel. The date of the treatise is uncertain; some scholars fix it at 80–100 A.D.; Harnack contends for 120–165; and one hostile critic places it after the *Constitutions*, which are supposed to have been based upon it. English translations include those by Farrar, Spence and Schaff. In 1887 the Johns Hopkins University, of Baltimore, produced a fac-simile of the original.

APOSTLES' ISLANDS, a group of 27 small islands in Lake Superior, first settled by the French in 1680. They belong to the state of Wisconsin, lie 70 miles W. of Ontonagon, and have an area of 200 square miles. A fine quality of brownstone is quarried and shipped from the islands.

APOSTOLIC MAJESTY, a title of the kings of Hungary, first conferred by Pope Sylvester II, in 1,000 A.D., on the then Duke of Hungary. In 1758 Maria Theresa obtained a renewal of the title from Pope Clement XIII. See HUNGARY, Vol XII, p. 367.

APOSTOLIC PARTY, a name given to a party of fanatical Catholics in Spain, who were also absolutists so far as the king consented to be their instrument. They formed themselves (soon after the revolution of 1819) into an Apostolic party, whose leaders were fugitive priests and whose troops were smugglers and robbers. After taking an active part in all the subsequent agitations, they finally merged (1830) into the Carlist party.

APOSTOLIC SUCCESSION, a phrase used in religious matters to denote either one or both of two distinct things; i. e., (1) "the derivation of holy orders by an unbroken chain of transmission from the Apostles; and (2) the succession of a priesthood so ordained to the powers and privileges of the Apostles." The first is a question of fact, to be determined by history and chronology. The second is a matter of opinion or belief, the Roman Catholic Church and the various Protestant churches differing widely from each other in their views. The Roman Catholic Church styles itself "the Apostolic Church," because the pope is claimed to be the lineal successor of Peter in the Papal chair; the Church of England and the Scottish Episcopal Church also claim apostolic succession, in view of the ordination of their bishops at Rome before the Reformation, and so, also, does the Protestant Episcopal Church of the United States. The advocates of this doctrine in the Protestant Episcopal churches may be divided into two classes: 1. Those who believe that episcopacy is the best form of church government and is of apostolic origin. These prefer to call their doctrine that of the "Historic Episcopate." 2. Those who believe the preceding, and also that men possess the grace proper to the Christian ministry only after ordination by the laying on of the hands of a bishop who can trace his ordination as bishop through a line of bishops to the Apostles. The arguments against the theory of Apostolic Succession are many and varied, for which the reader is referred to *The Organization of the Early Christian Churches*, in the Bampton Lectures for 1880. F. J.

APOSTOOL, SAMUEL, a Dutch theologian of the Mennonite persuasion; born in 1638. He became the minister of an Amsterdam congregation and was involved in a dispute about doctrine with Galenus. His action split the Waterlandian congregations into two sects, the Apostoolians and the Galenists. He died about 1700.

APOSTROPHE (Gr., "a turning away or breaking off"), a rhetorical figure by which a speaker changes the course of his speech, and addresses, with greater or less emotional emphasis, persons present or absent, the dead, or inanimate objects, either to invoke them as witnesses or to pity, praise or blame them. When the figure is well managed it has a thrilling effect, both in oratory and poetry, but when extravagantly introduced it becomes ludicrous. In manuscript or print the term denotes a raised comma used to mark a possessive suffix *s*, or the elision of a vowel in a word.

APOTHECARIES' WEIGHT, a series of mea-

sures used by apothecaries. The unit is a grain, whereof 20 make 1 scruple, 3 scruples make 1 dram, 8 drams make 1 ounce, 12 ounces make 1 pound. For its symbols, see ABBREVIATORY SIGNS, in these Supplements.

APPALACHEES, a tribe of Florida Indians, from whom Appalachee Bay was named. They were subjugated by the Spaniards, and reduced by the English from 7,000 to 400 in 1705, and were soon after absorbed by the Choctaws, to whom they were allied. See *Appalachian Races*, under INDIANS, Vol. XII, p. 828.

APPALACHIAN CLUB, an association of savants whose object is the systematic exploration of the Appalachian ranges. It originated in Boston in 1876. The club superintends the placing of guide-boards, and essays to prevent the disfiguration of the face of nature by advertisement-painting. Discoveries in botany, zoölogy and geology are also reported.

APPALACHIAN INDIANS, a name sometimes applied to a linguistic family of North American Indians, embracing the greater part of the tribes of the southern United States. See INDIANS, AMERICAN, Vol. XII, p. 828.

APPALACHICOLA, a river and bay of Florida. The river is formed by the confluence of the Chattahoochee and Flint, and flows nearly south into a bay of the same name in the Gulf of Mexico. It is about 90 miles in length and is navigable for steamboats.

APPALACHICOLA, a city and port of entry, capital of Franklin County, in west-central Florida, is situated on the Gulf of Mexico, at the mouth of Appalachicola River, some 80 miles S.W. from Tallahassee. It has a timber trade, extensive cotton shipments, a good anchorage, and weekly steamboat communication with Columbus, Georgia, and other places on the Flint, Chattahoochee and Appalachicola rivers, connecting at Chattahoochee with the Plant and other railroad systems. Population 1880, 1,336; 1890, 2,727.

APPANAGE. See APANAGE, Vol. II, p. 147.

APPARATUS SCULPTORIS, "the Sculptor's Workshop," is the name of a constellation which is hardly visible in the northern hemisphere, and which contains no bright stars. It is situated near the southern horizon, south of Cetis and Aquarius, and just east of the large star, Formalhault.

APPARENT, an astronomical term expressing certain important conditions. Apparent magnitude is the angle subtended at the observer's eye by the diameter of a heavenly body. Apparent altitude is altitude observed from the earth's surface, as distinguished from altitude referred to the earth's center. Apparent motion is the motion of a moving body as it appears to an observer who himself is in motion. It is expressed in terms of apparent velocity and apparent direction.

APPEAL. In law, the word *appeal* means the removal of a cause from an inferior to a superior or appellate tribunal for the purpose of having the judgment reviewed or the cause retried. An appeal can be taken only from a final judgment or decree, and not from an interlocutory or provisional judgment or order except when expressly provided by statute. Upon appeal, both the facts and the legal questions are generally submitted to review. In the United States, the courts of last resort, or those from which no further appeal can be taken, are the supreme courts of the various states in matters entirely within the jurisdiction of the state courts, and the supreme court of the United States in litigation which arises in the Federal or United States courts, and in a few excepted cases arising in the state courts. The time in which an appeal can be taken is generally fixed by statute, and if not taken within that time the right is lost. Upon an appeal being taken, it generally acts as a *supersedeas*, or stay of the proceedings, in the lower court, and no further steps can be taken in that court until the final determination of the appeal. A record, showing all the proceedings in the lower court, must be prepared and filed in the appellate court for its use in determining the questions involved. In criminal proceedings an appeal will lie at the instance of the accused if he is found guilty, but if acquitted, no appeal can be taken. See APPEAL, Vol. II, p. 208.

APPEARANCE, in legal proceedings, is the presence in court of any party to the suit, whether voluntary or involuntary, but the term is usually applied to the formal submission by the defendant to the jurisdiction of the court. It may be special, when made for particular purposes, or general, when absolute and unconditional. The performance of some act from which an appearance may be inferred will often suffice, and in civil cases it may be made by an attorney; in criminal cases, especially those of felony, the personal appearance of the accused is requisite. Appearance may be by filing in the cause a written statement that the defendant appears and submits himself to the jurisdiction of the court, which statement may be signed by the defendant personally or by attorney. Written appearance is in frequent use in chancery proceedings, and when filed in proper time generally entitles the defendant to additional time in which to file his answer.

APPEL, THOMAS GILMORE (sometimes spelled APPLE), a clergyman and educator (German Reformed), was born at Easton, Pennsylvania, Nov. 14, 1829, and graduated from Marshall College in 1850. Ordained in 1853, he became the first president of Mercersburg College upon its organization in 1865; was afterward professor in the Lancaster Theological Seminary, and in 1877 accepted the presidency of the Franklin and Marshall College. A prolific writer, he has been a leader of irenical opinion within his denomination.

APPENDICITIS. See SURGERY, AMERICAN, in these Supplements.

APPENDIX VERMIFORMIS, a small pouched vessel at the lower part of the cæcum, which hangs in the abdomen in a wormlike shape. Its func-

tions are unknown, but certain morbid conditions of the appendix, called appendicitis, are frequently the cause of death. In some cases the presence of foreign substances is the primary cause of the trouble, which, however, is more immediately brought to the patient's notice as the result of exposure to cold, of a violent strain or heavy fall, or of errors in diet. Among the symptoms are abdominal or umbilical pains, chills, fever, vomiting and constipation. If these symptoms are aggravated and increasing, death may result in a few hours. Surgical removal of the appendix is often resorted to as the patient's only means of relief or recovery. See DIGESTIVE ORGANS, Vol. VII, p. 228.

APPERCEPTION, a psychological term used by Leibnitz and Coleridge, with other philosophers. In Kant's sense, the ego cannot become conscious of its unity and identity except through the experience of some particular arising outside of itself. A perception thus related to self-consciousness he termed an apperception. In a more modern use, apperception is a perception when made subject to a rational process, or when reflected upon by the understanding. It is a step in making experience intelligible, and therefore is much used by pedagogists in theories of education. In Porter's *Human Intellect*, consciousness implies "a perception of the mind's own states, in addition to the perception of the objects of those states." Perception thus augmented is apperception.

APPERT, BENJAMIN NICOLAS MARIE, a French philanthropist and educator, was born in Paris, Sept. 10, 1797; devoted his life to ameliorating the condition of workingmen, soldiers and criminals. He published numerous works based on his personal investigations of the penal institutions and hospitals of many European countries, and his *Manual for Regimental Schools* (1822) is still in use.

APPERT, FRANÇOIS, a French technologist, brother of the philanthropist, was born in Paris in 1780. He discovered, in 1804, a food-preserving process of merit, which, in consideration of a bonus of 12,000 francs from the French government, he published in 1836. His book being immediately translated into every language of Europe, he received but slight pecuniary benefit from the invention, and died poor, in 1840.

APPLE-BLIGHT, a dangerous bacterial disease attacking the stems and leaves of apple trees. When the younger branchlets are attacked the leaves blacken and die as if blasted. The bacterial nature of the disease has been demonstrated by obtaining pure cultures of the parasite (*Bacillus amylovorus*) and inoculating healthy twigs. The bacteria absorb the nutritive cell-substances, or so modify them as to cause starvation of the host cells.

APPLEDORE, a small fishing-village on the north coast of the county of Devon, England, at the mouth of the Taw and Torridge rivers. It is mainly celebrated as the scene of some of the earlier portions of the Rev. Charles Kingsley's *Westward Ho*, and from its proximity to the Hubba Stone, the fabled location of the defeat of Hubba's Danes and the capture of the Raven Banner. In Elizabethan days its fishermen rivaled "the men of Bideford in Devon" in American exploration under Raleigh, and in harrying the Spanish Main under Drake and Grenville.

APPLEDORE, an island off the coast of New Hampshire, seven miles directly E. from Rye Beach. It is one of the group known as the Isles of Shoals. Appledore is a famous summer resort, its hotel accommodations and picturesque scenery attracting many visitors. The island was for many years the home of the poetess Celia Thaxter.

APPLE-OIL ($C^{10}H^{11}OC^{10}H^{9}O^{2}$), valerate of amyl, a salt of valeric acid which gives forth the odor of apples. Used in perfumery.

APPLES OF SODOM, a fruit which is supposed to grow on the borders of the Dead Sea, and which was once popularly believed to dissolve into dust and ashes when plucked. The "apples of Sodom" are identified by Robinson as the fruit of the *Asclepias gigantea*, which the Arabs call *osher*. Tacitus and Josephus make mention of the tree, and it has been described by several modern travelers.

APPLETON, a city, the capital of Outagamie County, east-central Wisconsin; 119 miles N.W. from Milwaukee; on the left bank of the Fox River, at the locality formerly called the Grande Chute; contains Appleton College and Lawrence University; is well equipped with railroads and steamboat facilities, and has a valuable water-power, utilized in extensive manufactures of paper, pulp, boots and shoes, agricultural implements, furniture, etc. Population 1890, 11,869; 1895, 14,641.

APPLETON, CHARLES EDWARD, born at Reading, England, March 16, 1841; died at Luxor, in Upper Egypt, in 1879. He was educated at Oxford and in Germany. His reading was wide and varied, but he wrote little. He took a lively interest in the movement for the "endowment of research," and founded in 1869 the *Academy*, whose special feature is its signed articles.

APPLETON, DANIEL, an American publisher and founder of the publishing-house of D. Appleton & Co., New York; born in Haverhill, Massachusetts, Dec. 10, 1785; died in New York City, March 27, 1849. His first publishing venture was a collection of religious extracts, entitled *Daily Crumbs from the Master's Table*, and later, *A Refuge in Time of Plague and Pestilence*. In 1838 his eldest son, W. H. Appleton, was taken into partnership; in 1848, Daniel Appleton retired, and his second son, John Adams Appleton, became a member of the firm. Subsequently three other sons, Daniel Sidney, George Swett and Samuel Francis, became partners. The publications of the house now extend over the entire field of literature, and it is one of the best-known firms in the world. The present members of the firm are the son, William H., and the grandsons, William Worthen, Daniel and Edward Dale Appleton.

APPLETON, DANIEL SIDNEY, an American

publisher; born in Boston, Mass., April 9, 1824; died Nov. 13, 1890. He graduated at Yale College in 1843, and, after studying law for a year, went to London as the agent of the publishing house of D. Appleton & Co., which had been founded by his father, Daniel Appleton. He returned home in 1849, and became a member of the firm, having for his special department the manufacturing details of book-making. His particular gifts were the making of estimates, and dealing readily with other important matters that required an active mind and sureness of judgment.



D. S. APPLETON.

APPLETON, JESSE, an American educator; born in New Ipswich, New Hampshire, Nov. 17, 1772; died in Brunswick, Maine, Nov. 12, 1819; graduated at Dartmouth, studied theology, and was ordained a Congregational minister in 1797; became president of Bowdoin College in 1807. His writings were collected and published in a two-volume edition entitled *The Works of Jesse Appleton, D.D.* (Andover, 1836).

APPLETON, JOHN, an American lawyer and diplomatist, was born in Beverly, Massachusetts, Feb. 11, 1815. After graduation at Bowdoin College in 1834, he settled at Portland, Maine, where he became a member of the bar, editor of the *Eastern Argus*, and register of probate. Later, he served as chief clerk in the Navy and State Departments, and went to Bolivia as *chargé d'affaires* in 1848. He was a member of Congress in 1851–52; appointed secretary of legation at London in 1855; assistant secretary of state in 1857, and United States minister to Russia under President Buchanan in 1860. He died at Portland, Maine, Aug, 22, 1864.

APPLETON, JOHN HOWARD, an American chemist; born in Portland, Maine, Feb. 3, 1844; graduated at Brown University in 1863; the following year became instructor in chemistry, and in 1872 professor of chemistry in that institution. He published *The Young Chemist* (1878), *Qualitative Analysis* (1878), *Quantitative Analysis* (1881), and *Chemistry of Non-Metals* (1884).

APPLETON, JOHN JAMES, diplomatist; born in France about 1789; died in Rennes, France, March 4, 1864; graduated at Harvard in 1813. In Monroe's administration was secretary of legation in Brazil, and later *chargé d'affaires* for the United States at Madrid and at Stockholm.

APPLETON, NATHAN, merchant, was born in New Ipswich, New Hampshire, Oct. 6, 1779; removed to Boston, Massachusetts, in 1796. In 1813 he aided in introducing into the United States the use of the power-loom for the manufacture of cotton cloth, and afterward aided in establishing the first cotton factories at Lowell, Massachusetts, of which city he was one of the founders. He was a writer upon subjects of political economy, and was several times a member of Congress and of the Massachusetts legislature; was a member of the Academy of Sciences and Arts, and also of the Massachusetts Historical Society. He died in Boston, July 14, 1861.

APPLETON, SAMUEL, merchant and philanthropist, was born in New Ipswich, New Hampshire, June 22, 1766; died in Boston, Massachusetts, July 12, 1853. In 1794 he established himself at Boston as an importer, and soon took his brother, Nathan, into partnership, and later joined with him in establishing and developing the manufacturing interests of New England. He resided much abroad; distributed freely, from a large income, to charity, and at his death left $2,000,000 for the same ends. He died childless.

APPLETON, THOMAS GOLD, an American author, son of Nathan Appleton, and brother-in-law of the poet Longfellow, was born in Boston, Massachusetts, March 31, 1812, and died in New York City, April 17, 1884. He was an accomplished amateur painter and a noted wit. Among his published works are *Nile Journal* (1876), and *Syrian Sunshine* (1877).

APPLETON, WILLIAM, an American merchant; born in Brookfield, Massachusetts, Nov. 16, 1786; died in Longwood, Massachusetts, Feb. 20, 1862. For 50 years he was a successful merchant in Boston; was president of the United States Branch Bank and of the Massachusetts General Hospital. From 1851 to 1855 he was a member of Congress, and again in 1861 in the special session.

APPLETON CITY, a village and township of the same name in the northwest part of St. Clair County, west-central Missouri; a farmer's mart, in an agricultural region. Population 1890, 1,081.

APPLE-TREE BORER (*Saperda candida*) is a native American insect, and has for ages infested crab-apple trees. It also attacks the quinces, mountain-ash, hawthorn, pear, and June-berry, and does a great deal of damage to orchards in various localities, but especially in New England and the middle states. The borer is the larva of the insect. When fully grown it is about an inch long, and the first segment a quarter of an inch thick. Its color is light yellow, but the head is chestnut-brown, polished and horny, and the jaws are deep black. The perfect beetle comes forth from the trunks of the trees at night, early in June, and moves and flies about in search of companions and food.

As the female beetle will not lay her eggs upon trees protected by alkaline washes, a good preventive is found in applying soft soap mixed with the lye from wood-ashes, thinned with water, to the base of the tree. The borer is rarely found above a foot or two from the ground, at the surface of which its devastation is greatest.

APPLING, a village and capital of Columbia County, in east-central Georgia; so named in honor of Colonel Daniel Appling, of the United States army, of Sackett's Harbor and Plattsburg fame, who was a native of this county. Population 1890 (militia district), 1,640.

APPOGGIATURA, in music, a grace-note, or note introduced as an ornament, but not essential to the harmony or melody. Theoretically, it borrows its time from the long note that follows it, but in practice this is not always done.

APPOINTMENT, in law, the exercise of certain powers reserved in common-law conveyance, such as powers jointuring, selling, charging land with payment of money, etc. An appointment may be made either by deed or will, but is merely ancillary to the instrument in which the power of appointment is reserved, and from which the party in whose favor the appointment is made for most purposes derives his title.

APPOLD, JOHN GEORGE, an English inventor; born in London, April 14, 1800; died at Clifton, Aug. 31, 1865. Among his numerous inventions were a brake for use in laying submarine cables, a commercially successful and secret process for dressing furs, and the pump noticed at HYDROMECHANICS, Vol. XII, p. 534.

APPOMATTOX, a branch of the James River, about 150 miles long, rising in Appomattox County, in central Virginia, flowing eastward by Farmville and Petersburg, and emptying into the James at City Point and Bermuda Hundred. It is navigable for 20 miles from its mouth.

APPOMATTOX COURTHOUSE, a village and capital of Appomattox County, in south-central Virginia. General Lee here surrendered the army of northern Virginia, together with a large amount of public property, arms and artillery to General Grant, April 9, 1865. This surrender caused the collapse of the Confederate government. On Feb. 3, 1892, the old courthouse building was destroyed by fire.

APPORTIONMENT, in law, is dividing into portions or shares. It is the equitable distribution or division of property among the persons entitled to share in such division, in proportion to their respective rights or claims. The question of apportionment arises in cases where a lien attaches to several pieces of land, the rule being that the several owners must bear the burden of the encumbrance in proportion to their respective interests. Apportionment of contracts is the allowance of a part of the consideration upon part performance of the contract, which allowance is a proportionate sum for the part of the contract which has been performed. based upon the entire consideration. When the contract is to complete an entire act, and the consideration is one specified sum as compensation for that act, the contract is generally not apportionable, but must be fully performed before any compensation can be required. Apportionment of rent may occur where the lease is terminated at some other period than that at which a payment accrues.

APPORTIONMENT OF CONGRESSIONAL REPRESENTATIVES. See CONGRESS, in these Supplements.

APPRAISEMENT, the act of estimating the value of property. The person making the estimate is called the appraiser. Appraisement is required to be made of property taken under distress for rent. It is also necessary to appraise the property of persons dying intestate, of insolvents, of persons scheduling personal property under the exemption laws, and in many other cases arising in legal proceedings. An appraisement should contain a correct and complete inventory of the property to be appraised, with the value of each article. See APPRAISER, Vol. II, p. 212.

APPROACHES, a term, in fortification, signifying the trenches, excavations and protected ways by which a besieging force seeks unobserved access to a stronghold of the enemy.

APPROBATE AND REPROBATE, a technical expression, in the law of Scotland, which signifies one of those rules of justice which commend themselves by their reasonable logic, and which are to be found in all enlightened systems of jurisprudence. It simply means that no one can be permitted to approbate and reprobate; that is, to accept and reject the same deed or instrument. The analogous doctrine in the law of England and the United States is called election. It is chiefly in the case of wills and other testamentary dispositions that this legal doctrine most frequently arises in practice, although it extends to all other writings, deeds and instruments.

APPROPRIATION is making something the property of a particular person, or setting property aside for a special use. The word has various important applications in law: 1. Where so much iron or oil, for instance, has been sold, but the quantity is not separated by weight or measurement from a larger mass, or where a certain proportion is sold, but the exact quantity or price is not known until measurement, etc.; in such cases the risk of the goods perishing and the substantial ownership do not pass to the buyer. Before delivery, however, the goods may be appropriated so as to produce this effect. 2. When a bill is drawn against goods, and the bill of lading is sent as a security to the acceptor, the goods are said to be appropriated to the payment of the bill. 3. Where several debts are due to the same creditor, the debtor, in making a payment, may appropriate it to a particular debt. If he does not do so, the creditor may apply it as he pleases. Where the parties say nothing, the law appropriates the payments in order of date.

APPROVER, in the law of England, is a person who has been an accomplice in the perpetration of a crime, but who is admitted to give evidence against his fellow prisoner or prisoners. Formerly it was applied to one guilty of treason or felony, who confessed on the promise of a pardon, conditional on the conviction of those implicated by his evidence. The modern practice in England is to admit an accomplice to give evidence for the prosecution, there called king's or queen's evidence, in any case where the conviction of the principal offender is dubious without such aid. No promise, express or implied, of favor or pardon can be held out, and the committing magistrate must expressly caution each

prisoner in committing him that he can expect nothing by such a course. Of course, in practice, an accomplice who has aided the crown by confession and evidence is always more leniently dealt with. The evidence of an accomplice is, in practice, only received after a plea of guilty filed by him, and requires the previous sanction of the judge, and a motion is usually made at the trial for leave to admit the accomplice for that purpose, which leave is not given unless the evidence appears to be necessary and likely to be corroborated. The testimony of an accomplice is regarded with suspicion and requires corroboration. The term in the law of Scotland analogous to that of approver is *socius criminis*, and the principles on which the *socius* is admitted, and on which his evidence is left to the jury, are the same as in England. An analogy to this term is found in the United States in the well-known state's evidence. To secure the conviction of an offender when otherwise it would be impossible to procure evidence against him, an arrangement is generally made by the state's attorney, who, subject to slight supervision by the court, is supreme and in control of a criminal prosecution, whereby an accessary turning state's evidence secures immunity for himself.

APPUI, support. In military phrase, *point d'appui* signifies a suitable station or position for supporting the tactical operations of a body of troops.

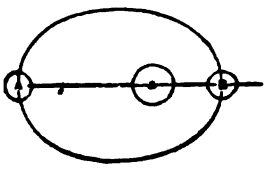
APRAXIN OR APRAKSIN, FEODOR MATVEÏEVICH, COUNT, a Russian admiral closely connected with the imperial family, was born in 1671; commenced at the age of twelve a notable career, in which he held many important offices, built fortresses, seaports and ships, and helped Peter the Great to create the Russian navy; led armies, gained victories and repelled invasions both by sea and land; became the inseparable companion and political favorite of his sovereign, and acquired an influence which two convictions of having defrauded the revenue failed to destroy. He died childless, Nov. 10, 1728. His brother Peter, who died in 1720, also served with distinction in the Russian army.

APRAXIN, STEVEN FEODOROVICH COUNT, (1702–60), a Russian general who served during the Seven Years' War, and gained a fruitless victory over the Prussians at Gross-Jägersdorf in 1757.

APRIL FOOL'S DAY. See APRIL, Vol. II, p. 214.

APRON, a word employed both in military and shipping affairs. The apron of a cannon is a piece of sheet lead which covers the vent. In ship-building the apron is a piece of curved timber fixed just above the foremost end of the keel; its chief use is to fortify the stem and connect it more firmly with the keel. Apron is also the name given to the plank flooring raised, at the entrance of a dock, a little higher than the bottom, to form an abutment against which the gates may shut. It is also a term commonly applied to a half-girdle or garment which covers the front of the person, and is used by workmen and others for purposes of cleanliness.

APSIDES, the two extreme points in the orbit of a planet, one at the greatest, the other at the least, distance from the sun. The term is also applied in the same manner to the two points in the orbit of a satellite, one nearest to, the other farthest from, its primary. A right line connecting these extreme points is called the *line of apsides*. In all the planetary orbits this line has no fixed position in space, but makes a forward motion in the plane of the orbit, except in the case of the planet Venus, where the motion is retrograding. This fact in the orbit of the earth gives rise to the anomalistic year. In the annexed figure, A and B are *apsides*, or points of greatest and least distance of a planet from the sun, the orbit of such planet being an ellipse, with the sun in one of the foci, as at S.



APSIDES.

APSLEY, a branch of the Macleay River, in Vernon County, "New England," about 200 miles N.E. from Sydney, New South Wales, Australia; also a strait between Melville and Bathurst islands, on the north coast of Australia, 48 miles long, and in places 4 miles wide, having a deep channel.

APTERA. In the Linnæan system all wingless insects were classed together. Later entomologists recognize that in some insects the absence of wings is a primitive feature, while in others it is secondary, and due to degeneration. Hence the term *aptera* is not scientific, and is no longer used in improved systems.

APTERYX, a bird. See KIWI, Vol. XIV, p. 104.

APURIMAC, a river of Peru, also called Catango, which drains the western portion of the table-land of Cuzco, and is regarded by some as the principal source of the Amazon; rises in the Andes Mountains, near Lake Titicaca, and, flowing northerly between the departments of Cuzco and Apurimac, unites with the Urubamba to form the Ucayali, and finally joins the Amazon. It gives name to a department of Peru, consisting of five provinces, which has an area of 62,000 square miles. Population 1876, 120,000. The capital, Abancay, is 7,853 feet above sea-level.

AQUA (Lat., water), in its purest state, a compound of oxygen and hydrogen. Sea, river, spring, rain, and distilled water are its chief varieties.

AQUA FORTIS, literally, strong water. It was the term used by alchemists to denote nitric acid, and is still the commercial name of that acid.

AQUAMARINE, a name sometimes popularly given to beryl. Some green and blue varieties of topaz have also been styled aquamarine. See BERYL, Vol. III, p. 613.

AQUA REGINÆ, literally, queen's water. It is a mixture of concentrated sulphuric acid (oil of vitriol) and nitric acid, or of sulphuric acid

and niter. Either mixture evolves much fumes, and may be used as a disinfectant.

AQUA REGIS OR REGIA, the common name applied to a mixture of one part of nitric acid, and two, three or four parts of hydrochloric acid. The general proportion is one to two. The term *aqua regia* was given to the mixture from the power it was said to possess of dissolving gold, which is the "king of the metals."

AQUARIUS, a sign of the zodiac. See ZODIAC, Vol. XXIV, p. 791.

AQUATIC ANIMALS, a term applied to both those animals living entirely in water and to those frequenting water. The great majority of the unicellular animals (*Protozoa*), of the jelly-fishes (*Cœlenterata*), many crustaceans, worms, and mollusks, all echinoderms, and the lowest vertebrates,—all live in water and have aquatic respiration by means of gills. Many worms, crustacea, insects, and mollusks frequent water more or less, but are capable of aerial respiration. Many amphibia, reptiles, birds and mammals spend much of their time in or upon water, but the last three respire entirely by lungs, and most amphibia do so to a great extent. The higher aquatic vertebrates exhibit many wonderful adaptations. Among these are long legs, webbed feet, water-proof plumage, and modifications of the respiratory system which permit long immersion in water. Excepting the insects, there are more aquatic animals, both species and individuals, than terrestrial. Animals in which the aquatic mode of life is primary are generally of a generalized or primitive type of structure.

AQUATINT. See ENGRAVING, Vol. VIII, p. 444.

AQUA TOFANA, a poisonous liquid that gained much notoriety in Italy about the end of the seventeenth century. Its invention is ascribed to a Sicilian woman named Tofana. She sold the preparation in small vials, inscribed "Manna of St. Nicholas of Bari." The poison was especially sought after by young wives who wished to get rid of their husbands. The number of husbands dying suddenly in Rome in 1659 raised suspicion, and a society of young married women was discovered, presided over by an old woman named Spara, who taught the art of poisoning to Tofana. Spara and four other members were publicly executed. Tofana took refuge in a cloister, but at last (1709) was dragged from it and put to torture, when she confessed having been instrumental in causing 600 deaths.

AQUA VITÆ (water of life), a common term applied to ardent spirits. During the alchemical epoch, brandy and distilled spirits were much used as a medicine. It was considered a cure for all disorders, and even got the credit of prolonging life. It was naturally christened Aqua Vitæ.

AQUAVIVA, CLAUDIO, General of the Jesuits, the fifth in succession, and one of the greatest; born Sept. 14, 1543; died, Jan. 31, 1615; elected in 1581, at a time when the commands of Loyola for strict unity and rigid discipline within the order had fallen into disuse, he commenced his work with an endeavor to suppress in its members all individuality and independence. The attempt created enemies, who united in a common opposition to the regulations which he put forth in a book, *Ratio atque Institutio Studiorum Societatis Jesu* (Rome, 1686), but which, with some few changes, remain to-day the scheme of study and rule of education of that order.

AQUEDUCT (literally, a channel or passage to lead or conduct water) has by usage become restricted mainly to the aqueduct bridge, very much as viaduct is restricted in meaning to a bridge over a valley or gorge for highway or railway purposes. In its earlier meaning it was applied to the entire conduit, including the tunnels cut through the rock and the covered channels built beneath the surface, as well as to the conduit carried above the surface on solid walls or on arches, as in the works of the Greeks and Romans, and in some notable examples of this century. In canal-construction, which is recent, as compared to ancient water-supplies for cities, the word has always had the same restricted use as viaduct, meaning simply a bridge by which the canal prism is carried over a stream or valley, and this application has been made to very inferior structures, that were little more than culverts.

The development and application of iron pipe, carrying water under pressure, buried beneath the soil and following the declivities, have done away with massive and monumental structures in masonry in most cases of water-supply for ordinary towns and cities, and even for some large communities. Very extensive pipe-lines are laid, as in the water-supply of Rochester, New York, which are carried over 30 miles, and in those for the cities of New Jersey, opposite New York, which are still longer.

In other places, conduits of masonry are carried through hills or beneath the surface by tunneling, rather than around on the surface or just beneath the same, the valleys being crossed by iron pipe-lines, incorrectly termed inverted siphons. Such conduits are called water-tunnels rather than aqueducts.

TUNNELS. The water-tunnels have had a very extended application in the cities of the lake region, being usually driven in the clay stratum beneath the lake, and lined with brick and cement masonry. They connect with the lake by a vertical iron shaft, usually inclosed in a crib for protection against waves and ice. At the shore end they terminate in a well, from which pumps send the water through the distributing-pipes of a city. Chicago has some twenty miles of such water-tunnels, from five to eight feet in diameter.

In some of the older cities of the country, the system of water-works was originally based on the principles of the old aqueduct, and the term is still continued in its application to later works, though partaking little of the old-style aqueduct, by which water flowed along an artificial channel on a gradient. One of the best examples is the Croton Aqueduct for the supply of New York City. The recent work known as the New Cro-

ton Aqueduct is in reality a water-tunnel beneath the surface, 33¼ miles long and 13 feet 7 inches in diameter.

The conduit for the supply of the city of Washington is also known as an aqueduct, though the recent additions have been by pipe-line, and quite an extended water-tunnel, to be worked under pressure, has been under way for some years. The metropolitan district of which Boston is the center is now entering upon the construction of additional water-works, involving very extensive masonry conduits, but these are not of the old aqueduct type. St. Louis has several miles of conduit, connecting the low service-station at Chain of Rocks with the distributing-station at Bissell's Point.

In hydraulic mining operations, ditches are led for long distances from reservoirs far up the river courses or in the mountains, so as to obtain a working-head of several hundred feet. These have led to some remarkably bold aqueducts of wood carried on timber trestles, often at great heights. These structures are known, however, as flumes.

Some very interesting works in the way of canal aqueducts were built in an early day. Those of the Erie canal at the crossings of the Genesee River, the Seneca River and the Upper and Lower Mohawk aqueducts were notable structures; likewise that at the Fox River crossing of the Illinois and Michigan canal. Some of these structures were arched masonry, while others consisted of a timber trunk carried on masonry piers.

Canal-builders were disposed to avoid aqueducts, except minor structures over the smaller streams that came in at the sides of the valley, and usually crossed the larger watercourses by means of a pool produced by erecting a dam. This also served to feed the canal, and was shut off from the canal by a guard-lock in the flood season.

The modern practice of engineering, with the resources and appliances now available, has made the old style of aqueduct nearly obsolete, and names more pertinent have come to be applied to the different classes of water-conduits. Works are not so monumental, but they are much cheaper, and far safer against accident and malicious mischief. The gravity systems, if adequately carried out, should be as permanent as those of old times. The pumping-systems are, of course, dependent for their maintenance and operation on an annual appropriation bill and efficient management. See AQUEDUCT, Vol. II, pp. 219, 230.

LYMAN E. COOLEY.

AQUEOUS HUMOR. See ANATOMY, Vol. I, p. 889.

AQUEOUS ROCKS, in geology, those portions of the solids composing the layers of the earth's crust, whether existing in compact masses or as incoherent bulk, which have been deposited in a stratified or sedimentary condition by the action of water or ice.

AQUEOUS TISSUE, a term applied to certain groups of cells which serve as reservoirs for water. It is often a modified region of the hypoderma, as in the leaves of certain species of *Polypodium*, *Aspidium*, *Tradescantia*, palms, orchids, etc., in which the cells are thin-walled, without chlorophyll grains, full of watery sap and without intercellular spaces. In many cases of succulent and coriaceous leaves (*Aloe*, *Mesembryanthemum*, etc.), the aqueous tissue is represented by the colorless mesophyll.

AQUIFOLIACEÆ, a family of dicotyledonous plants, of which the common holly (*Ilex aquifolium*) is best known. The order, however, contains three genera and numerous species, the greater part of which are natives of America, and many of them belong to the tropical and subtropical parts of it. They are shrubs or trees with simple leathery (sometimes spiny) leaves, small white clustered flowers, and a four-celled drupe with four stones. Certain South American species contain so much caffein that they are used as a beverage, as the "Paraguay tea" (*Ilex paraguayensis*). The family name is frequently given as *Ilicineæ*.

AQUILA, a constellation situated above Capricornus and Aquarius, supposed to take its name from the eagle of Jupiter. It is on the meridian at 8 p.m. in the middle of September.

AQUILA. See EAGLE, Vol. VII, p. 589.

AQUILARIACEÆ, a family of dicotyledonous plants, all of which are trees with smooth branches and tough bark, natives of the tropical part of Asia. The leaves are entire, the perianth leathery, turbinate or tubular, its limb divided into four or five segments, the stamens usually ten, the filaments inserted into the orifice of the perianth, the ovary two-celled with two ovules, the stigma large, the fruit a two-valved capsule or a drupe. The order is chiefly interesting, as producing the fragrant wood called aloes-wood.

AQUILEJA. See AQUILEIA, Vol. II, p. 230.

ARABIAN ARCHITECTURE. See ARCHITECTURE, Vol. II, pp. 445–448.

ARABIAN GULF. See RED SEA, Vol. XX, p. 316.

ARABIAN LANGUAGE. See SEMITIC LANGUAGES, Vol. XXI, pp. 650–653.

ARABIAN LITERATURE. See ARABIA, Vol. II, pp. 262–264.

ARABIAN NIGHTS' ENTERTAINMENTS. See THOUSAND AND ONE NIGHTS, Vol. XXIII, pp. 316–318.

ARABIAN NUMERALS, the characters 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. See NUMERALS, Vol. XVII, pp. 626, 627.

ARACEÆ OR AROIDEÆ, the technical name of the ARUM FAMILY; q.v., in these Supplements.

ARABI PASHA, AHMED EL HOUSSAIN, Egyptian soldier and revolutionist, chief of the National Party in 1881–82, was born of fellah parentage, in Lower Egypt, in 1837; passed many years in the army without rising to higher rank than lieutenant-colonel; emerged from comparative obscurity when, in 1881, he headed the popular military revolt, by which it was sought to free Egypt

from the tutelage of other nations, and to apportion among her own soldiers and citizens the many lucrative offices of government then in the hands of foreigners. By the bold uprising of September 9th, in that year, he secured an immediate change of ministry, which resulted, early in 1882, in his own elevation to be minister of war, with the rank of pasha; and when the British and French fleets appeared before Alexandria in May, 1882, he was virtually dictator of Egypt. Driven with his army from Alexandria by the British in July, and defeated by them at Tel-el-Kebir in September, he was taken prisoner at Cairo, September 14th, tried for treason in November (but was afterward allowed to plead guilty to the vague charge of rebellion), and was sentenced to death early in December. By previous arrangement the sentence was commuted to perpetual exile, and he was removed to Ceylon.


ARABI PASHA.

ARACAN, a province and city of Burmah. See ARAKAN, Vol. II, pp. 305, 306.

ARACARI, a genus of birds allied to the toucan, found in tropical regions of South America. The plumage is generally green, and often mingled with red and yellow. The feathers on the head of the crested-aracari are beautifully curled.

ARACHNOID MATER OR MEMBRANE. See ANATOMY, Vol. I, p. 865.

ARAD, a county of southern Hungary, west of Transylvania, having an area of 2,490 square miles; mountainous in the eastern portion. The inhabitants are chiefly Rumanian. Population 1881, 303,964.—OLD ARAD, the capital, on the right bank of the Marosch, 150 miles S.E. from Budapest, a fortified town and an important railway center, is the principal cattle market of the kingdom, and has large manufactures of tobacco, with an export trade in grain and wine. Population 1869, 32,700; 1890, 42,100, including many Jews. —NEW ARAD, a town on the left bank of the Marosch, 4 miles S.E. from Old Arad, and at a distance from the river, has a population of 5,600, largely German.

ARADUS, the modern Rouad, was a flourishing city of ancient Phœnicia, in the times of the Seleucides, and is, possibly, referred to in Gen. x, 18. It was destroyed in the seventh century by the Arabs, under Mohaviah.

ARAFURAS, a name applied to certain wild and cruel tribes living in the interior of Celebes, Molucca, and other islands of that vicinity, who are believed by some to be the aborigines of those localities. Others claim that the name has no racial significance, but simply indicates the social condition of certain isolated and hostile populations which have kept aloof from the Mohammedan Malays. Some of them have even lighter skins than the Javanese, while others resemble, in color and aspect, the dark Papuans of New Guinea. The Arafuras of the Ani Islands, says Réclus, claim descent from an ancestral tree, and eat the flesh of dogs, supposing it will keep them always brave and strong.

ARAFURA SEA, an arm of the Indian Ocean, beetween Australia and Papua and the Timur Islands, connecting the Indian Ocean and Torres Strait. It extends from about 120° to 140° E. long., and is from 300 to 400 miles in width. It receives its name from the Arafura tribe, inhabiting some of the islands to the northwest.

ARAGO, CAPE, OR CAPE GREGORY, a point of land in Coos County, Oregon, 4 miles S. of Empire City. On an island joined to the cape by a bridge stands a lighthouse with a flashing light, 75 feet above sea-level, in lat. 43° 20′ 38″ N., long. 140° 22′ 11″ W.

ARAGO, FRANÇOIS VICTOR EMMANUEL, French advocate and Republican politician, eldest son of the great astronomer, born at Paris, June 6, 1812; was called to the bar in 1837, and was successful in many noted causes, usually in the interest of the Radical party. He took an active part in the revolution of 1848, but after the *coup d'état* of Dec. 2, 1852, he left politics and returned to the practice of his profession. After the disaster at Sedan he became an important member of the Government of National Defense; was elected member of the National Assemblies of 1871, 1876, 1882 and 1891, and served the republic as ambassador at Bern. Among his literary works are a volume of poems (1832), and *La Nuit de Noël*, and other vaudevilles (1832–37). He died in Paris, Nov. 27, 1896

ARAGO, ETIENNE VINCENT, French Republican politican and litterateur, brother of the great astronomer, born at Perpignan, Eastern Pyrenees, Feb. 9, 1802; paraded the streets of Paris with the Reds during the "three glorious days" of July, 1830; founded the journals *La Réforme* and *Le Figaro*, and was Director-General des Postes under Cavaignac in 1848, and the originator of cheap postage in France. Being condemned to transportation on account of having participated in the revolution of 1848, he fled the country, but returned in 1859. He was mayor of Paris during the German war, and became archivist to the École des Beaux Arts in 1878; later, conservator of the Museum of Luxembourg. He died in Paris, March 6, 1892. His best literary works are a five-act comedy, produced in 1847, *Les Aristocraties*, in which Republican principles are set forth with flashing wit, and *Les Bleus et les Blancs*, an interesting romance of the war in Vendée. He was also author or collaborator of a vast number of light dramatic pieces.

ARAGO, JACQUES ÉTIENNE VICTOR, French traveler and litterateur, born at Estagel, March 10, 1790; died in Brazil, Jan. 1, 1855; was attached as artist and draughtsman to Freycinet's expedition to circumnavigate the globe in 1817–21, in the course of which he was shipwrecked upon the Falkland Islands, and of which he afterward published an interesting and humorous account;

between 1823 and 1837 he led a literary life at Bordeaux, Toulouse and Rouen, being director of the theater at the latter place, which occupation he relinquished on account of permanent blindness. Between 1825 and 1838 he published a dozen witty dramatic pieces, and edited the ephemeral journals *Le Kaleidoscope*, *La Bombe* and *Qui Vive*. In 1849 he organized a speculative expedition to California which was without satisfactory result. His most noted works are *Promenade Autour du Monde, Pendant les Années 1817–20, sur les Corvettes du Roi, l'Uranie, et la Physicienne, Commandées par M. Freycinet*, with an atlas of 26 plates (Paris, 1822), and *Souvenirs d'un Aveugle: Voyage Autour du Monde* (1820.)

ARAGONITE. See MINERALOGY, Vol. XVI, p. 398.

ARALIA, a genus of dicotyledonous plants of the family *Araliaceæ*. The leaves are usually large and compound, and the small flowers in umbel-like clusters. *A. quinquefolia* is the North American ginseng, not so valuable as the Chinese ginseng, which is a member of the same family; *A. nudicaulis* is used in North America as a substitute for sarsaparilla; while *A. spinosa* is cultivated under the name of "Angelica tree," or "Hercules's club."

ARALIACEÆ, a family of dicotyledonous plants found in almost all parts of the world, in many respects resembling umbellifers, from which they differ in their ovary, having more than two cells, and by their more shrubby habit. The family is most largely represented in warm countries. Aside from the species of the typical genus, *Aralia*, (which see,) well-known species are *Hedera Helix* (the common ivy), *Panax Schinseng* (the Chinese ginseng), and *Fatsia papyrifera* (the source of the true Chinese rice-paper).

ARAMÆA (from the Hebrew word *Aram*, signifying the highland, in opposition to the lowland, of Canaan) includes the whole of the country situated to the northeast of Palestine. Its boundries, though not rigorously defined, were as follows: North, by Mount Taurus; east, by the Tigris; south, by Arabia; and west, by Arabia, Phœnicia and Lebanon. It embraced the countries known to the Greeks by the various names of Syria, Babylonia and Mesopotamia.

ARAMIDÆ, a family of birds completely intermediate between the cranes and rails. There is only one genus (*Aramus*) which is tropical—American in distribution. They are often known as limpkins or courlans.

ARANEIDEA, or spider family. See ARACHNIDA, Vol. II, pp. 290, 299.

ARANSAS, a bay and river in Texas. The river rises in Bee County, in the southwest of the state, separates Refugio and San Patricio counties; empties into a large western arm of the bay called Copano Bay. Aransas Bay lies behind St. Joseph's Island, and is a northeasterly extension of Corpus Christi Bay. It is 18 miles long and about 8 miles wide. An inlet from the Gulf of Mexico at the southern end of the island is called Aransas Pass, a name also given to a town on the main shore of San Patricio County opposite the inlet, and having a population of about 1,100. The town is on a railroad connecting Rockport, 12 miles to the N.E., on the bay shore, with San Antonio.

ARANY, JÁNOS, next to Petöfi the most distinguished of modern Hungarian poets, born at Nagy-Szalonta, March 7, 1817; died in Budapest, Oct. 22, 1882. When the Kisfaludy Society of Pesth offered a prize, in 1843, for the best humorous poem, Arany sent in anonymously his humorous *Az elveszett Alkotmany* (The Lost Constitution of the Past). He was successful, and soon became a popular favorite. In 1848 appeared his *Murany Ostroma* (Conquest of Murany), and in 1874 his *Buda Haldla* received special honor from the Hungarian Academy.

ARAPAHOE OR ARRAPAHOE, a tribe of the Algonquin family of North American Indians, numbering about 5,000, and now located by the United States government partly in Wyoming and partly in Oklahoma, but formerly living on the plains between the Platte and Arkansas rivers. They were a bold and predatory race, cultivating alliance with the Sioux and Cheyennes, but warring constantly with the Utes. They were often a terror to settlers on the frontier.

ARAPAIMA, a genus of fishes found in the rivers of South America, and said to be the largest fresh-water fish. It reaches a length of 10 to 12 feet, and a weight of 300 pounds. As a food-fish it is of great economic value.

ARAPILES, a village of Spain, located upon heights four miles S.E. of Salamanca, the scene of the battle of Salamanca, July 22, 1812, in which the French, under Marmont, were defeated by Wellington. Population, 400.

ARASH, a Persian measure of length, equivalent to 38.27 inches.

ARAUCANIA. The Chilian province of Arauco, or country of the Araucos Indians, lying between the Andes and the Pacific Ocean, and bounded on the north by Concepcion, south by Valdivia, was formed in 1875, and has an area of 81,000 square miles and a population of 100,000. The Araucanians are interesting, as furnishing the only example of Indian self-government in the presence of European races. They are a fierce and warlike people, and have a kind of military-aristocratic constitution, without any formal laws. From the days of Pizarro downward, Araucania has uniformly vindicated its freedom, its wars of independence having lasted, with intervals of precarious truce, from 1537 to 1773. In 1861 a French adventurer, Tonneins by name, was elected king of Araucania as Orélie Antoine I. He was soon at war with Chile, but was captured and allowed to go to France, and after a vain attempt to recover his kingdom, 1869–70, died in France, 1878.

ARAUJO D'AZEVEDO, ANTONIO, afterwards CONDE DE BARCA, Portuguese diplomatist; born at Ponte de Lima, May 14, 1754; died at Rio Janeiro, June 21, 1817. He was an accomplished man of letters and science, devoted to efforts for

the internal improvement of his country. He founded an Economical Society of Friends of the Public Good; became an early member of the Royal Academy of Sciences at Lisbon; joined in a project to render the river Lima navigable, and in another to aid the silk industry by the extensive planting of mulberry trees, besides introducing some textile manufactures into Portugal; appointed ambassador to the Hague in 1787; in 1797 he negotiated a treaty with France, which was afterward annulled, through pique at delay on the part of the Lisbon government in its ratification; in 1802 he was named Portuguese minister at St. Petersburg, and in 1803 became secretary of state in the cabinet at Lisbon. In 1808, after the capture of Lisbon by the French, he accompanied the king to Brazil, where he established botanic gardens, a school of chemistry, a printing-press and other civilizing institutions. He became minister of marine and the colonies in 1814, prime minister in 1817, and was created Count of Barca in 1815. Among his literary works are Portuguese translations of Horace's *Odes*, Gray's *Elegy*, and Dryden's *Saint Cecilia's Day*.

ARAUJO PORTO-ALEGRE, Manoel de, Brazilian artist and poet; born in Rio Pardo, Nov. 29, 1806; studied painting and architecture, first at Rio Janeiro, then at Paris, and afterward visited Italy. In 1835 he became professor at the art school, and afterward drawing teacher in the military school at Rio. Was Brazilian consul-general at Stettin, 1859–66, but resided chiefly at Berlin; wrote *Colombo*, an unfinished epic poem; *Brazilianas*, a series of patriotic lyric poems. He died Dec. 30, 1879, in Lisbon.

ARAURE, a town of Venezuela, South America, situated in lat. 9° 17′ N., long. 69° 28′ W., 60 miles E.N.E. of Trujillo, in a region noted for its fertility in the production of cotton, coffee, cattle, etc. Population, 10,000.

ARBITRATION is the act of determining, by persons appointed to decide a matter in controversy, on a reference made to them for that purpose, either by agreement of the parties in dispute or by the order of a court of law. Though a somewhat inconsistent term, *Compulsory* Arbitration is used to define the obligation, created by law, to adopt this mode of settlement for certain disputes, especially those arising between workmen and employers in strikes, lockouts and controversies on wages. The character of recent labor troubles in the United States, and notably the disturbances at Homestead, Pennsylvania, and the railroad strike of 1894, have excited a strong feeling in favor of such law, advocated warmly by Dr. Lyman Abbott and others, though its operation would undoubtedly be strewn with difficulties. Some valuable recommendations and a very ample discussion of the whole subject will be found in the *Report of the Railroad Strike Commission*, which, under the able presidency of the Hon. Carroll D. Wright, investigated the causes and effects of this greatest of labor troubles. His valuable conclusions on this subject will be found over his own signature in the article on Labor Organizations; q.v., in these Supplements. See Vol. II, p. 311.

ARBOIS DE JUBAINVILLE, Marie Henri d', French archivist, member of the Institute, and recipient of the cross of the Legion of Honor; born at Nancy, Dec. 5, 1827; studied, 1848–51, at the École des Chartes, and from 1852 to 1880 was archivist of the department of the Aube, and member of the Society of Agriculture, Commerce and Belles Lettres, and since 1882 the first incumbent of the chair of Celtic language and literature in the College of France. He was the author of many learned works, among which are *Introduction to the Study of Celtic Literature* (1882) and *Essay for a Catalogue of Irish Epic Literature, etc.* (1883).

ARBOLEDA, Julio, poet, orator, soldier and statesman of New Granada, born at Timbiqui, July 9, 1817; was educated in England, France and Italy, and upon returning to New Granada in 1838 took a course in law and politics at the University of Cauca. In 1839 he began his public life as editor of *El Patriota*, and later of *El Independente;* from that time on he took an active part in the troubles of his country, always on the conservative side of law and order, and holding many high military and political offices. While imprisoned by his enemies in 1851 he wrote two sublime poems of patriotic inspiration, *Estoy en Carcel* and *Al Congreso Granadino*, breathing a fervor which gained him the title "Giant of the Andes." In 1853 he visited New York, and from 1855 he commanded the army of the constitutional party of New Granada and defeated the revolutionists in a number of engagements. He was assassinated Nov. 12, 1862, in the pass of Berruecos and his death made possible the success of the revolutionists and the establishment of the United States of Colombia.

ARBOR DAY. What is known as "Arbor Day" in the United States is a day especially set apart for the planting of trees and shrubs by school children and others. In many cases whole districts have been completely transformed by these efforts, and the interest is yearly increasing. In Canada the first Friday in May has been constituted "Arbor Day" for the whole Dominion, but in the United States, owing to the wide range of climate and the consequent difference in the seasons, various days are named in the different states and territories.

ARBOR-VITÆ. See Anatomy, Vol. I, p. 872.

ARBROATH FLAGS. See Geology, Vol. X, pp. 343, 344.

ARBUTUS, a genus of dicotyledonous plants of the family *Ericaceæ*. They are evergreen shrubs, and occur in North America and southern Europe. *A. Unedo* is the "strawberry tree," with red and yellow berries; *A. Menziesii* is the "madroño" of the Pacific Slope, while "manzanita" and "bearberry," formerly included in this genus, are now placed in a closely allied genus, *Arctostaphylos*. The "trailing arbutus," or "Mayflower," is *Epigæa repens*, another genus of the same family.

ARC (Lat. *arcus*, a bow), any part of a curved line. The straight line joining the ends of an arc is its *chord*, which is always less than the arc itself. Arcs of circles are *similar* when they subtend equal angles at the centers of their respective circles; and if similar arcs belong to equal circles, the arcs themselves are equal.

ARCA, or ARK-SHELL, a genus of bivalve shells and lamellibranch mollusks, the type of the family called *Arcidæ*. In the true *Arca* the hinge is straight, and occupies what at first seems the whole length of the shell, but is in reality its whole breadth, the breadth being greater than the length.

ARCACHON, a bathing-place which has grown into importance since 1854, situated on the south side of the Bassin d'Arcachon, 34 miles S.W. of Bordeaux. It has fine broad sands, and the place is sheltered by sand-hills, covered with extensive pine woods, in which game abounds. Arcachon is much frequented in winter by persons with weak lungs. Scientific oyster-culture is practiced here on a large scale. Population, 7,087.

ARCADIUS, first emperor of the East (395–403, A.D.); born in Spain, A.D. 373; died A.D. 403. His dominion extended from the Adriatic Sea to the river Tigris, and from Scythia to Ethiopia. Afterward Eudoxia, the wife of the emperor, assumed the supremacy. One really great man adorned this period, Chrysostom, who was persecuted by Eudoxia.

ARCANI DISCIPLINA, a doctrinal term, first used late in the sixteenth century, and meaning "instruction in the mystery." It denotes a practice of the early Church in the third, fourth, and fifth centuries, by which the privilege of being present at, or of receiving instruction concerning, the sacraments of baptism and the eucharist (and also the rites of confirmation, etc.) was withheld from all persons, whether catechumens or unbelievers, who had not been admitted to full membership. The practice is said to have been founded on the words of our Saviour, "Give not that which is holy unto the dogs": Matt. vii, 6; and in the spirit of the texts, 1 Cor. iii, 12, and Heb. v, 12–14.

ARCANUM. In the middle ages, the Latin word *arcanum* ("secret") was used of any of the most valued preparations of alchemy, but the title was especially applied, as above, to the highest problems of the science—the discovery of such supposed great secrets of nature as the grand elixir.

ARCANUM, a village of Darke County, west-central Ohio; situated at the crossing of the "Big Four" and Dayton and Union railroads, and in the midst of a fertile tobacco region. Population 1890, 1,134.

ARCÉ, MANOEL JOSÉ, a Central American soldier and statesman, first conspicuous in the rebellion of 1811; became, in August, 1825, after the organization of the United States of Central America, the first constitutional president of that republic. His administration was short and turbulent, and he abandoned the office without formal resignation, Feb. 14, 1828. In 1830 he published a defense of his course, entitled *Memoria de la conducta publica y administrativa de Manoel José Arcé durante el periodo de su presidenceia.*

ARCH, JOSEPH, labor reformer, born at Barford, Warwickshire, England, Nov. 10, 1826; was originally a farm-laborer. He educated himself by laborious night study, and became a primitive Methodist preacher. In 1872 he "began the emancipation of the rural laborers of England," by founding the National Agricultural Laborers' Union, of which he became president, and in whose interest he visited Canada. In 1885, and again in 1892, he was elected to represent the northwest division of Norfolk in the English Parliament. His career is related by E. G. Heath, in *The English Peasantry* (1874).

ARCHÆAN PERIOD. See GEOLOGY, Vol. X, pp. 327, 328.

ARCHÆOLOGY, "the science which deduces the history of man from the relics of the past." See article in Vol. II, pp. 333–368, treating of prehistoric and classical archæology. The former of these divisions reaches down to the era of authentic history, while the latter investigates the results of artistic activity among the Greeks and Romans. It remains to give some account of the archæological researches in progress at the present time.

In the United States much attention is being given by universities, learned societies and individuals to the remains of the prehistoric races of America,—notably to the structures of the mound-builders, the strange pueblos in Arizona and New Mexico, the customs and relics of the Zuñi Indians, and the ruined temples of Old Mexico and Yucatan. Liberal contributions of money and personal effort have, at the same time, been given to the several funds and societies engaged in the archæological explorations of Greece, Egypt, Palestine and Mesopotamia, not only in the United States, but also in Great Britain, France, Germany and other nations.

Researches in the department of classical archæology prosecuted in Greece by the American School of Classical Studies at Athens have resulted in the discovery, at Argos, near Mycenæ, of the substructure of the Heræum, or Temple of Juno, from which, in connection with fragments of other portions of the building, a satisfactory idea of its construction and architectural features may be obtained; and at Argos a marble building has been found which is believed to have been the gymnasium. The British School at Athens has recently made excavations at Abæ, in Phocis, but without important results. The work of the French School at Delphi has disclosed a building called the "treasury of the Athenians," which, it is believed, was erected to commemorate the battle of Marathon, and which bears on its inner wall an interesting inscription of a hymn, with the music noted over the words. The German school, by the labors of Dr. Dörpfel, has made discoveries at Athens which modify current ideas of the geography of that city. At Corinth labor has been rewarded by the discovery of a house of the Hel-

lenic period concealed beneath a structure of Byzantine date. It is also claimed that the veritable ruins of ancient Troy have been discovered, near, but not identical with, the six successive cities uncovered by Dr. Schliemann on the historic site. In Egypt a Greek inscription cut in the leg of one of the colossal statues which guard the entrance to the Greek temple at Abu-Simbel, has been found which dates back to 600 B.C., and which records an exploration of the Nile as far up as the second cataract. At Dashur many interesting articles of gold, precious stones, etc., have been found, and in the necropolis of Akhmin lamps with the Christian monogram, and inscribed, "In the name of the Father, and of the Son, and of the Holy Spirit," together with other mementos of early Christians which probably date back to the fourth century, have been exhumed.

In Jerusalem an ancient gate has been found which is clearly a part of the earliest wall, and another gate called the "Lepers' " the situation of which was defined in the twelfth century in terms which give a clue to the location of the Holy Sepulcher. The discovery made by Mrs. Lewis in the convent on Mount Sinai, in 1892, of an early Syriac manuscript of the Gospels, is already well known to the civilized world.

The union or congress of British archæological societies, which was formed in 1888, has produced good results in directing and systematizing the work in the British Islands; and among the improvements instituted are a photographic survey of England by counties, intended to preserve accurate records of every object of archæological and scientific interest in the kingdom, and an archæological survey of Britain, which will show upon an accurate map of each county the location of all archæological *finds*, and the establishment, under various names, of societies for the preservation of ancient landmarks and interesting localities.

For detailed information on recent explorations in Assyria by Hilprecht, see NIPPUR, in these Supplements; also the following works: Baldwin's *Ancient America; Antiquities of the Southern Indians;* Foster's *Prehistoric Races of the United States;* Brinton's *Myths;* the *Iconographic Encyclopædia;* and the reference given at the beginning of this article.

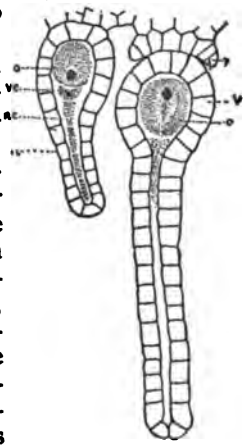
ARCHÆOLOGICAL INSTITUTE OF AMERICA, THE, was organized in Boston in 1879, with Charles Eliot Norton as president, and has made much progress in archæological research in classic lands as well as in America, notably in Asia Minor, at Assos, where its first explorations were made; at Babylonia,—the expenses of the expedition under Dr. Ward being defrayed by Miss Catherine Lorillard Wolfe, of New York; and in Mexico. The American School of Classical Studies at Athens was established by this society.

ARCHÆOPTERIX, a fossil bird. See BIRDS, Vol. III, pp. 728, 729.

ARCHBALD, a borough of Lackawanna County, northeastern Pennsylvania, on the Delaware and Hudson railroad, 11 miles N.E. of Scranton. The prosperity of the village is due to rich mines of anthracite coal which are worked in the vicinity. The iron trade is also extensively carried on. Population 1890, 4,032.

ARCHDALE, JOHN, came to New England in 1664, and in 1695 was made governor of North Carolina. He was a sagacious and prudent chieftain, and under his administration the province made great progress. He published *A New Description of the Fertile and Pleasant Province of Carolina, with a Brief Account of its Discovery, Settling, and Government up to this Time, with Several Remarkable Passages During My Time* (1707).

ARCHEGONIUM, the female organ of bryophytes, pteridophytes and gymnosperms, although usually restricted to the two first-named groups, which are often spoken of, in consequence, as archegoniates. The organ is very uniform in origin and structure, being multicellular and flask-shaped, with a longer or shorter neck, and either free or more or less imbedded in the tissues of the plant. It develops an axial row of cells, the lowest of which is the oösphere, or female gamete, while the others become disorganized and are discharged at maturity from the open canal thus developed. Through this neck-canal the spermatozoid, or male gamete, makes its way to the oösphere. This organ is represented by the oögonium in thallophytes, but holds no morphological relation to the "pistil" of flowering plants, as is often stated. See BOTANY, Vol. IV, pp. 157, 158; and MORPHOLOGY, in these Supplements.



Archegonia of *Marchantia polymorpha*, showing: *o*, Oösphere; *vc*, Ventral canal-cell; *nc*, Neck canal-cells; *n*, Neck; *v*, Venter. (Original.)

ARCHEGOSAURUS, a remarkable fossil saurian reptile, found in the coal-measures of Münster-Appel, in Rhenish Bavaria, and supposed by Meyer to be related to the salamanders, although he says "its head might be that of a fish, as well as that of a lizard." There are several species, and Sir Richard Owen regarded them as a link between fishes and reptiles.

ARCHENCEPHALA, a name applied to the highest division of the class *Mammalia*. The group is based upon the preponderant cerebrum, and embraces man.

ARCHER, BRANCH T., Texan revolutionist; born in Virginia in 1790; died in Brazoria County, Texas, Sept. 22, 1856. For many years he was a practicing physician in his native state, and several times a member of the legislature. He removed to Texas in 1831; became active in the movements preliminary to the revolution; was a member of the first Texan congress, and later went to Washington, where he became speaker of the House of Representatives, and Secretary of War from 1839 to 1842.

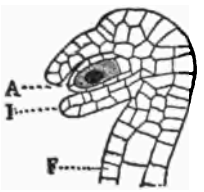
ARCHER, JAMES, a Scotch painter; born in Edinburgh, June 10, 1824; removed to London in 1862; exhibited the following, among other pictures: *The Last Supper; The Mystic Sword Excalibur* (one of a series from Tennyson's *Morte d'Arthur*); *Peter the Hermit Preaching the First Crusade; St. Agnes, a Christian Martyr.* In 1884 he visited the United States and painted portraits of James G. Blaine and Andrew Carnegie.

ARCHER, JOHN, an American statesman and physician, was born in Maryland, June 6, 1741. He made many improvements in medicine; was conspicuous for patriotism during the Revolution, and was for some time a member of Congress. He died in 1810.—STEVENSON ARCHER, his son, who died in Maryland in 1848, was a noted jurist, and chief justice of his native state at the time of his death. He was thrice a member of Congress, and for two years a United States territorial judge in Mississippi.

ARCHER, WILLIAM, author, journalist and dramatic critic, was born in Perth, Scotland, in 1856. He was called to the bar at the Middle Temple, London, 1883. His translations have made Ibsen's and other Norwegian plays familiar to the English public.

ARCHER-FISH, a name given to certain small East Indian fishes which are said to have the power of projecting drops of water with sure aim at insects, thereby causing them to fall into the water, where they are instantly seized as prey.

ARCHESPORIUM, a name used in connection with the development of a multicellular sporangium, and appled to the cell or group of cells, early differentiated, from which the "mother-cells" of the spores are developed. In other words, the archesporium represents, in the developing sporangia, the differentiated group of sporogenous cells, as distinct from the sterile tissues. In its development the archesporium becomes more or less invested and distinctly set apart from the surrounding tissue by a layer of cells known as the tapetum. In structure and form the archesporium varies in different groups of plants, and has been extensively used in comparative morphology. It may be a solid mass of cells (most liverworts), or a layer (most mosses), or a row (lycopods), or a single cell (certain ferns, Equisetums and ovules of the seed-plants).



Young ovule of *Calopogon*, showing the archesporium: *A*, shaded; *I*, integument; *F*, funiculus. (Original.)

ARCHETYPE, in philosophy, the synonym of *idea;* in ordinary matters, a primitive standard or pattern to which similar productions must conform. See SCHOLASTICISM, Vol. XXI, pp. 424, 427.

ARCHIAS, AULUS LICINIUS, Grecian poet; born at Antioch; became a Roman citizen; was a friend of Cicero. He died about 40 B.C.

ARCHIATER, derivatively, a chief surgeon; often used of the court surgeon.

ARCHIBALD, SIR ADAMS GEORGE, Canadian jurist, born in Truro, Nova Scotia, May 3, 1814. He was educated at Pictou Academy, and admitted to the bar in 1838. He was a member of the executive council of Nova Scotia from 1856 to 1863; was sworn of the privy council in 1867; was secretary of state for the provinces; 1867–68; and lieutenant-governor of Manitoba and the northern territories, 1870–73. He was a judge in equity in 1873, and the same year was appointed lieutenant-governor of Nova Scotia. He served in that capacity for two terms. He was president of the Nova Scotia Historical Society, and a member of the House of Commons of the Dominion. He died Dec. 14, 1892.

ARCHIBALD, ANDREW WEBSTER, Congregational minister; born April 10, 1851; graduated at Union College, New York, 1872. Settled in Iowa, and since 1888 has been trustee of Iowa College. Author of *The Bible Verified.* (1890).

ARCHICARP, a name applied to the female organ of certain fungi, in which no distinct gamete is differentiated, the undifferentiated cell-contents being fertilized. The archicarp may be unicellular or multicellular. The name is used in distinction from the *oögonium*, in which the female gamete (*oösphere*) is distinctly organized. The *procarp* is a similar organ among the red algæ.

ARCHIDAMUS, the name of five Spartan kings. The second of the name invaded Attica during the Peloponnesian war, and died 429 B.C.; the third of the name defended Sparta against Epaminondas, 362 B.C., and assisted the Phocians in the third sacred war, 356–346 B.C.

ARCHIMAGUS, a title designating the chief of the Magi, assumed by Darius I, after the massacre of that body.

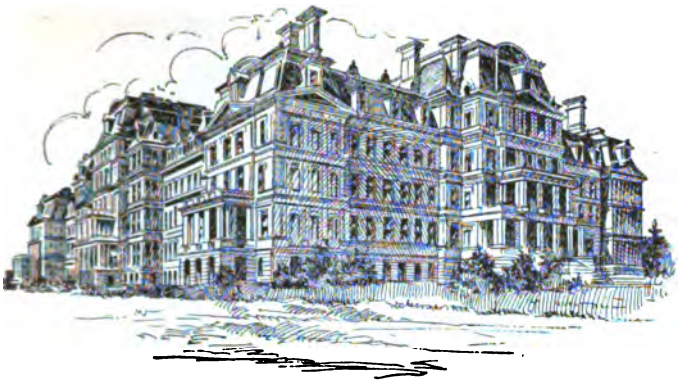
ARCHIMANDRITE (Gr. *archi*, "chief;" *mandra*, "a fold," or "a convent"), the title of the highest order of superiors of convents in the Greek Church.

ARCHIMEDES, PRINCIPLE OF. See HYDROMECHANICS, Vol. XII, p. 441.

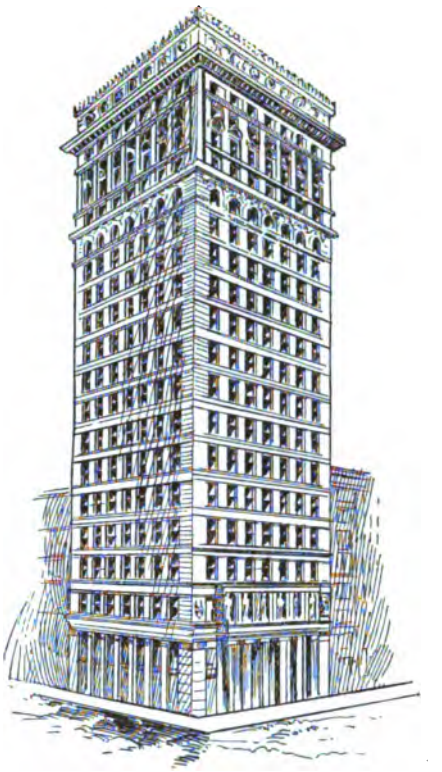
ARCHINE. See ARSHIN, in these Supplements.

*ARCHITECTURE, AMERICAN. Under the elaborate and greatly extended article in BRITANNICA, Vol. II, pp. 382–475, will be found some account of the architecture of the pre-Columbian races who inhabited this continent, and whose only remains at the present day consist of more or less curious, and often almost cyclopean structures. The nomadic American Indians, or red men, build no permanent structures, and it is thought that the tumuli or mounds found throughout the Ohio and Mississippi valleys were the work of an extinct race, styled, for want of a better name, the "Mound-builders." With the advent of European colonists there arose, of course, a style of domestic architecture founded on the styles common in the various mother-countries, modified by the conditions and necessities of life in an often rigorous climate. Thus arose the style of domestic architecture in the Eastern states known as the Colonial,—a style marked by considerations of comfort rather than by attempts at magnificence, though in a few instances of the latter the architect or designer indulged in massive

*Copyright, 1896, by The Werner Company.



**STATE, WAR AND NAVY DEPARTMENT BUILDING**
WASHINGTON, D. C.



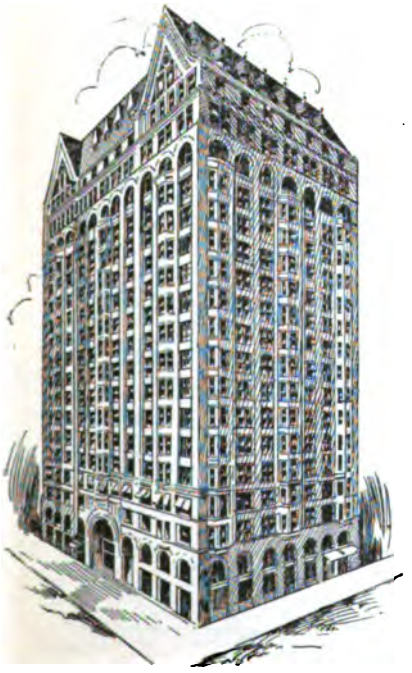
**AMERICAN SURETY CO'S OFFICE BUILDING**
NEW YORK CITY, 1892



**AUDITORIUM BUILDING AS SEEN FROM LAKE FRONT PARK**
CHICAGO, 1888



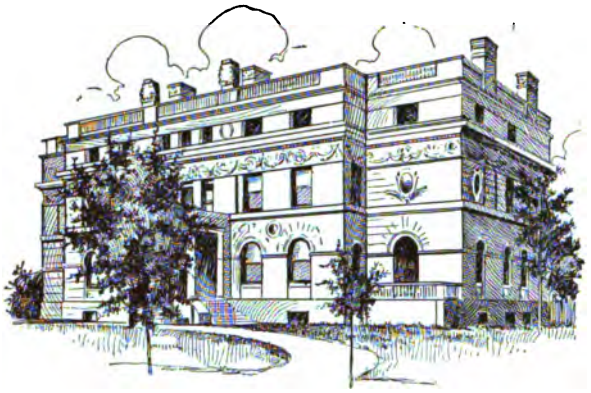
**HOTEL PONCE-DE-LEON**
ST. AUGUSTINE, FLA., 1886



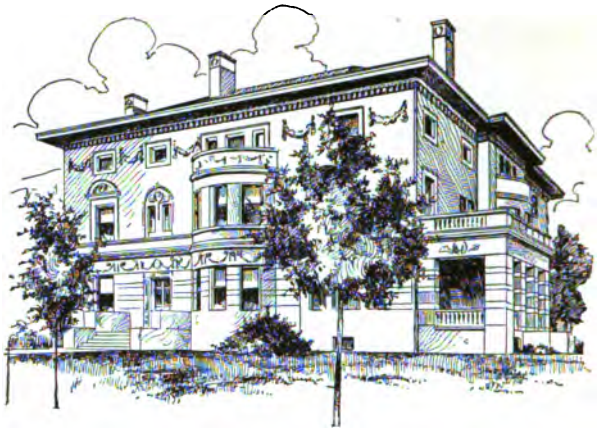
**MASONIC TEMPLE OFFICE BUILDING**
CHICAGO, 1890



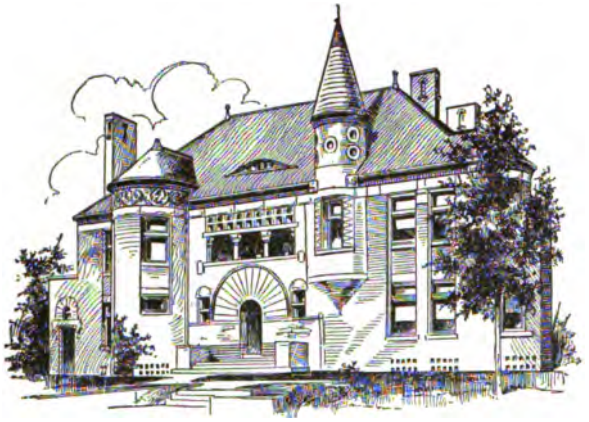
**THE TREASURY BUILDING**
WASHINGTON, D C



RESIDENCE ON PORTLAND PLACE
St. Louis, 1894



RESIDENCE ON PORTLAND PLACE
St. Louis, 1894.



RESIDENCE
St. Joseph, Mo. 1892



NEWBERRY LIBRARY
Chicago, 1891

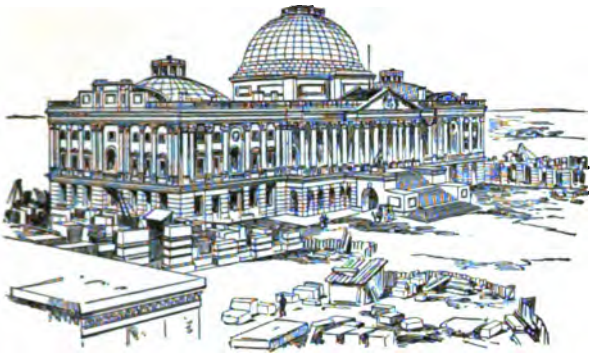


HOTEL WALDORF
New York, 1892



BY J. W. ROOT, DEC'D

THE ROOKERY
Chicago, 1886



CAPITOL AT WASHINGTON, AS FINISHED BY BULLFINCH, FROM THORNTON'S AND LATROBE'S DESIGNS IN 1830, WITH COMMENCEMENT OF WINGS BY WALTER IN 1851



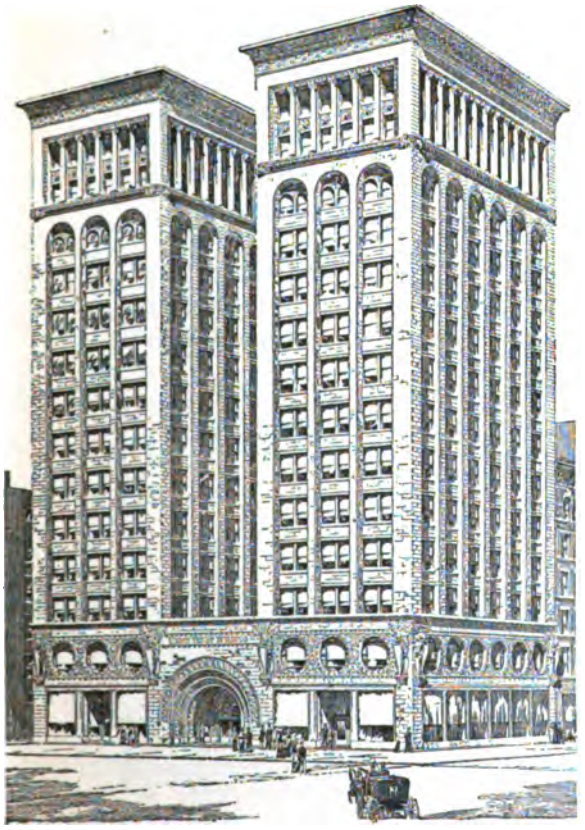
EXCHANGE BUILDING, KANSAS CITY, 1886, BY J. W. ROOT, DEC'D



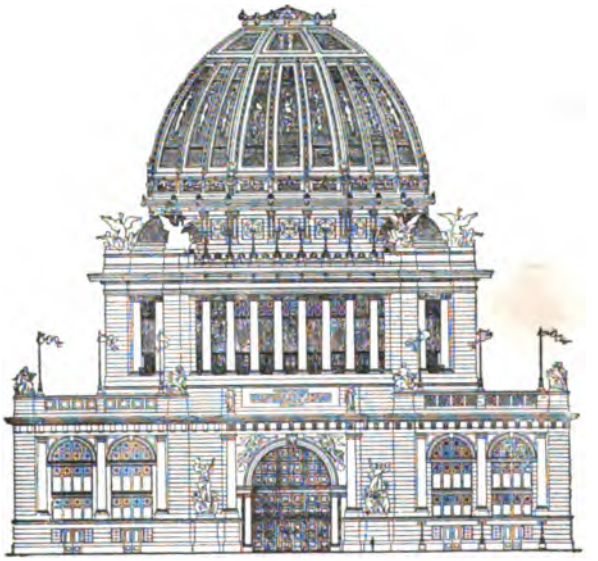
TRINITY CHURCH, BOSTON, BY THE LATE H. H. RICHARDSON, 1875



MILLS BUILDING, SAN FRANCISCO, 1891, BY J. W. ROOT, DEC'D — STEEL SKELETON CONSTRUCTION



UNION TRUST COMPANY'S BUILDING, ST. LOUIS, MO., 1892, BY LOUIS J. SULLIVAN — STEEL SKELETON CONSTRUCTION



ELEVATION OF ADMINISTRATION BUILDING, WORLD'S COLUMBIAN EXPOSITION, CHICAGO, 1893, BY R. M. HUNT, DEC'D



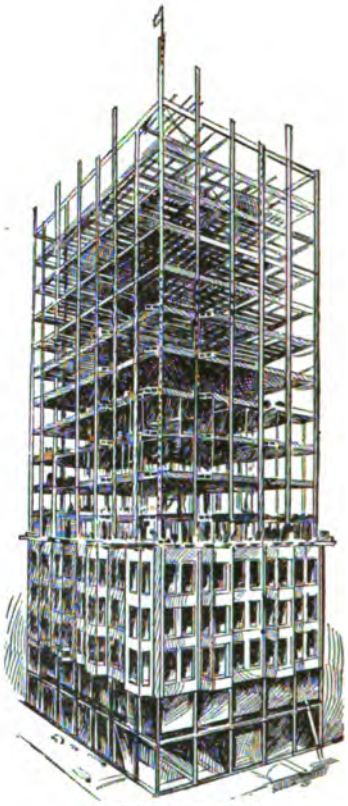
SCHILLER BUILDING
STEEL SKELETON CONSTRUCTION
CHICAGO, 1892



UNITED STATES CUSTOM HOUSE AND POSTOFFICE
CHICAGO, BY H. I. COBB, 1896



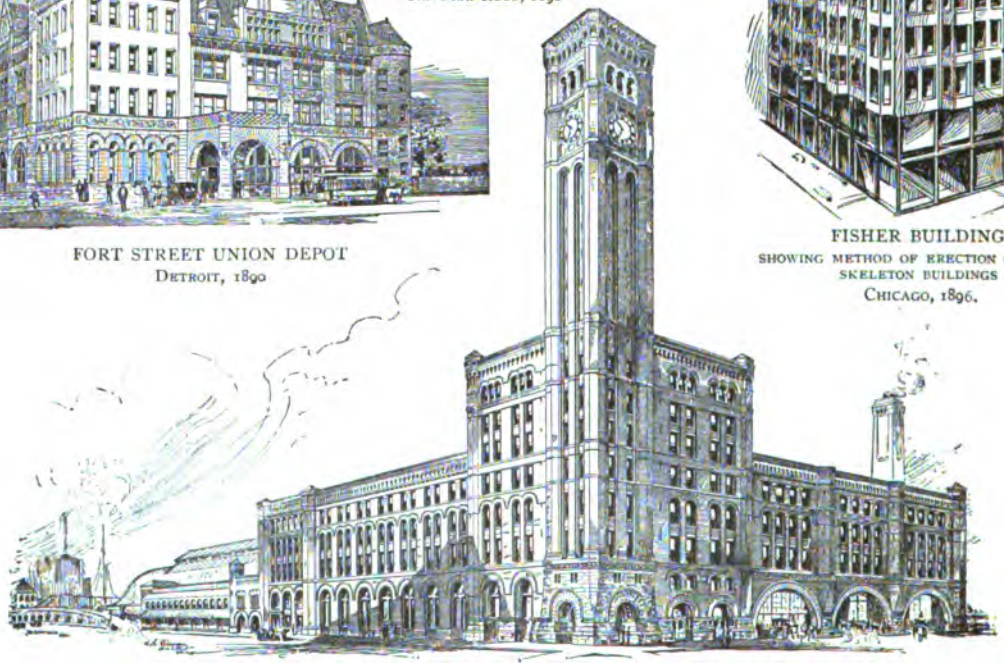
CHRONICLE BUILDING
STEEL SKELETON CONSTRUCTION
SAN FRANCISCO, 1890



FISHER BUILDING
SHOWING METHOD OF ERECTION OF STEEL SKELETON BUILDINGS
CHICAGO, 1896.



FORT STREET UNION DEPOT
DETROIT, 1890



GRAND CENTRAL PASSENGER STATION
CHICAGO, 1889

porticos guarded by Ionic, Doric or Corinthian columns of wood. For the first half century of the existence of the United States as a nation, but little originality was shown by native architects, if such a school could be said to exist. Designers were content to copy European models, whether for religious, municipal or domestic purposes. These models were the contemporaneous buildings of England under the Georges. The great work of Stewart and Revett on the antiquities of Athens had aroused an enthusiasm for Greek architecture, which for a time diverted the minds of English architects from the example of Sir William Chambers, then regarded as the highest authority on Palladian or Italian Renaissance. The so-called Greek revival in England had its imitators in America, but the imitations were crude copies, not of Greek architecture, but of the works of those who had not shown their ability to interpret it in forms adapted to modern usages. So that wherever a building was erected that was supposed to require architectural expression, its details were mere travesties upon the architecture of the Greeks. Wherever there seemed to be no call for this the work was all done by builders who copied details for woodwork from English books. Among the latter were the works of the Adams brothers, which appeared in the latter part of the eighteenth century, from which much of the attenuated and often refined and graceful ornamentation, now called Colonial, was derived. The wooden details of our American houses seem to have been more refined. than those of the same period as used in England, so that they have lately become objects of interest with our architects, and are being copied and reproduced extensively.

There were no public buildings in America before the Revolutionary War of greater architectural interest than Faneuil Hall at Boston and Independence Hall at Philadelphia, both still standing, and a few churches like the Old South in Boston, St. Paul's in New York, and a few more in Baltimore, Philadelphia, Norfolk and Charleston. Some of the latter were copied from the designs of Sir Christopher Wren, with modifications.

THE CAPITOL AT WASHINGTON. It was not until it became necessary to erect a new capitol and President's house at Washington in 1791 that architectural history may be said to have commenced. The Capitol was commenced in 1793 and never finally completed until 1865, though there were several long periods during which no work was done upon it. One was on account of everything combustible in it having been destroyed by the British army in 1814, and the other was the period from 1830, when it was completed in its original form, to 1851, when it commenced to receive its present form at the hands of Thomas U. Walter. The President's house was commenced at the same time. This was designed by Stephen Hallet, a French architect residing in the United States. Washington was then President. The Capitol now bears no resemblance to the original design, as it passed through the hands of a number of architects and superintendents, and was originally not quite one third of its present size. A very detailed history of its designing and erection appeared (1896) in the current number of the *American Architect and Building News*, from the pen of Glenn Brown. (See also article by James Q. Howard, in the *International Review* for November, 1874, and a paper on "Government Architecture and Government Architects," *American Architect and Building News*, March 4, 11 and 18, 1876, by P. B. Wight.) The building was partially completed and occupied, but it was burned Aug. 14, 1814, when the British army captured Washington. After the war, Benjamin H. Latrobe practically rebuilt it and modified the design, but in 1817 he was obliged to resign on account of the appointment of a commissioner, to whose dictation he would not submit. He was succeeded by Charles Bullfinch, an eminent architect of Boston, who also built the State House in Boston and many other prominent buildings in the New England states. Bullfinch continued in charge until 1830, when the building was completed according to the design of Latrobe. The building was then a center pavilion with low dome and two short wings. In one wing was the House of Representatives, and in the other the Senate chamber—now the Supreme Court room. There was a low dome over each of these apartments. Nothing further was done to the Capitol until 1851, when the designs of Thomas U. Walter were adopted for two additional wings, each of which was about the size of the original building. These were built of white marble from Lee, Massachusetts, the main building being of red Potomac sandstone. But the sandstone had meanwhile been painted white and has been so kept ever since. Before the wings were completed Mr. Walter made a new design for the dome, which nearly covers the central building. It is built of cast iron and painted white to match the stonework. The whole work was finally completed in 1865, at the close of the war.

GOVERNMENTAL ARCHITECTURE. The title of "Surveyor of Public Buildings" was given to James Hoban, superintendent of the Capitol, in 1794, which office he held for twenty-five years. The same title was conferred upon Benjamin H. Latrobe when he succeeded Hoban and became the architect of the Capitol. After Latrobe retired, a government "Commissioner of Public Buildings" was appointed. But no such office existed after 1830. The government buildings erected during the first part of the century in Washington and various parts of the country were conducted, somewhat as the capitol was, under the direction of Cabinet officers or Congressional commissions. These buildings comprised a few of the department offices and custom-houses, subtreasuries, the mints and a building in Philadelphia for the United States Bank. The latter went out of use with the abolishment of the bank. Among these are the Interior Department, the Treasury Department, the Post-Office Department at Washington, the Mint at Philadelphia and the Sub-Treasury at New York.

It was about the year 1850 that something approaching a system came into use. The public buildings were then erected under the direction of the War Department, and an office was established under the charge of a major of United States

engineers. The plans were made under his direction by architects who simply acted in the capacity of draughtsmen at so much *per diem*. An officer of engineers was assigned to each building as "Engineer in Charge." Mr. Walter, while architect of the Capitol extension, working for a salary of $5,000 a year, had been charged with making plans for additions also to the Interior Department Building (Patent-Office) and the Post-Office, and was later directed to design the extension of the Treasury Building; all of which, as to exterior, were, in the main, continuations of the old designs. The extensions of the Interior Department (generally known as the Patent-Office) and Post-Office were carried out under his superintendence, without additional compensation. But in the case of the Treasury Building, Mr. Walter, finding himself overtaxed with work, declined to work out in detail his design, which was therefore intrusted to Mr. Young, who was then named the "Supervising Architect of the Treasury Department," under whose care the south wing of the building was built. This was the commencement of a system of management which has been greatly enlarged and still exists. Mr. Young was succeeded by Isaiah Rogers of Cincinnati, a very distinguished architect who had designed the Tremont House at Boston, the Astor House at New York, the Merchants' Exchange, New York, and the Burnett House of Cincinnati. Mr. Rogers was succeeded by A. B. Mullett, a young architect of Cincinnati of very little experience. Under his administration all the government buildings being erected in the North were put under his sole direction, and civilians were appointed as local superintendents.

During this period of 12 years the government buildings of New York, Boston, Philadelphia, Cincinnati, St. Louis and Chicago, and a hundred others of less importance, were commenced, some completed and others nearly completed, and the State, War and Navy Departments at Washington had been commenced. The cost of those mentioned was upwards of thirty millions of dollars, and the aggregate cost of all the buildings erected under his administration was over one hundred millions of dollars.

Mr. Mullett was succeeded in office by William A. Potter, a young but experienced architect of New York. He was obliged to finish Mr. Mullett's work, and in the designing of new government buildings attempted to endow them with artistic beauties, to which the office had ever before been a stranger. But he found it to be a herculean task to reform its methods of design. In all these efforts he was subjected to unjust criticism, influenced mainly by the jealousy of his predecessor. He, however, succeeded in leaving his impress upon some of the smaller buildings that were designed during his term, notably those at Covington, Kentucky, and Fall River, Massachusetts. He resigned in despair after a few years, and was succeeded by James G. Hill of Boston, who had been head draughtsman in the office for many years. Mr. Hill was entirely at home in the routine of the office, and made some improvements in Mr. Mullett's methods. He was succeeded by M. E. Bell of Des Moines, Iowa. Since then the politics of the administration has changed twice, and each time there has been a change in the office. As it has become thus a political office it is of no consequence who the incumbents have been. The duties are rather perfunctory than professional, and nothing can be expected from it that has any interest to the students of architecture. The designing is done by employees who get no credit for it.

OTHER PUBLIC BUILDINGS. A few, and some of them very notable, public buildings have been outside of the jurisdiction of the Supervising Architect of the Treasury Department. At Washington they comprise the Smithsonian Institution, the National Museum, the Army Medical Museum, the Pension Building and the National Library, formerly known as the Congressional Library. The National Museum is from the designs of Cluss and Schulze of Washington. The Pension Building was designed and erected under the supervision of (retired) General Montgomery C. Meigs, formerly in the engineer corps of the regular army, while he had been for many years the superintendent of the Capitol extensions, and had designed many engineering works for the government, among which is the celebrated Cabin John Aqueduct Bridge, near Georgetown, District Columbia. The National Library at Washington is, next to the Capitol, the most important and attractive building ever erected by the government. It is now nearly completed, and the cost will be about $5,000,000. The design was the result of a competition in which J. L. Smithmeyer and Paul J. Pelz were awarded the prize. The design was improved, and the building commenced by this firm. But subsequently an act of Congress put the building under the direction of the retired chief of engineers of the army. Mr. Smithmeyer was discharged and Mr. Pelz retained as architect. It is generally understood that the building was designed by Mr. Pelz, and it is a fact that the entire exterior was built after his drawings. Before its completion, Edward Casey, a son of the engineer in charge, was appointed architect, and much of the interior decoration has been designed by him. It is being adorned by many works of painting and sculpture executed by the most eminent American painters and sculptors. (See NATIONAL LIBRARY, in these Supplements.) One of the most prominent buildings in Washington is the State, War and Navy Departments, an immense granite pile covering an entire square. It was originally designed in the office of A. B. Mullett, Supervising Architect of the Treasury Department. It was subsequently turned over to General Casey, of the engineer corps of the regular army, and the original design was carried by him to completion. Erected in many successive divisions, its construction went on for twenty years, at a cost of about $10,000,000.

STATE AND MUNICIPAL ARCHITECTURE. During the century of governmental experience in building above described the states and municipalities, which were rapidly growing in wealth and importance, continued to erect public buildings, many of which are equal if not superior to those of the general gov-

ernment. Among the earliest of these is the Massachusetts State House at Boston, from the designs of Charles Bullfinch, who was also in charge of the United States Capitol until its completion according to the original design in 1830. His practice was very large, and he was not only the first, but almost the only, architect in the country outside of government employment. Among the early public buildings of America is the New York City Hall, erected during the first decade of the century by Mangin, a French architect, the first and for a long time the only example of French Renaissance architecture in the country. The Philadelphia Mint is another historical building designed by Strickland, who was a painstaking student of Stuart and Revett's *Athens* and studied Greek details with great minuteness. His pupil, Thomas U. Walter, gained the Girard College competition and enlarged and adapted the Greek Corinthian order of the Choragic monument of Lysicrates to a peripteral temple, planned as to the exterior very much like the Parthenon and without windows. (See GIRARD COLLEGE, in these Supplements.) Strickland, the teacher of Walter, was the largest private practitioner of architecture in America during the latter part of the first half of the century. He designed the largest of the state capitols, that at Columbus, Ohio, which is an immense square limestone building, with four Doric porticos of the order of the Parthenon, one at the center of each side. (See OHIO, in these Supplements.)

His last work was the state capitol at Nashville, Tennessee, another classic Greek building. It was uncompleted when the Civil War broke out, and being the scene of many incidents of the war, remained in an unfinished condition until some years after. It has since been finished. (See TENNESSEE, in these Supplements.)

Other public buildings of the first half of the century comprise the works of Haviland, Ithiel Town and Alexander J. Davis. Haviland was an enthusiast upon Egyptian architecture. There is still standing on Walnut Street, Philadelphia, a white marble building by Haviland, in the Egyptian style, and he also designed the residence of Commodore John C. Stevens on Barclay Street, New York, long since demolished, which was Egyptian on the outside but Greek inside. Two prominent landmarks in Philadelphia are the chimneys of the Fairmount Water-Works, which are designed in imitation of Egyptian columns. But Haviland's most prominent work is "The Tombs," or city prison, on Center Street, New York. Ithiel Town was a resident of New Haven and an enthusiast in Greek architecture, which he studied to reproduce with great exactness. But he was at one time in partnership with Alexander J. Davis, and together they designed the Tudor-Gothic University building on Washington Square, New York, taken down in 1895. The former Merchants Exchange, now the Custom House on Wall Street, New York, was designed by Isaiah Rogers. It is still considered the most imposing Greek building ever erected in America, its monolithic Ionic columns at the portico being unsurpassed even by the Treasury Building at Washington. Both are of granite, in the Ionic style. The old Custom House, now the Subtreasury, in New York, covers the historic site of the old State House where Washington delivered his inaugural address. The very spot is marked by Ward's statue of Washington. The building is of white marble, even including the roof tiles, and is almost an exact copy of the Parthenon at each end, omitting the sculpture. The marble of the columns is set without mortar joints. The design was by an English architect, William Ross, though an inscription on the north end has a name claiming to be that of the architect, the person, however, having only been the superintendent of stone-cutters. A full account of this building, with the original designs can be found in Volume 5 of *Loudon's Magazine* (London, 1835.)

EARLY CHURCH ARCHITECTURE. A well-known architect at this time was Minard Lafever, who was a self-taught man, having commenced as a carpenter's foreman. He has left several illustrated works on the styles of architecture then practiced in America. His study was to adapt classic details to all purposes for domestic use, and he set the patterns for wood and plaster work which others followed for many years. His best works were a classic one-story savings bank on Fulton Street, Brooklyn, and the Church of the Holy Trinity on Montague Street, Brooklyn. Had the latter occupied as prominent a site as Trinity Church, New York, he would doubtless have attained as great a fame as the senior Upjohn. The last of the old school of architects to be mentioned is Richard Upjohn. His fame as a church architect covered the whole country, but his principal works are in New York. His first church in New York was the Church of the Ascension, corner of Tenth Street and Fifth Avenue, then quite in the suburbs. His fame rests mainly on the rebuilding of Trinity Church, New York, the best example of late Perpendicular Gothic in this country, while Lafever's Trinity was in Flamboyant Gothic. There the perfection of thirteenth-century Gothic was not appreciated, but Upjohn used it in his later works, when his son in law, Charles Babcock (afterward professor of architecture at Cornell University), became associated with him. Their practice culminated in the erection of Trinity Chapel on Twenty-fifth street, New York, the most perfect specimen of Gothic architecture in America. Between these there was a list of works too long to mention. Upjohn designed St. Thomas Church, New York, when his powers were on the decline. Still it has many original features studied from Ely Cathedral in England. Of the old line of American architects the last to die was Alexander J. Davis, who had lived nearly all his life in the old University Building on Washington Square, New York, which he designed.

ORGANIZATION OF THE AMERICAN INSTITUTE OF ARCHITECTS. The revival of architecture in America in the last half of the century commences very nearly with the organization of the American Institute of Architects in 1857. At that time the profession had increased so greatly in numbers that every large city had several offices,—New York about 100, Philadelphia and Boston about fifty each,

and the other cities in proportion. From this time on it is difficult to name individual buildings without partiality. Only such typical ones as are necessary to make the narrative clearly understood can be given. Up to that time, and as late as 1870, the general character of the buildings in the large cities was one of wearisome monotony. Domestic buildings were nearly all repetitions not only in design, but in plan, and little originality was seen except in church architecture and a few of the business buildings. The modern office building was almost unknown, and while most of those who transacted business in offices used the rooms of old discarded dwellings, the only buildings erected for offices were the banks and insurance buildings, in which the surplus space over the main floors was rented out for these purposes. The first building of any pretensions erected solely for offices is believed to be the Trinity Building at New York, which was designed by Richard Upjohn. The best civil architecture of that time was seen in the banks and insurance buildings of the large cities, many of which had considerable architectural merit, and were admirably built. Among such were the American Exchange and Continental banks of New York, by Leopold Eidlitz. There was great advance at the same time in commercial architecture in Cincinnati, mainly through the example of the late James K. Wilson of that city. Cincinnati also took the lead in suburban residences, evidenced by the mansions of Probasco, by William Tinsley, in the Norman style, and Shoenberger, by Wilson, which latter was the first of the remarkable series of revivals of the fifteenth-century Gothic of Rouen, and the chateau style of Francis I, which has later been handled so admirably by the late Richard M. Hunt.

It was about 1860 that the influence of the Gothic revival of England and its adaptation to all classes of buildings began to be evident in this country. Before that time the advent of Jacob Wrey Mould at New York had attracted the attention of the New York architects to his free and carefully studied treatment of the Romanesque style, as seen in the Unitarian Church on Fourth Avenue, New York. It was one of the first examples of thoroughly scholarly architecture from foreign hands. This was followed by his beautiful free Gothic Parish Schoolhouse attached to Trinity Chapel. Mould then gave character and beauty to most of the architectural features of Central Park, whose details have never been surpassed. The most prominent expression of the modern Gothic idea was seen in the National Academy of Design at New York, by Peter B. Wight, in which the Italian influence was predominant. Of other buildings of this class may be mentioned the Jefferson Market Courthouse, New York, by Frederick C. Withers; the Brooklyn Art Association building, by J. Cleaveland Cady; and the Brooklyn Library, by Wight. These were followed by the Yale School of Fine Arts at New Haven, by Wight; the Durfee and Farnham dormitories and the new Memorial Chapel at Yale College, by Russell Sturgis; and the Divinity College at New Haven, by Richard M. Hunt. In Boston the new Art Museum, by the late John H. Sturgis, and the Sears office building and Boylston block, by Cummings and Sears, were noticeable examples. A less successful example is found in Philadelphia, the Pennsylvania School of Fine Arts, by Frank Furness, and the most prominent one is the Connecticut State House at Hartford, by Richard M. Upjohn. This brings us up to 1870. The Gothic revival was well launched in America before the Centennial Exhibition at Philadelphia in 1876, which had but little influence upon it. This, however, gave a great impetus to the encouragement of correct design in all the accessories of architecture, in ornamentation and carving in the mediæval manner and its employment in manufactures. The movement had little or no encouragement in Chicago after the great fire of 1871, which destroyed the entire heart of the city and half of its outlying parts.

Richardson and His Work. The influence of Henry Hobson Richardson began to be felt about 1873. He had executed various works before this time in different styles, and had designed the very fine French domestic Gothic front of the American Express building in Chicago, in the style of the old houses of Cluny. But when he built the new Trinity Church at Boston, a new era in American architecture commenced. It was the beginning of a short but brilliant career, in which he executed dozens of large and important buildings in a modification of his own of the old Romanesque architecture of France, upon which he so stamped his own individuality that he became the recognized leader of a modern school of architectural practitioners. Trinity Church was only the stepping-stone to these achievements. The most perfect developments of his style are to be seen in the library buildings of Woburn, and many others of the small New England cities. His later work was distinguished rather by grandeur of style and boldness of treatment, as seen in the courthouse of Pittsburgh, the Chamber of Commerce at Cincinnati, and the Field wholesale store at Chicago. He was a national architect in fact, for his works were pretty evenly distributed through the great centers of his country. Hence he had a host of disciples and followers, some of whom could produce equally good work. He educated at least a hundred architects, who spread his ideas everywhere. There was one time a belief that this influence would be permanent. While Richardson was at the top of his fame there arose another genius in Chicago, John Wellborn Root, of the firm of Burnham and Root of that city. He was more original and versatile than Richardson, but many of his works had similar characteristics of design. The young architects of Chicago and the Western cities tried to follow in his wake, and his influence was large; but when it was added to that of Richardson, it bid fair to result in an independent school. An independence of precedents was seen in the designs of thousands of the less expensive classes of business buildings, but mainly in the dwelling-houses of the Western cities, which resulted in greatly improving their street architecture, for so much new building was being carried on then that ten years was enough to almost change the appearance of a town. This was in the nature of an advance in rational methods of building and the dis-

carding of all kinds of meritricious ornaments and materials, as well as the encouragement of artistic stone-carving wherever most appropriate.

One evidence of the advance of this spirit of reform was seen in the rebuilding of the business part of the city of Boston after the great fire of 1872, in which nearly every new building was free from the affectation of previously accepted styles of architecture, and took on an appearance of freshness and reality which bid fair to make Boston a center of rationalism. By some the use of modern Gothic details was carried to a ridiculous extreme, and they became grotesque in the hands of those who did not know how to handle them, while honest methods of building were neglected.* The movement in the East began to be overshadowed by the growing influence of the modern French school, which was encouraged by the schools of architecture established at various centers of learning. By the time that the World's Columbian Exposition at Chicago was projected and formulated this influence became most potent, and it is safe to say that in the West it dates from the sudden and unfortunate death of John W. Root in January, 1891. The adoption of a classic treatment for the main buildings of the Exposition gave a stamp of approval from high authority to the new movement, and the influence exerted by the wonderful object-lesson afforded by the aggregation of classic architecture around the Court of Honor, as it was called, has been felt throughout the country ever since. Still a large number of prominent buildings in the style of Richardson have been projected since that time, and while under the leadership of the architects of New York and Boston various adaptations of the modern academic French style, together with a tendency to revive Greek details, have prevailed, the architects of the West have displayed more independence.

The necessity for erecting extremely high buildings, on account of the improvement and general use of elevators, has been one factor in encouraging this independence of style. It has also resulted in the adoption and invention of new methods of construction which have had no small influence upon architectural design. The buildings designed by Louis J. Sullivan, many of which are among the highest that have yet been constructed, are illustrations of this.

We have now reached a point of time when the examples of modern architecture in America are so numerous that names and buildings can no longer be mentioned with justice to the parties interested, or regard for the proper limits of this article. The consideration of *Building* and *Construction* properly belongs under other heads, and it is only on account of their influence upon design that there exists any reason for describing their present condition in this place. The steel-frame construction, which originated and was developed by Chicago architects, and made it possible to erect buildings from 12 to 20 stories in height, is briefly and concisely described in the *Inland Architect* for April, 1892. We quote the following from one of a series of articles by P. B. Wight, on "Recent Fire-proof Building in Chicago":

"The complete steel-frame building is one in which the frame actually carries the whole building. The outside and inside are one entire homogeneous construction, and the foundations which have been put in for the steel-work are those which are to carry all the other materials. The exterior and interior walls are built *on* and attached *to* the steel frame. Practically, the building has no walls. The exterior frame is protected with fire-proof materials outside and inside, so disposed as to provide for any size or shape of windows that may be desired, and to give a decorative effect on the exterior. On brick, ornamental terra-cotta is used principally for the exterior, and in some buildings entirely, as in the Chamber of Commerce extension and the new German theater (Schiller building), Chicago. Pressed and ornamental brick are also used for fronts, and English enameled brick, with glazed terra-cotta trimmings, are used on interior courts and back walls. The inner surfaces are built with hollow building tiles, either of the hard fire-clay or porous variety. The horizontal members of the steel construction are built so as to carry the entire weight of this exterior and interior covering. The steelwork of such a structure, with all its projections, bay windows and projecting cornice at the top, may be built from foundation to roof before anything else is added. The steel-workers set the pace for the other mechanics. The balance of the exterior and interior work is only a filling. Vertical and horizontal bracing against wind-pressure are introduced. Part of this is permanent and part temporary. In these buildings the floors are now generally built with a filling between the beams of flat, hollow tile arches, and these are often constructed before the exterior inclosing walls are built. But the speed with which such buildings can be completed has been illustrated in cases wherein the workmen who follow after the steel-men have been seen working on the exterior walls at several different stories at the same time. Actual experience has demonstrated that steel construction may be supplemented by fire-clay construction, so as to give a result which it is safe to say is fire-proof."

ROBERT CRAIK MCLEAN.

See also ARCHITECTURE, Vol. II, pp. 382–475.

ARCHITECTS, AMERICAN INSTITUTE OF, an association formed in 1856. Any architect of good standing may become a member by an annual payment of ten dollars for that purpose. Since 1866 it has held annual congresses or conventions in some city previously designated, and its aims are to promote technical study, to diffuse information, to advance the interests of the profession and to disseminate principles of correct taste. In 1895 the Institute was composed of 27 chapters, located in the principal cities of the United States, and a membership of 475 fellows. There were also 57 honorary members. The president at that time was George B. Post, of New York City.

ARCHPRIEST, the title given to the superiors who were appointed by the pope to govern the secular priests sent into England from the foreign seminaries during the period of 1598–1621. This government gave the control of affairs into the hands of the Jesuits, and was opposed by a part of the Church,

*The early advocates and practitioners of the (so-called) Gothic revival did not seek to revive Gothic architecture as practiced in the Middle Ages. They only sought to encourage what they called "Truth in Art," and insisted that the use of a building should be suggested by its structure, and its adornment should grow out of and emphasize its structural necessities, and thereby assist in giving it artistic expression in accordance with its purpose. They therefore opposed the use of all fictitous materials for the purpose of ornamentation, and encouraged schools of carving and painting which would best fulfill these ends. They found these principles to have been followed in the Gothic architecture of the thirteenth century and in Greece during the fifth century B.C. It was natural that half educated architects, who did not understand or care for these principles should go astray, and by merely copying the works of others, or inventing designs which only bore a superficial resemblance to them, bring the movement into ridicule and the contempt of those who had any knowledge of architectural styles. As a matter of fact these misadventures became so common that the comparatively few works expressive of the principles of "Truth in Art" were lost among the mass, and only an expert could pick them out.

who wished for the ordinary government of bishops. The first archpriest appointed was George Blackwell (1598). He was deprived of his office in 1608 for taking, and persuading others to take, the oath of allegiance which had been condemned by Urban V. The second archpriest, George Birket, was appointed in 1608, and died in 1614. The third and last to hold the office was Dr. William Harrison, who ruled the clergy in this capacity till his death in 1621.

ARCH, TRIUMPHAL, a structure erected in a conspicuous and suitable position in honor of a victorious general. The original triumphal arch was the Porta Triumphalis at Rome. Under the emperors these structures became numerous and magnificent, and were decorated with bas-reliefs and inscriptions. Three of what were properly triumphal arches still remain in Rome—those of Titus, Septimius Severus and Constantine. The Arch of Titus was erected after his death, by "the senate and people of Rome," to commemorate his conquest of Judæa. It is of especial interest because of its historic bas-reliefs. These represent the golden candlestick and other sacred utensils of the Jewish temples as they were carried by the captors in triumph into Rome.

ARCIMBOLDI, GIOVANNI ANGELO, an Italian arch-bishop who was admitted to the college of noble jurisconsults in Milan about 1508. He was employed by Pope Leo X on a mission to Germany. Afterward, on going to Denmark, he was employed by King Christian II to assist in his political schemes. He endeavored to undermine the power of Sten Sture, and to secure the reinstatement of Archbishop Gustav Trolle, who had been imprisoned by Sture; but being won by the latter to take sides against the king, he was obliged to flee into Germany, whence he returned to Italy. In 1523 he was made bishop of Novara, and in 1550 archbishop of Milan. He died at Milan, April 6, 1555. He belonged to a distinguished family, other members of which held prominent positions in church and state.

ARCOLA, a village of Venetia, in Italy, near the confluence of the Alpene and Adige, 15 miles below Verona; noted as the scene of Napoleon's great victory over 50,000 Austrians under Alvinzi, Nov. 17, 1796.

ARCOLA, a city in the township of same name, Douglas County, east-central Illinois, at the crossing of the Illinois Central and Terre Haute and Indianapolis railways, about 158 miles S. from Chicago. Population 1890, 1,733; of township, 3,198.

ARC-LIGHT. See LIGHTING, Vol. XIV, pp. 632, 633.

ARCON, JEAN CLAUDE ELÉONORE LE MICHAUD D', a French military engineer; born at Pontarlier, 1733; died at Auteuil, 1800. See GIBRALTAR, Vol. X, p. 586.

ARCTIC ZONE, a name applied to that region of the earth which lies between the parallel 23° 27′ N. lat., and the north pole. It is so called because immediately beneath that portion of the heavens which is swept by the constellations of Arcturus, or the Great and Little Bear, in their daily circlings around the pole-star. The parallel 23° 27′ is called the arctic circle.—ANTARCTIC ZONE and ANTARCTIC CIRCLE denote the corresponding region and line around the south pole, and the parallel 23° 28′ S. lat.

ARCTIC EXPLORATIONS. See POLAR REGIONS, Vol. XIX, pp. 315–330; and POLAR EXPLORATIONS, in these Supplements.

ARCTIC HIGHLANDS, a name sometimes applied to that portion of the American continent which lies between Hudson Bay and the mouth of the Mackenzie. Over them have been made nearly all the overland efforts in connection with the exploration of the Northwest Passage, from Hearne's discovery of the copper-mine down to the recent voyage of Anderson, the most prominent among the intermediate laborers having been Franklin, Richardson, Back, Dease, Simpson and Rae.

ARCTURUS, a star. See BOÖTES, in these Supplements.

ARCUATION OR INARCHING. See HORTICULTURE, Vol. XII, pp. 213, 236.

ARCUS SENILIS, a term used of a change occurring in the cornea of the eye, in consequence of fatty degeneration of its marginal part. It is thought by late observers to indicate the co-existence of fatty degeneration of the heart. It usually commences at, or even before, the age of 40 years, as an opaque, whitish crescent skirting either the upper or lower margin of the cornea, and afterward extends along the edge till it finally becomes a complete circle, which sometimes assumes a chalky whiteness. See OPHTHALMOLOGY, Vol. XVII; p. 781.

ARDAHAN OR ARDAGAN, a fortified town of Russian Armenia, 35 miles N.W. of Kars. On account of the severity of the climate, the houses of Ardahan are mainly constructed underground. Its position gives it strategic importance. It is on the Koor River, and was acquired by Russia in the war of 1878. Population, 2,000.

ARDASHIR, ARDESHIR OR ARDOHIRS, I, II, III, Sassanian kings. See PERSIA, Vol. XVIII, pp. 607, 608, 610, 615. Also a name for the Achæmenian kings called Artaxerxes by the Greeks.

ARDEIDÆ, a family of birds. See HERON, Vol. XI, p. 760.

ARDEN, a forest and district. See SHAKESPEARE, Vol. XXI, pp. 738, 739.

ARDITI, LUIGI, musician and composer, was born in Piedmont, Italy, July 16, 1825, and studied music at the Conservatory of Milan. Famous first as a violinist, then as a conductor, he went to London in 1857, and from that year till 1878 was musical director at Her Majesty's Theatre. He has conducted Italian operas and concerts from New York to Constantinople; has published the operas *I Briganti* (1841) and *La Spia* (1856), and is known as the author of much popular music—songs, violin duets and waltzes, such as *Il Bacio*.

ARDMORE, a suburb of Philadelphia, Pennsylvania, is 7 miles N.W. of that city. Yarn and worsted are manufactured here, and there are many fine residences. Population 1880, 519; 1890, 2,205.

ARDOYE, a town of Belgium, in the province of West Flanders, 17 miles S.W. of Bruges. It has extensive cloth-weaving works. Population, 6,100.

ARE, a unit of land-measure. See WEIGHTS AND MEASURES, Vol. XXIV, p. 490.

ARE OR ARI, THORGHILSSON. See ICELAND, Vol. XII, p. 624.

AREA, a term in mathematics meaning quantity of surface. The calculation of areas, or mensuration of surfaces, is one of the ultimate objects of geometry. The measuring unit is a square inch, a square foot, etc., according to the unit of length. As a figure is thus measured by finding an equivalent for its surface in squares, the process is sometimes called the quadrature of the figure. See *Plane Figures*, under MENSURATION, Vol. XVI, pp. 14–22.

ARECA PALM. See BETEL-NUT, Vol. III, p. 616.

ARECIBO, a seaport on the north coast of Porto Rico, Spanish West Indies, 45 miles W. of San Juan, and capital of the province of Arecibo. The harbor at this point permits the entrance of only small vessels. Population, 11,187.

AREMBERG, a family of Prussia. See Vol. II, p. 481.

ARENA, a part of an amphitheater where the combats of gladiators and wild beasts took place. It had four main entrances, and was surrounded by a wall 15 feet high, so that the spectators were perfectly safe. The name was afterward applied by the Romans to any building for exhibitions of baiting animals, horsemanship, etc. On the Continent the name has been given to large summer theaters for dramatic performances in the open air. It is applied, also, to any scene of contest or display of power. See AMPHITHEATRE, Vol. I, p. 775.

ARENARIA, a genus of dicotyledonous plants of the family *Caryophyllaceæ*, to which the "pinks" belong. The species are numerous; some of them are arctic and alpine, and some are chiefly found in sandy soil, from which they are known as "sandworts." They are closely allied to the "chickweeds."

ARENDS, LEOPOLD ALEXANDER FRIEDRICH, was born near Wilna, in Russia, Dec. 1, 1817. He was educated at Dorpat, and in 1844 settled in Berlin, where he died, Dec. 22, 1882. He founded the system of "rational stenography," first published fully in 1860 in his *Vollständige Leitfaden*. It is the latest of the three great rival systems in Germany, the others being those of Gabelsberger and Stolze. It is perhaps the most widely used, and it has been introduced into the Spanish, French, Hungarian and Swedish languages.

ARENICOLA, a large annelidan worm, characterized by a series of tufted arborescent gills, of a bright red color, along the sides of the back. They live in the sand near the seashores, and are often known as sandworms, or bugworms. They are used as bait by English fishermen. Some are found along the Atlantic coast of the United States.

ARENTZEN, CHRISTIAN AUGUST EMIL, a Danish poet, was born at Copenhagen, Nov. 10, 1823. *Baggessen og Œhlenschlæger* (8 vols., 1870–78), a presentation of the Danish literature of this century, is his chief work. His *Nordisk Mythologi* has passed through three editions. He was decorated with the order of Danebrog for *Œhlenschlæger*. His *Literaturhistorisk Livsbillide* was written for a centennial festival in 1879.

AREOMETER, virtually a hydrometer. See HYDROMETER, Vol. XII, p. 536.

ARETINIAN SYLLABLES, the syllables *ut, re, mi, fa, sol, la*, used by Guido d'Arezzo for his system of hexachords. See GUIDO, Vol. XI, p. 257.

ARETINUS, LEONARDO BRUNI. See BRUNI, Vol. IV, p. 399.

AREZZO, a province in the compartimento of Tuscany, Italy. It is traversed by the Apennines and by the rivers Anno and Chiara. Its area is 1,276 square miles, and its capital and largest town is Arezzo. Population 1890, 242,506. For the city of this name, see Vol. II, p. 486.

ARGÆUS, MOUNT, a mountain in the pashalic of Karamania, Asia Minor, about 12 miles S. of Kaisariyeh. It is the highest peak in Asia Minor. Elevation, 13,100 feet.

ARGALI (*Ovis ammon*), the great wild sheep found in Siberia and Central Asia from Kamchatka to the Himalaya Mountains. The immense horns of the male are sometimes four feet long and twelve inches in circumference at the base. The animal is closely allied to the Rocky Mountain sheep (*Ovis montana*).

ARGAN, a tree. See MOROCCO, Vol. XVI, p. 833.

ARGAND BURNER. See LAMP, Vol. XIV, p. 245.

ARGEMONE, a genus of dicotyledonous plants of the family *Papaveraceæ*, to which the "poppy" belongs. It is a native of Mexico and the southern part of the United States, where several species occur, the best known of which is *A. Mexicana*, a species extensively cultivated in both hemispheres. The juice of the plant is employed both in Europe and the United States as a remedy for ophthalmia.

ARGENS, JEAN BAPTISTE DE BOYER, MARQUIS D', was born at Aix, June 24, 1704, and died in Toulon; Jan. 11, 1771. Being disabled by accidents in military service, and disinherited by his father, he tried his fortune in authorship, and by his *Jewish Letters* and *Chinese Letters* attracted the notice of Frederick II, then crown prince of Prussia, and after the accession of the latter, became a favorite at his court. He wrote a *History of Human Wit* (14 vols.)

ARGENSON, MARC PIERRE, COMTE D' (1696–1764), a celebrated French statesman who was secretary of war from 1742 to 1747, having earlier been controller-general of the finances, to which office John Law succeeded. Argenson established the *École Militaire* in 1751, and by various measures kept alive the military spirit of the nation. He was a liberal patron of literature; was exiled to his estate in 1756, having incurred the hostility of Madame de Pompadour.

ARGENSON, PIERRE DE VOYER, VISCOMTE D' (1626–1709), French soldier. From 1657 to 1661 was governor of Canada, where he made explorations about Lake Superior and Hudson Bay. He served with distinction at the siege of Bordeaux and at the battle of Sens.

ARGENTEUS CODEX. See PALÆOGRAPHY, Vol. XVIII, p. 148.

ARGENTINA, a genus of small fishes, remarkable for the resplendent silvery luster of their sides and the abundance of nacre, the substance used in

making artificial pearls. See SALMONIDÆ, Vol. XXI, pp. 221, 224.

ARGENTINE, a city of Wyandotte County, northeastern Kansas, is 4 miles by rail W. of Kansas City, Missouri. Ironware and furniture are manufactured here, and there are large gold and silver smelting-works. Population 1890, 4,732.

ARGENTINE REPUBLIC. For its geography and general history up to 1880, see Vol. II, pp. 487–496.

The constitution of the Republic, which is essentially similar to that of the United States, provides that the president shall hold office for six years and shall be ineligible to re-election.

In 1880 President Nicolás Avellaneda was succeeded by General Julio A. Roca, who had been minister of war under the preceding administration. In the latter capacity he had led a famous expedition into Patagonia, which had freed that vast territory from Indian domination, and opened it for pastoral and agricultural uses up to the Rio Negro River. During the administration of General Roca railroads were built, educational facilities were improved, numerous colonies were established in the fertile interior, and the country prospered as never before. The financial soundness of the Republic was unchallenged. In 1886 General Roca was succeeded by Don Miguel Juarez Celman. During the administration of the latter there convened in Montevideo, Uruguay, under the auspices of the republics of Argentine and Uruguay, from Aug. 25, 1888, to Feb. 18, 1889, a congress of seven South American republics. Here were signed various treaties on matters of international law, patents, etc., which mark an epoch of progress in the commercial and political relations of the South American republics. The peace and prosperity of the Argentine Republic continued practically uninterrupted until 1890, when the disastrous financial policy which had been followed for more than a decade finally resulted in a revolution, and the temporary destruction of the country's credit. The unlimited issue by the national and provincial banks of bonds, or *cedulas*, which had state guaranty, but were secured by no actual capital, finally led to the conduct of the government in the interests of gamblers and speculators. In the month of July, 1890, business had become stagnant, gold was at 320, and thousands of emigrants were leaving. Citizen demands for a change in the government had accomplished no relief of the condition, and on the morning of the 26th of that month the Tenth infantry, with General Manuel Campos at their head, left their barracks in open revolt. This action was the first in a rapidly moving revolution, whose leaders announced Señor Alem as their president, and which, by force of arms, had power in Buenos Ayres for three days.

President Celman, though victorious in the field, was unable to retain office, and having made himself universally unpopular, resigned on October 5th, being promptly succeeded by Vice-President Carlos Pelligrini. Confidence was temporarily restored and gold fell to 125. The trouble, in November, of the famous London banking-house of the Baring Brothers prevented the negotiation of a national loan in European markets. The actual failure of the Barings on account of the depreciation of their immense holdings of Argentinian securities was prevented by the formation of a committee of London bankers, who guaranteed the Barings' liabilities. From this committee the government received a proposal for conversion of the *cedulas*, which favored, however, only the province of Buenos Ayres. Uprisings in the neighboring provinces, and a definite plot to overthrow the existing government and replace Celman in power, resulted, and were suppressed with considerable difficulty. Throughout the winter of 1890–91 the financial affairs of the country remained in a chaotic condition. Rash measures followed each other in rapid succession, and restoration of prosperity seemed hopeless. The credit of the government was sustained by a series of national loans. The elections of 1892 were marked by much disturbance. A reduction in 1891 of almost 75 per cent in the value of imports, and an enormous increase in the value of the agricultural and pastoral products, seemed to promise Argentina the commencement of a happier era in material affairs. The state of political unrest was the chief factor in retarding such a betterment. General Mitre, whose candidacy for the presidency promised to restore confidence at home and abroad, formally withdrew from the contest. Dr. Luis Saenz-Peña was finally elected president, and was inaugurated Oct. 12, 1892. This was not accomplished, however, without a number of disturbances of a grave nature in Buenos Ayres. On the evening of April 2d that city was proclaimed to be in a state of siege, on account of the discovery of a gigantic conspiracy to start an insurrection, murder the chief authorities and proclaim Dr. Alem dictator. The new administration was a troubled one from the beginning, and President Saenz-Peña resigned his office Jan. 22, 1895, to be immediately succeeded by Vice-President José Uriburu.

The precise boundaries between the Argentine Republic and Bolivia, Chile and Brazil are in a moderate state of dispute. In the case of Brazil, the matter is referred to the President of the United States. The other disputed limits have been left to the settlement of commissioners appointed by the contending governments.

The republic has, according to a census of 1895, an area of about 1,190,000 square miles, and a population of 4,092,990.

The capital of the republic, Buenos Ayres, has a population (1895) of 663,854. Other important towns are Cordoba, 42,783; Rosario, 93,584; Tucuman, 34,297; Mendoza, 28,803; Parana, 24,099; Salta, 16,672; Corrientes, 16,060; La Plata, the new capital of the province of Buenos Ayres (founded 1884), 43,406.

The increase of population has been due greatly to immigration. Most immigrants are from the south of Europe, Italy sending 60.3 per cent of the whole.

The army comprises 37 generals, 685 infantry officers, 507 cavalry officers; rank and file, 6,498—this number to be increased to 14,000. The militia comprises 412,000 men between 17 and 45 years, and 68,000 reserve, between 45 and 60 years.

There is a military school with 125 cadets, and a school for non-commissioned officers. The naval school has 60 cadets, and the school of gunners, 80.

In 1895 the navy of the Republic included 1 seagoing armor-clad, 2 coast-defense armor-clad monitors, 3 deck-protected cruisers, 8 gunboats, 2 transports, 3 screw and 4 paddle dispatch-boats, 1 torpedo school-ship, 8 torpedo-boats, 6 spar torpedo-boats, and 1 sailing-corvette. There are, in all, about 58 guns. The navy is manned by 1,530 officers and men. A new armored cruiser was added in 1892, and six more first-class armored cruisers were building in 1896.

Commercially, Argentine Republic is practically a European colony, having been almost wholly developed by European capital and enterprise. English investments alone amount to nearly $100,000,000.

The area of the land under cultivation is but 15,000,000 acres, or 6 per cent of the total available area. The chief agricultural products are wheat, maize and flax. Cattle and sheep breeding are industries of very great importance, about 750,000 cattle being slaughtered annually. Of sheep there are 63,611,108 in the Republic.

The value of the agricultural products exported in 1889 was $16,935,547; for the first six months of 1890, $31,863,605. The value of the agricultural yield in 1893 in the Republic is estimated in a British consul's report at over $117,000,000.

The external debt on Dec. 31, 1892, amounted to $189,857,000; the funding loan issued up to July 1, 1893, amounted to $32,965,000; total foreign debt, $221,822,015. The service of the foreign debt for 1894 is estimated at $7,825,000; internal and bank bond debt, $5,375,000; service of total debt, $12,700,000.

The inventory of property belonging to the national government, prepared according to the decree of March 28, 1888, already amounts to $703,793,172.

The following table shows the official values in thousands of dollars gold of the imports and exports (exclusive of coin and bullion) for three years, including re-exports:

| | 1890 | 1891 | 1894 |
|---|---|---|---|
| Imports | 142,300 | 67,193 | 92,724 |
| Exports | 104,528 | 98,964 | 101,249 |

More than one half the total tonnage entered is British. Internal improvements have progressed but slowly up to very recent years, on account of the poor financial condition of the country. Concessions have been recently made for the building of railways by foreign capital. There are now about 9,000 miles of railway in operation. The number of miles of telegraph lines approaches 25,000. The country, as a whole, is in a condition of rapid development, and its almost unlimited resources and admirable climate give promise of great prosperity and a foremost place among the republics of South America.

REFERENCES. *Argentine Republic* (1894), Bulletin No. 67 of the Bureau of American Republics, at Washington, District of Columbia; *Argentina and the Argentines* (Turner, 1892); *Round and about South America* (Vincent, 1890); *Historia de Confederacion Argentina* (A. Saldias, Buenos Ayres, 1892).

ARGENTITE. See MINERALOGY, Vol. XVI, p. 392.

ARGES, a genus of small fishes found in lakes in the volcanic regions of the Andes. Humboldt states that vast numbers are ejected from subterranean lakes, and scattered over the land by volcanic eruptions.

ARGIL is a term used to describe white potter's clay, or, more technically, alumina or pure clay.

ARGIVES is the word used in the Homeric poems to indicate the Greeks; literally, inhabitants of Argos, a plain. Agamemnon was the king of the Argives, who were, at the time of the Trojan war, by far the most powerful of the Greek tribes.

ARGO, a southern constellation, named after the legendary ship in which the argonauts sailed in their search for the golden fleece. In this extensive constellation is contained Canopus, a star of the first magnitude.

ARGOLIS, a state of Ancient Greece, the northeast peninsula of Morea, lies between the bays of Nauplia and Ægina. It forms a department in the modern kingdom of Greece. The plain of Argolis, famous in ancient times for breeding horses, is now made pestilential by morasses. It was colonized in very early times. Inachus settled here in 1800 and Danaus in 1500 B.C. Here Pelops ruled and Hercules was born. Modern Argolis is built on the site of the ancient city. Argolis and Corinth, which form a nome of modern Greece, have an area of 1,447 square miles, and a population of 127,820.

ARGON, a new gaseous constituent in the atmosphere, has been discovered by Lord Rayleigh and Professor Ramsay of England. The former had observed that the density of nitrogen varied considerably, according to the source whence it was obtained. Supposing this to be due to a variable amount of some other unknown gas, he added to air an excess of oxygen and passed electric sparks through it. The density of the nitrogen gradually increased until it reached 19.8. Professor Ramsay, on the other hand, by removing the oxygen from the air, and passing the nitrogen over heated magnesium, which was thereby converted into nitride, obtained a residual gas having a density of 20.8. It is more inert than even nitrogen, and exists in air to the amount of one per cent. It exhibits two spectra, according to the strength of the discharge and the degree of rarefaction of the gas. In one the color is largely orange-red, in the other, under less pressure, it is blue. About 200 lines have been measured. A mixture of pure liquefied oxygen and nitrogen forms a clear liquid, while air in a similar state shows a turbidity, which is probably due to the new gas. It may prove to be a mixture of two or more gases, and may even turn out to be only an allotropic form of nitrogen, just as ozone is of oxygen. It is worthy of remark that certain experiments of Cavendish, made about a hundred years ago, pointed to the presence in the air of some substance other than the gases with which we are already familiar. Some experiments of Ramsay and Berthelot point to the formation of compounds of the gas with carbon and benzene. Small quantities of the gas have been found in some rare minerals and in mineral waters,

and the National Academy of Sciences of the United States in April, 1895, awarded the discoverer, Lord Rayleigh, the "Barnard Medal for Meritorious Service to Science," a gold medal worth two hundred dollars. Two prizes of ten thousand dollars each, one given by the French Academy of Sciences, the other the gift of the Smithsonian Institution, have been assigned to the discoverers of argon.

ARGONAUT OR PAPER, NAUTILUS, a mollusk of the class of cuttle-fishes, *Cephalopoda*. The females possess a delicate rear-chambered shell, which is not analogous with those of other mollusks. The argonaut is more closely related to the devil-fish, octopus, than to the nautilus, with which it is often confounded.

ARGOS, a town of Marshall County, northern Indiana, is 93 miles by rail E. of Chicago, and 110 miles N. of Indianapolis. Lumber and flour are manufactured here. Population 1880, 622; 1890, 1,101.

ARGOT, originally the jargon used in France by rogues and thieves for purposes of secret communication. The origin of the word is uncertain. In some form or other such a language has been extant for an indefinite time among all the nations of Europe. M. Charles Nodier has made claims for the imagination and wit of the language. A more recent work, however, *Argot and Slang* (1887), by M. Albert Barrère, which is a complete dictionary of its words and expressions as now known, fails to disclose any number of words not belonging to the prison or the brothel, and reveals it to be a very limited tongue, lacking in the wit claimed for it by M. Nodier. M. Francisque Michel published, in Paris, 1856, a large volume on argot. In the writings of Hugo and Dickens may be found many examples of the use of this language.

ARGOUT, ANTOINE MAURICE APPOLLINAIRE COMTE D', was born at Veissilieu, France, Sept. 27, 1782, and died in Paris, Jan. 15, 1858. He became a peer of France in 1819, and in the revolution in 1830 undertook to carry out negotiations between the king and the people, which were too tardy to be effective. He was minister of commerce in 1831, minister of the interior in 1833, and governor of the Bank of France from 1834 until his retirement from public life.

ARGUELLES, AUGUSTIN, Spanish politician of the liberal school, was born at Ribadesella, Aug. 28, 1776, and died in Madrid, March 23, 1844. He was one of the committee of the Cortes which drew up the new constitution, but, on the return of Ferdinand VII, fell a victim to the reactionary spirit which ensued in 1814, was arrested and sentenced to ten years' confinement in prison at Ceuta. Fourteen persons were condemned with him, and they experienced such barbarous treatment that in four years three died, two became mad, and the rest received grievous injuries. But the revolution of 1820 restored Arguelles to freedom, and he became minister of the interior. During the regency he was appointed guardian of the young Queen Isabella.

ARGUS, a genus of gallinaceous birds, to which the argus-pheasant belongs, remarkable for magnificence of plumage. The argus is a native of the East Indies. The sides of the head and neck are destitute of feathers; the tail consists of 12 feathers, of which the two middle ones of the male are nearly four feet long.

ARGYLE, capital of Washington County, northeastern New York, is 45 miles N. of Albany, 7 miles E. of the Hudson River, and has no railway connections. Population 1880, 316; 1890, 158.

ARGYLL OR ARGYLE, GEORGE DOUGLAS CAMPBELL, DUKE OF, was born at Ardencaple Castle, in Dumbartonshire, in 1823. When 19 years of age he published a *Letter to the Peers, from a Peer's Son*, written in the interests of Scottish Presbyterianism. He succeeded his father in 1847, and became at once an active member of the House of Lords. He was made lord privy seal in 1853, and had charge of postal affairs from 1855 to 1858. He was hereditary sheriff of Argyleshire, and was appointed lord-lieutenant in 1864. From 1868 to 1874 he was secretary of state for India. He traveled in the United States in 1878. Among his published works are *The Eastern Question from the Treaty of Paris to the Treaty of Berlin and to the Second Afghan War* (2 vols., 1879); *The Reign of Law* (1866); *Primeval Man* (1869), and *The History and Antiquities of Iona* (1870). Throughout his career the Duke has been an enthusiastic student of art and literature, and has been a frequent lecturer on such topics. On the return of Mr. Gladstone to power in 1880, he took office as privy seal, but retired in 1881, since which time he has proved a severe critic of his former associates. He is hereditary master of the Queen's household in Scotland and chancellor of the University of St. Andrews. In 1844 he married the Lady Elizabeth Georgiana Gower, eldest daughter of the Duke of Sutherland. She died May 25, 1878, and in 1881 he married Amelia Maria, daughter of the Bishop of St. Albans and widow of Colonel Augustus Anson. His eldest son, George Edward Henry Douglas Sutherland, Marquis of Lorne, married the Princess Louise, daughter of Queen Victoria.



GEORGE DOUGLAS CAMPBELL, DUKE OF ARGYLL.

ARI, THORGHILSSON. See ICELAND, Vol. XII, p. 624.

ARIA (AIR), in music, a rhythmic song, as distinct from recitative. The term was formerly applied to a measured lyrical piece, either for one or several voices, but is now commonly applied to a song introduced in a cantata, oratorio or opera, and intended for one voice supported by instruments.

ARIALDUS, a deacon of the Church of Milan who flourished in the eleventh century. He took a prominent part in the ecclesiastical contentions of his times, advocated strict celibacy of the clergy, and founded the sect of Patarenes. Arialdus was murdered and his remains thrown into Lake Maggiore, June 28, 1066. He was afterward canonized.

ARIANS. See ARIUS, Vol. II, p. 538.

ARICHAT, a seaport of northeastern Nova Scotia, on Isle Madame. It has a good harbor, important fisheries, and a lead-mine is operated in the vicinity. A Catholic bishopric is located here. Population, 1,080.

ARICIA, an ancient city of Latium, on the Appian Way, near the site of modern La Riccia and the lovely Lago di Nemi. It contained a celebrated temple of Diana. Rome is 16 miles N.W. of it.

ARID REGION, in the United States, comprises Montana, Wyoming, Colorado, Utah, Nevada, Arizona, New Mexico, those parts of the Dakotas, Nebraska, Kansas and northern Texas which are west of the 100th meridian, a part of southern Texas, and large parts of Washington, Idaho, Oregon and California. Throughout this region, comprising nearly 1,350,000 square miles, artificial irrigation is essential to cultivation. Those few parts of this area which have been thus cultivated have shown remarkable producing power. The mountainous character of the region makes irrigation of large tracts practicable. The exceptional aridity of the atmosphere throughout these lands facilitates the rapid exhalation of watery vapor from the leaves of cultivated plants, and this, for plants amply supplied with moisture about the roots, is very advantageous to growth. Consequently these arid lands, artificially irrigated, are made more fertile than those whose moisture is supplied by nature. See Powell's *Lands of the Arid Region;* and IRRIGATION, in these Supplements.

ARIEL, a spirit of the air in Shakespeare's *Tempest;* a water-spirit among modern Jews; a name applied to Jerusalem; signifies Lion or Altar of God, and was used in this sense by the early Jews. See also Isa. xxix, 1.

ARIEL GAZELLE, a beautiful small antelope found in western Asia. It is a variety of the African gazelle. It is hunted for food and for its elegant fawn-colored skin. When tamed it is a much-prized domestic pet.

ARIES, the ram, one of the signs of the zodiac, including the first 30° of the ecliptic, measured from the vernal equinox. The vernal equinox is constantly changing its position among the fixed stars in consequence of the precession of the equinoxes, moving west at the rate of 50″.2 annually. It is from this circumstance that the sign Aries no longer corresponds with the constellation Aries, which was the case about 2,000 years ago, when the ecliptic was divided into 12 parts, called signs, each named after a group of stars through which it passed. The present sign Aries is in the constellation Pisces, about 30° west of the original sign; and although the sun at the vernal equinox will always be at the first point of Aries, yet nearly 24,000 years will elapse before that point will again coincide with the beginning of the constellation Aries, which now occupies the same place as the sign Taurus.

ARIKAREES. See INDIANS, Vol. XII, p. 832.

ARIL, a peculiar covering, or appendage, of the seed in some plants, developed from the funiculus, or hilum, or micropyle. In some cases it is regarded as an additional (third) integument. Examples may be seen in the yew, water-lily, passion-flower, climbing bitter-sweet (*Celastrus*), burning-bush (*Euonymus*). In the willow and milk-weed it is a tuft of hairs. In the nutmeg the aril forms what is called mace.

ARIMASPI, a fabulous people, supposed by the ancient Greeks to inhabit the most northern region of the world. They are described by Herodotus as one-eyed and fierce, engaged in perpetual conflict with the treasure-guarding griffins.

ARINOS, a river of Brazil, which from its source in the Parecis Mountains follows a northwest course of 700 miles and enters the Tapajos, which is an affluent of the Amazon.

ARION, a slug. See MOLLUSCA, Vol. XVI, pp. 660, 662.

ARIOVISTUS, an ancient German chief of the Suevi. In 72 B.C. he led an army across the Rhine, aided the Sequani in subduing the Ædui and set up a kingdom in what is now Burgundy. Cæsar defeated him with difficulty, and drove him back across the Rhine in 58 B.C.

ARISTA, MARIANO, a Mexican general; born in the state of San Luis Potosi, July 26, 1802. He distinguished himself in the successive wars that established, first the independence of Mexico, and later, the Republican form of government. In the war with the United States he commanded at Palo Alto and Resaca de la Palma, and at its close became minister of war. In 1850 he was elected president of Mexico, but resigned his position three years later, and was banished soon afterward. He died on board the English steamer *Tagus*, going from Lisbon to France, Aug. 7, 1855.

ARISTOGITON. See HARMODIUS, Vol. XI, p. 480.

ARISTOLOCHIA, a genus of dicotyledonous plants of the family *Aristolochiaceæ*. It contains numerous species, chiefly natives of warm climates, being particularly abundant in the tropical regions of South America. The plants are mostly twiners, some climbing to the tops of tall trees. The curious flowers are constructed to entrap the insects which visit them and so secure cross-pollination. Various species have had reputation as medicines. Well known American species are *A. Serpentaria*, the "Virginia snakeroot," and *A. Sipho*, the "Dutchman's-pipe."

ARISTOMENES, a general who led the Messenians in their war with the Lacedæmonians, 685–668 B.C. His heroic deeds were long perpetuated by sacrifices and songs. See Jourdan's *Histoire d'Aristomene* (1749).

ARISTOTLE'S LANTERN, the five-toothed masticating apparatus found round the beginning of the alimentary canal of some sea-urchins. The structure owes its name to its discoverer and to some fancied resemblance.

ARIZONA has an area of 113,020 square miles comprising 72,332,800 acres. The extreme breadth of the territory is 335 miles, the extreme length being 390 miles. The greater part of the surface is arid, much of the southwest portion being immense tracts of shifting sands. Many of the river valleys are quite fertile, and the table-lands, when under

irrigation, produces large crops of wheat and Indian corn, and root crops in great quantities. The number of farms in the territory in 1890 was 1,426,—an increase from 767 in 1880. The increase in the acreage of farms was from 135,573 in 1880 to 1,297,033, this gain in farm-land coming not only by the increase in the number of farms, but also through the average size having been raised from 177 acres in 1880 to the large size of 910 acres in 1890. Of the farms, scarcely nine per cent were improved, grazing constituting the chief use of the land. The northern portion of the territory is well wooded and affords fine pasturage, but the southeastern part lacks both water and timber. In the northeastern part there is an abundance of yellow pine timber, but a scarcity of water. The entire territory is drained by the Colorado River and its tributaries, the former entering across the middle of the northern boundary, and running for more than 300 miles southward along the western boundary to the Gulf of California, and is navigable for about 500 miles from its mouth. It has a total fall of more than 3,000 feet within the territory. In its course through the Grand Cañon the vertical walls rise to a height of from 4,000 to 6,000 feet, and are sections of almost horizontal strata, representing, with the smaller cañons of tributaries, all the geological formations in regular order to a depth of 25,000 feet.

The surface of Arizona is composed of broad plateaus, averaging in elevation from 80 to 100 feet above the level of the sea in the south, to 7,500 feet in the north. They are crossed by lofty mountain ranges, whose peaks tower to a height of from 12,000 to 14,000 feet, and are rent by rivers whose beds are, in some cases, 6,000 feet below the surface. The




SEAL OF THE TERRITORY OF ARIZONA.

principal ranges are the Zuñi and Mogollon in the east, the Santa Catarina and Pinaleno in the southeast, the Dragon and Santa Ana in the south, the Black and Gerbat in the west, the Gila, Black Mesa and San Francisco in the central and the Northside in the northwest. From the central mountains immense lava-beds trend northward to the Colorado Chiquito, proving the existence of volcanoes at some remote period.

The region of country now constituting New Mexico and Arizona was first explored by the Spaniards in 1526, and about 1580 they established a military post at Tucson. The early adventurers found an Indian population, consisting of the Apaches and their allies, who had undoubtedly supplanted the Aztecs or Toltecs in the possession of the country. Abundant proof of the remarkable civilization of these latter aborigines exists in the ruins of walled towns and immense communal houses, built of stone or sun-dried brick. The settlement at Tucson was soon followed by others, and before the middle of the seventeenth century the valleys of the Santa Cruz and its affluents were teeming with a busy mining and agricultural population. This Spanish civilization was short-lived, for the Indians revolted against the cruelty to which they were subjected, and the settlers were all but exterminated, the survivors being driven from the country. Ruined cathedrals and cities along the Colorado mark this abortive attempt to bring the warlike Apaches under the influences of civilization,—a task that was never accomplished. Until within recent years they remained a menace to colonization and a preventive against the settlement of the country, and it required the combined military force of both Mexico and the United States to bring about a peace, which was not accomplished until the majority of them were exterminated and the remainder confined to prisons and reservations.

The greater part of the territory was acquired by the Mexican cession to the United States, in 1848, of that portion lying south of the Gila River coming within the Gadsen purchase in 1853. Until 1863 Arizona was a part of New Mexico, becoming a territory in February of that year. On Dec. 15, 1893, the House of Representatives passed a bill admitting Arizona as a state of the Union. On reaching the Senate it was referred to the committee on territories, from which it was favorably reported in August, 1894, but no further action was taken.

The mineral deposits of Arizona constitute its greatest source of wealth. Undeveloped as its resources are, it stands fifth among the states and territories in the production of silver, and ninth in gold. The low price of silver in recent years has resulted in a decreased production, but has accelerated the output of gold. The combined value of the two metals mined in 1894 was almost $4,000,000, and during the same year 48,270,500 pounds of copper were mined. Veins and placers of gold, silver, copper and lead, and carbonates and oxides of iron, platinum and quicksilver, are widely distributed. Gold is found free in both placer and quartz lodes; silver in galena and combined with lead, and copper as sulphides and carbonates, as well as in the form of gray sulphurets. Tin, platinum and nickel are mined in a nearly pure state. Iron ores of all kinds, producing the finest qualities of iron and steel, are abundant; immense deposits of salt of the purest quality have been found; there are large beds of sulphur, gypsum, hydraulic lime, valuable mineral springs, natural lodestones of great magnetic power, opal pebbles, red, white and yellow garnets, azurite, malachite, chalcedony, sapphires, and many other rare and valuable precious stones. Both anthracite and bituminous coal have been found, giving abundant means of smelting the rich ores so widely distributed throughout the territory.

Wild animals are not abundant, with the exception of the black and cinnamon bear. Other animals of prey are the puma or cougar, the jaguar, the ocelot, wild-cat, lynx, gray wolf, raccoon, opos-

sum, skunk and one or two species of the fox. There are two species of deer, the Rocky Mountain antelope, the bighorn or mountain sheep, and the Rocky Mountain goat, with some peccaries, gophers and prairie-dogs. There were formerly many herds of mustangs, or wild horses, but these have disappeared with the advance of recent civilization. The government survey made by the Wheeler expedition was productive of much information relative to Arizona that had remained unknown up to that time. One hundred and eighty-three distinct species of birds were returned to the Smithsonian Institution, and the report of the survey made prominent the fact of the abundance of game-birds, such as partridges, pheasants, quail, grouse, sage-hens, and prairie-chickens. Eagles, vultures, buzzards and owls were found plentiful, and it was ascertained that the king-vulture, little inferior in size to the condor of the Andes or the lammergeier of Europe, made this region his only habitat in North America. Many varieties of fish peculiar to the territory are found, and the reptiles and serpents are formidable, and in some parts very numerous. Alligators inhabit the waters of the Gila and Lower Colorado, and horned toads, lizards, scorpions and centipedes flourish in the chaparral and among the cacti.

The rainfall is very scanty, the air hot and dry, the thermometer reaching a maximum of 126° in the southern portion, and remaining as high as 100° for several months at a time. At Yuma the rainfall averages between 2 and 3 inches only, at Tucson from 6 to 7 inches, and at Prescott about 10 inches. Notwithstanding the extreme heat, the air is healthful and invigorating. As a necessity, irrigation has been introduced extensively, especially along the bottom-lands of the Gila River. So far, about half a million acres have been reclaimed by this means, and it is estimated that fully a third of the entire area, or some 24,000,000 acres, is susceptible of reclamation, but the expenditure of vast capital will be necessary for the construction of adequate storage facilities, canals and laterals.

The territory now stands eighth among the states and territories in the production of sheep, the only branch of agriculture in which any rank of prominence is held. The returns of 1893 give the total number of farm and domestic animals as 1,492,891, with a total valuation of $15,830,900, and by the same means the indebtedness of the territory was shown to be $860,829, which includes the bonded and floating debt, with accrued interest. The various counties have a combined debt of $2,305,084, and the cities one of $188,811, making a total of $3,354,724.

In 1850 there were, within the area now comprising the territory, but 183 miles of railroads. In 1860 this mileage had increased to 743; in 1870 it was 1,157; in 1880 it had reached 1,843; in 1890, 3,442, and in 1892 the total railroad mileage was 3,596. The valuation of railway properties for the purpose of taxation was, at the last period mentioned, $6,039,893.

The public schools are under the supervision of a board of education, composed of the governor, territorial secretary and treasurer, assisted by county superintendents, and the system is established on a carefully constructed code. The school age is from 6 to 18 years. In 1894 there were 16,202 children within these limits, 11,252 of whom were enrolled; $176,040 were expended for the maintenance of the public schools during the year last mentioned, and in 1893–94 over $100,000 were devoted to the erection of schoolhouses in the small towns and country districts. The school-buildings are ample, comfortable and adequately furnished; and where pupils are unable to procure text-books, these are furnished free by the district. A school must be maintained for at least five months of the year in each district, to entitle the locality to participate in the distribution of the school fund, which is raised by a tax at a minimum rate of 75 cents per $100; by a poll-tax, gamblers' and liquor dealers' licenses, fines, forfeitures, penalties, etc., and distribution made by proportioning the fund among the districts, according to the number of children of school age, as ascertained by annual census. Higher education is represented by the Territorial University, which was opened at Tucson in 1891. The value of its grounds, buildings and equipment is about $100,000, and its support comes from a fund created by the sale of territorial bonds, the interest on which is met by an annual levy of $4,500, and the Agricultural College appropriation from the National Congress, which, at the present time, amounts to $20,000 annually, but which increases to the extent of $1,000 each year until it reaches the sum of $25,000. To become entitled to this latter appropriation the college gives much attention to agriculture, and by including mining in the course of instruction covers the two



CITY HALL, PHŒNIX, ARIZONA.

great industries of the territory. At Tempe, Maricopa County, the territorial normal school is maintained. It is thorough in all its appointments for educational purposes, and will compare favorably with like institutions in the states.

In addition to the Grand Cañon of the Colorado, with no equal in grandeur on the globe, Arizona possesses a petrified forest such as is found nowhere else. It is in Apache County, in the east-central part, and is estimated to cover about 10,000 acres. The forest consists of huge petrified logs, some of them six feet in diameter, and the ground is almost completely covered by trunks, limbs and branches of trees, quantities of which have been shipped to

various countries and converted to ornamental uses. The petrifactions are of all sizes and colors, and within the largest logs valuable crystals are found.

The capital of Arizona is Phœnix, situated in the south-central part of the territory, on the Salt River, a branch of the Gila, and on two lines of railway. It is a thriving city, with a population, by the census returns of 1890, of 3,152. About 125 miles southeast of Phœnix lies Tucson, the metropolis of the territory, on the Santa Cruz River and the Southern Pacific railway. Other cities of importance are Prescott, the former capital, in the west-central portion; Yuma, in the southwestern corner, on the Colorado River; Tombstone, in the southeast; Globe, Bisbee, Clifton, Morenci, Nogales, Tempe and Florence.

By the census of 1890 the 10 counties of the territory were shown to have a combined population of 59,620,—an increase over the preceding decennial census of 19,180, and over the one of 1870 of almost 50,000. The relative rank in population by this showing was forty-eighth. The native-born population, as shown by the last census, was 40,825,—an increase of more than 40 per cent in 10 years; the number of civilized Indians was 1,512,—a decrease of over 100 per cent; the Chinese numbered 1,170,—a decrease of 25 per cent; and the colored population (African descent only) amounted to 1,357,—an increase of almost 900 per cent.

Herewith is given a list of the successive governors with their terms of office.

John A. Gurley, 1862–63; John N. Goodwin, 1863–66; Richard C. McCormick, 1866–69; A. P. K. Safford, 1869–76; Charles E. G. French, 1876–77; John P. Hoyt, 1877–78; John C. Frémont, 1878–82; Frederick A. Tritle, 1882–85; C. Meyer Zulick, 1885–89; Louis Wolfley, 1889–90; John N. Irwin, 1890–92; Nathan O. Murphy, 1892–93; Louis C. Hughes, 1893.—See ARIZONA, Vol. II, pp. 538, 539.

ARKADELPHIA, the capital of Clark County, southwestern Arkansas, situated 65 miles by rail S.W. of Little Rock. It was the scene of an engagement during the Civil War, in which the Confederate troops were defeated by a force of Union soldiery commanded by Captain Brown, Feb. 15, 1863. It is the seat of Ouachita Baptist College and also of a state normal school. It is an important shipping-point for lumber and cotton, and has several manufactories of agricultural implements. Population 1880, 1,506; 1890, 2,455.

ARKANSAS is so called from the important, navigable river of that name which runs through the state diagonally from northwest to southeast. The legislature enacted a law some years ago fixing the pronunciation Ar'kansaw, but while this prevails generally within the state, it has found but little favor elsewhere. The area is 53,045 square miles, or 33,518,890 acres, divided into 75 counties. The first settlement within the boundaries of what is now Arkansas was made by the French in 1670, near the St. Francis River. The present state constituted a portion of the Louisiana purchase, bought of Napoleon I, in 1803, for $15,000,000. In 1812 Louisiana was set off as a separate state, and all the remainder of the purchase constituted the territory of Missouri. March 2, 1819, Missouri became a state, and the present state of Arkansas was made a territory, with the same name that it now bears. The territorial form of government was continued until June 15, 1836, when a convention met at Little Rock, framed a constitution, and Arkansas was admitted as a state, being the twelfth to join the original thirteen. Each decennial census thereafter up to 1860 showed the population nearly doubled. In 1861 Arkansas seceded from the Union, and during the period of the Civil War it was the scene of many important military movements, including the battles of Pea Ridge, Prairie Grove, Arkansas Post and Helena. After the close of the war Arkansas remained under military control until March 22, 1869, constituting, with Mississippi, the fourth military district.



STATE SEAL OF ARKANSAS.

The surface of the state slopes in the generally southeasterly direction of the Arkansas River, from the rich, mineral-yielding mountains in the northwest to the Mississippi on the eastern border, where the land is low, marshy and subject to frequent inundations, except where protected by artificial embankments. The interior is hilly, rising gradually from the great river-levels to the central, rolling prairies and the foothills which lead up to the Ozark, Boston and Ouachita mountains of the west.

Arkansas is remarkably well provided with navigable streams, having in excess of a total of 3,500 miles. The Mississippi extends in a tortuous course along the whole eastern border for nearly 400 miles; the Arkansas, next to the Missouri the largest affluent of the Father of Waters, is navigable for eight months of the year 800 miles from its mouth; the Red River, giving the southwestern part of the state great commercial advantages, is navigable almost the entire year; the St. Francis, more often navigable than not, affords a water highway of more than 150 miles in length; the White River, on which ply steamboats for a distance of 300 to 400 miles, extends into valuable lumber districts; the Black River is navigable for 100 miles; the Wichita or Ouachita River, for 350 miles, and many other minor streams, afford navigation for varying distances at different periods of the year, all combining to give Arkansas better transportation facilities by water than perhaps any other inland state of the Union.

There are 30,000 square miles of timberland, about one half of which is the valuable yellow pine. Heavy forests of oak, hickory, maple, black walnut, red elm, sweet and black gum, tupelo, blue and white ash, elm, yellow poplar, ironwood, hornbeam, beech, sycamore, cedar, pecan, persimmon, sassafras, buttonwood, pine, locust, wild cherry, cottonwood, butternut, mulberry, plum, dogwood, palmetto, laurel, cypress, and many other varieties of valuable

timber, cover large tracts of the fertile mountain slopes and river valleys. The forest products of the state now yield $20,000,000 annually, and large shipments are made to European ports.

Arkansas is especially rich in minerals, but the development of the mines has not been sufficiently extensive to reveal more than a small portion of her wealth in this direction. No region in the world excels Arkansas in deposits of natural marls and chalks, and within the state is the only chalk bluff in the United States from which Portland cement can be made. Deposits of zinc, 216 square miles in extent, have been found, and this mineral is now mined there in greater quantities than in any other state, except New Jersey. Gold is found in many sections, as is galena, or lead ore, frequently bearing silver. Thirteen counties are underlaid with aluminium ores, including extensive beds of bauxite. Manganese ore, in the mining of which a million and a half dollars are invested, and in the production of which Arkansas stands third among the states, is found under 126 square miles of territory. There is more gypsum than in all of the other states combined. Iron ore of excellent quality is found in the Ozark Mountains, and copper in considerable abundance has been discovered. Kaolin is found in four counties; valuable mines of nickel are numerous, and salt is plentiful and easily mined. Cannel and bituminous coal are found in some 12 counties, covering an area 12,000 square miles, and a high grade semi-anthracite variety is known to underlie about 2,300 square miles. This latter coal ranges between 1 and 9 feet in thickness, and is at a depth of 50 to 60 feet below the surface. There are extensive beds of lignite, grindstone and millstone, blue and red granite, steatite, serpentine, a fine quality of micaceous fire-clay, and the county of Carroll has extensive quarries of pink marble. This beautiful marble, and a superior quality of black marble, is found in several localities, and in addition to these there is found Tennessee marble under an area of 2,199 square miles. Arkansas ranks fourth in the production of sandstone for all purposes, and has deposits of great thickness underlying a territory of 7,000 square miles. The celebrated novaculite honestone, three times as hard as marble and much harder than steel, is found in great abundance under 305 square miles of surface. There are large deposits of tripoli, or rottenstone, used in polishing metals. An excellent quality of mineral paint is found in several counties. Shale, from which vitrified brick is made, is mined in large quantities, and the product used in many of the large cities of the Union for street-paving. Arkansas has a deposit of bauxite covering a known area of 640 acres. This valuable mineral is found nowhere else in the United States, with the exception of a single bed in Georgia.

The agricultural resources of Arkansas are being more and more developed each year. The state now ranks fifth in the amount of cotton produced, the 1893 annual report showing 691,494 bales, grown on 1,700,758 acres of land, the average yield per acre being exceeded by but one other state. Almost 40,000,000 bushels of corn were harvested in 1891, and the same year 1,500,000 bushels of wheat were grown, in addition to large yields of oats, flax, rye and rice. By the government census of 1890 it was shown that the cash value of the farm products of the state, per acre, exceeded that of any state, except Louisiana. The state reports of 1893 show a total of 3,181,748 head of farm and ranch animals, valued at $33,618,913, a prominent item of which was mules, in the production of which the state ranks ninth. Although cotton is the staple product, the crop of hay annually produced is not much inferior to it in importance. Any of the cereals grow readily, the lands of the river bottoms producing especially luxuriant crops. Tobacco is extensively raised, and by the census returns of 1890 it appears that it is grown in every county, except one, and the rank as to the number of planters is eighth. Corn, oats, Irish and sweet potatoes, rye, broom-corn, millet, and like products, are cultivated throughout the state; 375 varieties of apples were exhibited among the Arkansas products shown at the World's Columbian Exposition, as were many varieties of grapes, peaches, plums, apricots, nectarines, cherries, strawberries, melons, and other fruits. At the exhibition named the state made a very creditable showing, receiving 58 first awards. Eight of these were on fruits; and other products receiving premiums were cotton, both long and short staple, and zinc. At Vienna, Austria, a bottle of Arkansas red wine took the prize over the most prominent vintages of Europe. In California, where the finest fruits of the world are supposed to grow, Arkansas fruits have been awarded the palm of excellence at exhibitions of horticultural products. In addition to the cultivated products mentioned, wild plums, haws, persimmons, papaws, whortleberries and chinkapins grow spontaneously in profusion. Among other products of the soil are sorghum, sugar-cane, and castor beans. A very prominent industry, and one yielding large returns, is that of stock-raising and dairy-farming. Game abounds in the forests and on the prairies, including deer, bear, wild turkey, prairie-chickens and quail, and in the streams excellent fish are found in great variety and in abundance.

Manufacturing is constantly increasing, among the leading industries being the production of lumber, flour and other mill products, leather, cotton-seed oil and cake, machinery, woolen goods, etc. The commerce of Arkansas is mostly domestic, and carried on mainly by means of the Mississippi, Arkansas, and other of her navigable rivers. The exports consist of the mineral, agricultural, and manufactured products mentioned herein, and are largely in excess of her imports.

An important feature of the state, and one that has attracted attention and visitors from all parts of the United States, is the hot and medicinal springs. The most prominent of these are the celebrated Hot Springs, situated some 60 miles S.W. from Little Rock. They are visited annually by many thousands, whose aggregate expenditures there are computed at $10,000,000 yearly. The waters are strongly impregnated with carbonic acid, alkalies and carbonates, and have a temperature varying between 93° and 148°, and it is claimed that they

effect positive and permanent cures in many chronic diseases. There are many springs in different parts of the state; one in Fulton County discharges 15,000 barrels of water per hour, and is in constant action at a temperature of 60°.

In 1860 there were but 38 miles of railroad in the state; in 1880 there were 859 miles, and in 1894 the returns showed 2,442.89 miles in active operation. The railroad property of all kinds at the latter date was of an aggregate assessed value of $18,192,276, the Iron Mountain road heading the list as a corporate taxpayer, being assessed at $8,966,209.

The government census of 1890 shows the average death rate per 1000 is 1.23 less than that of the United States, and 1.95 less than that of the Northern states. The climate, though generally temperate, is subject to sudden and violent changes, from fierce north winds. The mean temperature at Little Rock is about 62°, the extremes being 15° and 99°, with an occasional lower fall. The rainfall is heavy, and thunder-storms of much violence occur in the spring and summer. Occasional cyclones visit this section, one on the evening of Oct. 2, 1894, sweeping over the city of Little Rock, lasting but three minutes, killing four persons, injuring 37 and damaging property to the amount of $1,000,000.

During the first four years of the decade 1890–1900, schoolhouses were erected at the rate of one and one quarter every day, and the state now has one for every 291 inhabitants. The enumeration of school children for 1894 was 425,349, the enrollment 67 per cent of this, and for the same year the revenue for school purposes was $1,283,715.11, the property valuation on which the school tax was levied being $175,708,834. The school system is an excellent one and is in a flourishing condition. Arkansas is educating a larger per cent of her children than Maine, New Hampshire, Connecticut, Rhode Island, Massachusetts, New York, New Jersey and Pennsylvania. During the 10 years ending with 1894, a church was built every other day, and the construction has since continued at about the same rate. The state charitable, correctional and educational institutions are all amply provided for by appropriations from state funds. The lunatic asylum, with about 425 patients, requires in excess of $150,000 annually. The penitentiary, with some 700 convicts, is now under state control. That the change from the contract system was a wise one was exemplified by the fact that the death rate among the convicts was decreased more than 50 per cent the first year. The school for the blind received for both 1893 and 1894 $30,000 for the maintenance of its 170 pupils, and the deaf-mute institute, with about 150 inmates, for the same years received a like amount. The four institutions above named are located at Little Rock, as are several others of less prominence. The Arkansas Industrial University, located at Fayetteville, received state aid in 1894 to the extent of $22,500, and during the same year the different normal schools of Arkansas were allowed in excess of $10,000.

Little Rock, the capital and largest city, is an important center of railroad and river transportation, and is the seat of St. John's College. Eureka Springs is noted for its mineral waters. Helena, the largest town in the state on the Mississippi, is an important cotton market. Hot Springs, characterized by its name, is a popular health and pleasure resort. Texarkana, situated partly in Texas, is a railroad center of growing importance. Pine Bluff is an educational and shipping town. Fort Smith is of importance for its judicial connection with the Indian Territory. Fayetteville is the seat of the Arkansas State Industrial University. Arkadelphia is noted for its excellent salt. Camden is a manufacturing town and cotton market. Batesville is the seat of Arkansas College and Batesville Academy. Prescott, Van Buren and Conway are trading centers. Other important towns are Hamburg, Dardanelle, Augusta, Searcy, Jacksonport, Arkansas City, and Judsonia, the seat of Judson University.

The population in 1870 was 484,471; in 1880, 802,525; in 1890, 1,128,179, giving the state the rank of twenty-fifth in population. The following is a list of the governors of Arkansas, with the date of the beginning of their respective terms of office:

Territorial: James Miller, 1819; George Izard; 1825; John Pope, 1829; William S. Fulton, 1835.

State: James S. Conway, 1836; Archibald Yell, 1840; Samuel Adams, 1844; Thomas S. Drew, 1844, John S. Roane, 1848; Elias N. Conway, 1852; Henry M. Rector, 1860; Harris Flanagin, 1862; Isaac Murphy, 1864; Powell Clayton, 1868; Orzo H. Hadley, 1871; Elisha Baxter, 1872; Augustus H. Garland, 1874; William R. Miller, 1877; Thomas J. Churchill, 1881; James H. Berry, 1883; Simon P. Hughes, 1885; James P. Eagle, 1889; William M. Fishback, 1893; James P. Clarke, 1895; D. W. Jones, 1896. See ARKANSAS, Vol. II, pp. 539, 540.

ARKANSAS CITY, a manufacturing town of Cowley County, southeast Kansas, situated on the Arkansas River, about 14 miles S. of Winfield, and at the junction of two railroads. It has 9 churches, 4 banks and 4 newspapers. The leading products are flour and furniture. Population 1880, 1,012; 1890, 8,437.

ARKANSAS POST, a village of Arkansas County, in the southwestern part of the state, on the Arkansas River. It was held by the Confederates during the Civil War until Jan. 11, 1863, when it was attacked by the combined Union forces under General McClernand and Admiral Porter, and carried by storm.

ARKANSAS RIVER, next to the Missouri the largest affluent of the Mississippi. It is 2,000 miles long, rising in the Rocky Mountains, on the borders of Utah, and joining the "Father of Waters" in lat. 33° 54′ N., and long. 91° 10′ W. It drains 189,000 square miles, flows generally through a level country, presents but few obstacles to navigation. The principal difficulty is connected with its periodical rise and fall, the difference between season and season being not less than 25 feet. Notwithstanding this, however, the Arkansas is navigable for steamboats during nine months of the year, to a distance of 650 miles from its mouth.

ARKANSAS STONE, a beautiful novaculite, found principally in Garland County, Arkansas. It

supplies superior honestones and oilstones for edge-tools, exists in immense beds and is easily mined.

ARKANSITE, a variety of *brookite*. See MINERALOGY, Vol. XVI, p. 387.

ARKONA, the northeast promontory of the island of Rügen, in the Baltic. Its chalk cliffs rise to a height of 177 feet and are topped with a lighthouse built in 1827, itself 78 feet high. Here stood a famous fortification (Slav. *Urkan*) long impregnable, and the temple of the Wend deity, Swantewit, the most sacred sanctuary of the Slavs of northern Germany. It was destroyed, after a long struggle, by King Waldemar I of Denmark, in 1168. The remains of the *burg-ring* or wall still stand on the land side of the promontory.

ARKOSE, a kind of feldspathic sandstone, occuring in the Lower Silurian, Carboniferous and Triassic formations. It consists essentially of consolidated quartzose sand and particles or grains of orthoclase. Also, a rock formed of crystals of disintegrated granite.

ARLBERG, a mountain mass among the western Alps, which forms the boundary between the Austrian provinces of Tyrol and Vorarlberg. The pass over this ridge, which, on the route from Bludenz to Landeck and Innsbruck, is 5,300 feet high, is one of the most difficult in the Tyrolese Alps, though it is practically the only one between the two Austrian provinces. A railway tunnel 6,720 yards in length passes through the Arlberg Alp at a height of 4,030 feet.

ARLINGTON, a village of Middlesex County, and suburb of Boston, Massachusetts; it is on the Middlesex Central railroad, 6 miles N.W. of Boston. Population 1880, 4,100; 1890, 5,629.

ARLINGTON, a post village of Alexandria County, Virginia, three miles from Washington, District of Columbia. Near it are two national cemeteries containing about 16,000 graves of soldiers. The Confederate general, Robert E. Lee, lived here. Population of district in 1880, 1,754; 1890, 2,013.

ARLINGTON, EARL OF. See BENNET, HENRY, Vol. III, p. 573.

ARM. See ANATOMY, Vol. I, pp. 826–828, 838–840.

ARMAGEDDON, the great battlefield of the Apocalypse, in which the final struggle between the powers of good and evil is to be fought (Rev. xvi, 16). Its name was undoubtedly suggested by the battlefield Megiddo (Judg. v, 19), on which some of the most important battles in the history of Israel were fought.

ARMAGNAC, BERNARD, COMTE D', constable of France, and leader of the *Armagnacs*, who fought against the Duke of Burgundy in 1407. He became constable of France in 1415, but was so tyrannical, that on June 12, 1418, a Parisian mob, followers of Burgundy, put him to death.

ARMAGNAC, JEAN V, COMTE D', was born in 1420, and put to death by royal troops, March 5, 1473. In 1465 he was allied with the League of the Public Good, in revolt against Louis XI. He led a criminal career, being excommunicated by the pope for the commission of incest.

ARMAND-DUMARESQ, CHARLES ÉDOUARD, French painter, was born at Paris, Jan. 1, 1826. He was a pupil of Couture's, and has confined himself to religious and military subjects. For his *Departure for the Crusades* he received the cross of Saint Sylvester; was made an officer of the Legion of Honor in 1881. Among his best-known works are *The Martyrdom of St. Peter; Christ; The Surrender of Yorktown; Officer of Pennsylvania Artillery*, and *The Signing of the Declaration of the Independence of the United States of America*. He died March 7, 1895.

ARMANSPERG, JOSEPH LUDWIG, COUNT OF, German statesman, was born at Kötzting, Bavaria, Feb. 28, 1787, and died in the same state, April 3, 1853. He became Bavarian minister of finance in 1826, and minister of foreign affairs in 1828. He opposed the Catholics, and by their influence was removed from office in 1831. During the minority of King Otho, he, as regent, governed Greece.

ARMATOLES, the warlike inhabitants, since the fifteenth century, of the mountain districts in northern Greece. At one time, as robbers, they ravaged the neighboring country, and later were employed by the sultan of Turkey to protect the plains from the mountain robbers of Thessaly. It has been their habit to extort blackmail from the wretched inhabitants of the northern districts.

ARMATURE. The ironclad separate-coil armature introduced in 1895 marks a distinct advance in this part of dynamo-mechanism. It is vastly more convenient than the surface-wound armature. The simple knocking out of a wedge gives complete access to the coil. This armature is built up of very thin sheet-iron toothed rings. The coils are wound in the slots between the teeth, and are held in place by simple wooden wedges driven in over the top of the winding. The armature being thus divided into a very large number of coils of comparatively few turns of wire, the voltage in the individual coils is reduced, and there is very little strain on the insulation between the coils. As a result, flashing is rare, and can do no serious damage when it does occur. This dividing of the winding into a large number of small ventilated coils avoids the accumulation of heat in the center of the coils, thereby preventing slow roasting of the insulation. It also makes it possible to rewind any coil without affecting the others in any way. The Thomson-Houston armature consists of an annular laminated iron core, carrying 30 D-shaped coils, which are slipped on, one after another. These coils are arranged in three sets of 10 coils each. On the Baltimore and Ohio electric locomotives the armature is wound on a quill which stands free from the axle proper, but is flexibly connected with it by a covering. C. H. C.

ARMENIA. For the general history and extended descriptive record, see Vol. II, pp. 546–548. War and persecution have driven the inhabitants in great numbers into Europe and different parts of Asia Minor, so that, of the 2,500,000 Armenians, it is estimated that not more than 1,000,000 are now in their native land. The record to which reference is made closes with an account of the Berlin Treaty in 1878. During the negotiation of that treaty, Great Britain entered into a secret compact with Turkey, guaranteeing to the latter the integ-

rity of her Asiatic possessions on condition that Turkey should effect reforms in their administration, and protect the Armenians from the Kurds and the Circassians. Turkey has failed, on her part. The invasion of the Kurds in 1882, under their chief Obeidullah, a vassal of Turkey, was especially destructive of life and property of the Armenians. Here is the text of the 61st article of the Berlin Treaty: "The Sublime Porte undertakes to carry out without delay the reforms and ameliorations which local requirements necessitate in the provinces inhabited by the Armenians, and to guarantee the security of the latter against the inroads and persecutions of the Circassians and the Kurds. She will at regular intervals acquaint the powers with the measures employed to this end, who will see that they are properly effectual." In August, 1890, a special commission was appointed by the Porte to inquire into the grievances of the Armenians; but from the nature of its constitution it was felt that no good could possibly come from its recommendations, and on September 21st the Armenian Patriarch resigned. This step was followed on October 15th by the issue of an order by the Œcumenical Synod closing all the orthodox Greek churches under the jurisdiction of the archbishops ruling the provinces in European Turkey,—an action which occasioned great excitement among the orthodox population. On the 21st, the difficulty was settled by the Porte deciding to maintain the privileges granted to the Patriarch by former sultans, and to further define them. But on November 28th, it was announced that the arrangements had been annulled, upon further consideration by the Porte, and that the churches would remain closed. Early in 1893, Turkish oppression driving the people again to acts of revolt, the American Christian College was held by the authorities to be responsible, 15 innocent Christians were either put to death or sentenced to long terms of imprisonment, and the lives of two Protestant professors in the college were saved only by the intervention of the powers.

The revolting atrocities of 1895 aroused indignation and protest throughout the civilized world. The most conservative and reliable estimate placed the number of Christian Armenians slaughtered in that year by the wild Kurdish soldiery at more than 5,000. The evangelistic work conducted in Armenia had aroused desire for greater religious and educational freedom, and the uprisings of the oppressed people were made the excuse for imprisoning and killing scores of innocent Christians. Conflicts between the Christians and Mohammedans occurred throughout the year without apparent intervention on the part of the Sultan. After the massacre of Trebizond, October 6th, in which several hundred Christians were slain, emphatic protests were made by Great Britain, France and Russia, to all of which the Sultan gave evasive replies. He felt secure, in the confidence that the suspicions with which Great Britain and Russia regarded each other would prevent either from taking the initiative in offering armed interference. The refusal of the Sublime Porte to permit distribution, by the Red Cross Society, of aid to the suffering Christians, except under official supervision, caused universal condemnation of the Sultan's policy.

ARMES, PHILIP, English musician and composer of church music, was born in Norwich in 1836. He has been, since 1862, organist at Durham Cathedral, and has composed many anthems and services; is best known on account of his oratorios *Hezekiah* and *St. John the Evangelist.*

ARMIDA, a beautiful sorceress in Tasso's *Jerusalem Delivered*, who so fascinated Rinaldo that he abandoned the Crusade for her charms. Finally, however, he converted her to Christianity and returned to war against the infidels.

ARMILLARY SPHERE, an instrument intended to give a just conception of the constitution of the heavens and of the motions of the heavenly bodies as seen by an observer on the earth. It consists of a number of rings fixed together so as to represent the principal circles of the celestial sphere. These are movable round the polar axis, within a meridian and horizon, as is the ordinary celestial globe. It was by means of such rings furnished with sights that Hipparchus, Ptolemy and other ancient astronomers made many of their observations. The little use which the instrument now finds is as an aid to elementary instruction in astronomy.

ARMINIANISM, that school of Protestant theology which has grown out of the teachings and position of James Arminius. (See Vol. II, p. 552, and DORT, SYNOD OF, Vol. VII, p. 374.) The "five points" of Calvinism maintained against Episcopius and his friends by the Synod of Dort were: (1) absolute election and reprobation; (2) particular redemption; (3) irresistible grace; (4) determination of the human will, so that it was not free to reject or accept divine grace; and (5) the perseverance of the saints. All of these propositions the Arminians wished modified so as to recognize the moral government of God. They would not confess that the destiny and character of human souls was predestined from eternity in a hopeless and irreversible way, but that grace came to every man, capacitating him to freely choose for faith and obedience; that he could lapse into deadly sin after regeneration, and that redemption was offered to all men. In Holland the Arminians, or Remonstrants, were supported by the aristocratic and republican party, at the head of which were Barneveldt and Grotius. The stadtholder, Maurice of Nassau, determined to overthrow his rivals by the aid of the clergy and army, with which he was highly popular, and he succeeded in having Barneveldt beheaded in May, 1619, for nonconformity to the Dort decrees, while Grotius found safety in exile. Up to this time the Church of England remained Calvinistic, although it had begun to develop its high Anglican polity, in both of which positions it was upheld by the king, James I, who hated Presbyterians as a political party, though he maintained their faith. The fierce proscription in Holland of the Remonstrants drove many of them abroad, where they propagated their views and generally found acceptance for them with the upper classes. Although the 39 Articles of the Church of England are mildly, yet distinctively, Calvinistic,

in a short time, and partly out of hatred to the Puritans and the Commonwealth, the whole High Church party had virtually accepted Arminianism, their opponents, the Low Churchmen, adhering to Calvinism until the middle of the nineteenth century.

The eighteenth century was largely one of formalism or indifferentism, and it was not until the revival set on foot by John Wesley that theology again became a faith. The Wesleyan or Methodist movement was distinctly Arminian, and it is among them that the doctrinal development on orthodox series of Christian tradition is to be most fully sought. They maintain that the doctrine of election and reprobation was not known to the primitive church, but was elaborated in the fourth century by St. Augustine of Hippo, and also that Augustinianism was not dominant through the middle ages, nor among the schoolmen, but that it came again into prominence as a phenomenon of the Protestant Reformation. At that time men's religious convictions imperiled their lives, and no faith so radically cut down the pretentions of sacerdotal authority as Calvinism. If the eternal lot of all souls was irreversibly determined in the divine mind before all worlds, then the "power of the keys" was a fiction, and sacerdotal functions an arrogance.

It is amongst the paradoxes of religious history that Calvinism, which affords a basis of aristocratic distinction in the elect and the non-elect, has usually been found on the side of liberty and democracy and fighting their battles, while, until Methodism popularized it, Arminianism has been largely favored by the privileged and prelatical classes. Since Wesleyanism, however, penetrated the lower classes of society, this school of faith has grown distinctly democratic, and claims that this is its logical nature, since it holds all souls to be subjects of divine grace, and maintains the dignity and freedom of the will.

At present Arminianism has advanced so far as to affirm the salvation of all who die in infancy, the operation of divine grace among the heathen, so that those who obey the voice of duty, although without knowledge of Christ, may be saved. It makes much of moral character, not only as the ground of obedience to and adoration of God, but as the evidence of regeneration. Generally it is an upholder of civil authority, while resisting its intrusion into spiritual matters.

In Calvinistic churches the advance in moral and humane standards, and the growth of critical study, have done much to modify the austere character of Puritan faith. Often these modifications are in the direction of Arminianism. The new theology of Yale and of Andover, and the increase of broad churchmanship, all tending away from arbitrariness of God's sovereignty to ethical grounds, have brought about a concord between their adherents and Arminianism. Yet the two movements have different roots, and must not be confounded. Modern Arminianism is orthodox, and follows Christian tradition. The broadened faith referred to is critical and reflects the skeptical tendencies of the age. With the former, plenary inspiration and the authority of confessions are not called in question; with the latter, they are at least put on probation. Yet the broad-church movement is mediatorial between the so-called orthodox schools; and, in the United States at least, there is a growing concord of sentiment in which supralapsarian Calvinism concedes much to the position taken by the Dutch Remonstrants early in the seventeenth century. D. O. K.

ARMITAGE, EDWARD, an English historical painter, was born in London, May 20, 1817, and studied in Paris under Paul Delaroche. His first essay in historical composition was *Prometheus Bound.* In 1847 his *Battle of Meanee* won him a high prize and was purchased by the Queen, who commissioned him to paint two of the frescoes in the Parliament house. He visited the Crimea during the progress of the war with Russia, making studies for pictures of the battles of *Inkerman* and *Balaklava.* He is best known in the United States by his allegorical picture of *Britannia and Columbia relieving Chicago,* a work illustrative of the great fire of 1871. He died May 24, 1896.

ARMITAGE, THOMAS, an American divine and author; born in Pontefract, England, Aug. 2, 1819. He came to the United States in 1838, and in his youth became a Methodist minister; but in 1848 he united with the Baptists and became a pastor in New York. He retired in 1888. He is the author of *A History of the Baptists,* and has been an efficient worker in the organization and conduct of the American Bible Union.

ARMITAGE, WILLIAM EDMOND, bishop of Wisconsin, was born in New York City, Sept. 6, 1830, and died there, Dec. 7, 1873. He was ordained priest, Sept. 27, 1854, and in 1870 succeeded Bishop Jackson Kemper, whose assistant he had been since 1866, in the episcopate of Wisconsin.

ARMORED SHIPS. See NAVY, in these Supplements.

ARMSTEAD, HENRY HUGH, English sculptor, was born in London, June 18, 1828. He has chased in silver the *Tennyson Vase,* the *Packington Shield,* and the *Outram Shield,* and done in silver much other work of less note. He did a large share of the work on the Albert Memorial, Hyde Park, and designed the external sculptural decorations upon the colonial offices, London. His work in design and sculpture marks many notable English edifices. He became an Academican Dec. 18, 1879.

ARMSTRONG, DAVID MAITLAND, an American artist, was born at Newburgh, New York, July 7, 1848, and graduated from Trinity College, Hartford. He has spent his professional life largely in Italy, and was for four years United States consul-general at Rome; became a member of the Legion of Honor in 1878. Among his works are *Twilight on the Tiber* and *The Column of St. Mark's, Venice.*

ARMSTRONG, GEORGE DODD, an American author; born in Mendham, New Jersey, Sept. 15, 1813. He graduated at Princeton in 1832, and studied theology at the Union Seminary, Prince Edward County, Virginia. He became professor of chemistry and mechanics at Washington and Lee University, Lexington, and in 1851 pastor of a church in Norfolk. He has published *The Christian Doc-*

*trine of Slavery* (1857); *Scriptural Examination of the Doctrine of Baptism* (1857); *The Theology of Christian Experience* (1857), and *The Books of Nature and Revelation Collated* (1886).

ARMSTRONG, GEORGE FRANCIS, Irish poet, was born in the county of Dublin, May 5, 1845. In 1871 he became professor of history and English literature in Queen's College, Cork, and upon the succeeding year received the degree of M.A. from Trinity College, Dublin, in recognition of his "high literary character and attainments." Among his best known writings are *Ugone, a Tragedy; Poems, Lyrical and Dramatic; Garland from Greece;* and *Tragedy of Israel.*—His brother, EDMUND JOHN (1841–65), a victim of ill health, published a volume of poems, of which the principal one, *Ovoca, an Idyllic Poem*, gave title to it.

ARMSTRONG, GEORGE FREDERICK, English engineer, was born at Doncaster, Yorkshire, May 15, 1842, and was graduated at Jesus College, Cambridge. In 1871, leaving a large private practice in London, he came to McGill University, Montreal, as professor of engineering. In 1876 he accepted the corresponding chair in the Yorkshire College of Science, and has been, by appointment of the crown, regius professor of engineering in the University of Edinburgh since 1885. He has lectured extensively and written many papers on general science subjects.

ARMSTRONG, JAMES, Canadian jurist, was born in Berthier, province of Quebec, April 27, 1821. He was admitted to the bar in 1844, and became queen's counsel in 1867; in 1871 he was appointed chief justice of St. Lucia, West Indies, and later of Tobago, West Indies. He returned to Canada in 1882. He has published a treatise on the law of marriage in the province of Quebec, and a treatise on the laws of intestacy in the different provinces and northwest territories of the Dominion; is president of the Montreal and Sorel railway.

ARMSTRONG, JOHN, English physician and writer on medicine, was born near Bishop-Wearmouth, May 8, 1784, and died Dec. 12, 1829. He was educated at Edinburgh, and began his practice in northern England; published, in 1816, a valuable work, *Typhus*, and in 1818 removed to London, where he established medical schools and built up an extensive practice.

ARMSTRONG, JOHN, an American soldier; born in the north of Ireland in 1725; died at Carlisle, Pennsylvania, March 9, 1795. He emigrated to America in 1745, and served with distinction in the war with France in 1755–56. He commanded a successful expedition against the Indians at Kittanning, and was commissioned as a brigadier-general in the Continental army, March 1, 1776; was present at Fort Moultrie, and commanded the Pennsylvania militia at the battles of Brandywine and Germantown. In 1778–80, and again in 1787–88, he was a member of Congress from Pennsylvania.

ARMSTRONG, JOHN, an American soldier, was born at Carlisle, Pennsylvania, Nov. 25, 1758, and died at New Haven, Connecticut, April 19, 1843. In 1775, while a student at Princeton, he enlisted in the Revolutionary army, and was appointed aide-de-camp to General Hugh Mercer, and after his death became aide to General Gates, with the rank of major, and served both in the campaign against Burgoyne and in the South. When the army was disbanded he returned to Carlisle; was made secretary of state, and later adjutant-general of Pennsylvania. In 1787 he was sent to the old Congress; was United States Senator in 1800–04, and in 1804–10 was minister to France, acting as minister to Spain after 1806. In 1812 he was commissioned brigadier-general and assigned to the district including the city and harbor of New York, and in 1813–14 was Secretary of War, but his lack of success in the operations against Canada, and the devastation of Washington City by the British in 1814, made him unpopular, and he was obliged to resign the same year. He published *Notices of the War of 1812* (1836); *Memoirs of Generals Montgomery and Wayne; Treatise on Agriculture; Treatise on Gardening; Review of General Wilkinson's Memoirs*; and *Notices of the American Revolution.* It was he who wrote the famous *Newburg Letters*, which appeared anonymously in March, 1783. These complained of the destitute condition of the American army, and urged the payment by Congress of money due the soldiers. They were considered treasonable and untimely.

ARMSTRONG, SAMUEL CHAPMAN, American educator, was born of missionary parents at Wailuka, Hawaiian Islands, Jan. 30, 1839, and died at Hampton, Virginia, May 11, 1893. Immediately after his graduation from Williams College in 1862, he entered the Union army and left it in 1865 with rank of brevet brigadier-general. From that time until his death he was principal at the Hampton Normal and Agricultural Institute, and devoted himself to the improvement of the negro race.

ARMSTRONG, WILLIAM GEORGE, BARON, English inventor, was born at Newcastle-upon-Tyne, March 23, 1810. He did not receive a university education, but early in life showed a strong bent for engineering, and while a very young man devised the hydro-electric machine for developing frictional electricity. This invention won him a fellowship in the Royal Society, and his subsequent applications of hydraulic power, and invention of the Armstrong rifled ordnance gun, caused his elevation to the knighthood in 1858. He was created a peer in the Queen's jubilee year, 1887. From 1858 until 1863 he was government engineer of rifled ordnance, and since that time has been at the head of the Elswick Manufacturing Company at Newcastle, one of the largest establishments in Europe. He has been thrice president of the Institution of Mechanical Engineers and was president of the British Association in 1863.

ARMY OF THE UNITED STATES. The theory of the government is that all able-bodied males of proper age shall constitute its army, with the President of the United States as their commander-in-chief. All such citizens are liable, in emergencies, to be called upon to do military duty; and all the officers and soldiers are at all times citizens of the country, with all the rights and privileges of the most favored civilian. The standing army, recruited by voluntary enlistment, properly began

with the organization of the War Department, Dec. 7, 1789. In 1790 it numbered 1,200 men; in 1791 it was increased to 2,100 men. In 1798 a provisional standing force of 10,000 men was authorized, in view of a war with France, and the next year a provisional increase to the number of 40,000 regulars and as many volunteers was authorized. A fraction of this increase was made, but the danger of war happily passed away, and in 1802 the number was fixed at about the old figure, viz., 10,000 men.

During the War of 1812 the army was increased, and a force of 25,000 regulars and 50,000 volunteers was authorized. At the close of the war with England, 1815, the army was reorganized on a peace footing, the force then consisting of 10,000, exclusive of its engineer department. In 1821 the army was again reduced. During the Florida War, lasting from 1835 to 1842, there was another increase, both of regulars and militia.

At the beginning of the war with Mexico (May, 1846) the army was 7,244 strong, General Taylor having with him in Texas 3,554 men. During the progress of this war 29,000 regulars were enlisted and 50,000 volunteers were employed. At the close of hostilities the volunteers disbanded and the regular force was reduced to its previous strength.

At the breaking out of late Civil War, the legal strength of the regular army was 12,000 men. The first levy for the Union army (dated April 15, 1861) was made for 75,000 men, and was composed of militia organizations from the states. That year the army was increased to 186,000; in 1862, to 637,000; in 1863, to 918,000, and by 1865, to more than 1,000,000. The actual arrivals on the field amounted to 1,135,416 men, of which there were in the regular army 43,014. After the close of the war, the act of July 28, 1866, fixed the rank and file at 75,382; but by successive and speedy reductions its strength was brought down to 2,153 commissioned officers and 25,000 men.

At present (1896) the army consists of 25 regiments of infantry, 10 of cavalry, and 5 of artillery, —a total force of 25,000 men. Each regiment includes 10 companies, each officered by a captain, 1 first and 1 second lieutenant, and 2 extra lieutenants, who are the adjutant and quartermaster of the regiment. These, with the colonel, lieutenant-colonel and major, complete the officers of an infantry regiment.

The cavalry regiment consists of 12 troops, or mounted companies, with 3 officers to the troop, 1 captain, 1 first and 1 second lieutenant, and has 3 majors instead of 1. In the artillery the regiment contains 12 companies, or batteries, each being officered by 1 captain, 2 first lieutenants, and 1 second lieutenant. Consequently, in the artillery regiment there are 26 first lieutenants, allowing 2 for each company and 1 each as adjutant and quartermaster. The field officers consist of a colonel, lieutenant-colonel, and three majors.

In each regiment of artillery there are two horse-batteries, the officers of which are changed from time to time with the officers of foot-batteries, so that all may be instructed in this important part of the artillery officer's duties. The other batteries, or companies, are foot-troops, instructed both as infantry soldiers and in the handling of heavy guns in the permanent forts.

## UNITED STATES ARMY PAY-TABLE.—OFFICIAL REPORT.

| GRADE. | PAY OF OFFICERS IN ACTIVE SERVICE.* | | | | | | PAY OF RETIRED OFFICERS.* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pay of Grade. | | Monthly Pay. | | | | Pay of Grade. | | Monthly Pay. | | | |
| | Yearly. | Monthly. | After 5 years' service. | After 10 years' service. | After 15 years' service. | After 20 years' service. | Yearly. | Monthly. | After 5 years' service. | After 10 years' service. | After 15 years' service. | After 20 years' service. |
| | | | 10% | 20% | 30% | 40% | | | | | | |
| General (retired) | | | | | | | †$13,500 00 | $1,125 00 | | | | |
| Major-general | $7,500 00 | $625 00 | | | | | 5,625 00 | 468 75 | | | | |
| Brigadier-general | 5,500 00 | 458 33 | | | | | 4,125 00 | 343 75 | | | | |
| Colonel | 3,500 00 | 291 67 | $320 83 | $350 00 | ‡$375 00 | $375 00 | 2,625 00 | 218 75 | $240 62 | $262 50 | $281 25 | $281 25 |
| Lieutenant-colonel | 3,000 00 | 250 00 | 275 00 | 300 00 | 325 00 | §333 33 | 2,250 00 | 187 50 | 206 25 | 225 00 | 243 75 | 250 00 |
| Major | 2,500 00 | 208 33 | 229 17 | 250 00 | 270 83 | 291 67 | 1,875 00 | 156 25 | 171 87 | 187 50 | 203 12 | 218 75 |
| Captain, mounted | 2,000 00 | 166 67 | 183 33 | 200 00 | 216 67 | 233 33 | 1,500 00 | 125 00 | 137 50 | 150 00 | 162 50 | 175 00 |
| Captain, not mounted | 1,800 00 | 150 00 | 165 00 | 180 00 | 195 00 | 210 00 | 1,350 00 | 112 50 | 123 75 | 135 00 | 146 25 | 157 50 |
| Regimental adjutant | 1,800 00 | 150 00 | 165 00 | 180 00 | 195 00 | 210 00 | | | | | | |
| Regimental quartermaster | 1,800 00 | 150 00 | 165 00 | 180 00 | 195 00 | 210 00 | | | | | | |
| First lieutenant, mounted | 1,600 00 | 133 33 | 146 67 | 160 00 | 173 33 | 186 67 | 1,200 00 | 100 00 | 110 00 | 120 00 | 130 00 | 140 00 |
| First lieutenant, not mounted | 1,500 00 | 125 00 | 137 50 | 150 00 | 162 50 | 175 00 | 1,125 00 | 93 75 | 103 12 | 112 50 | 121 87 | 131 25 |
| Second lieutenant, mounted | 1,500 00 | 125 00 | 137 50 | 150 00 | 162 50 | 175 00 | 1,125 00 | 93 75 | 103 12 | 112 50 | 121 87 | 131 25 |
| Second lieutenant, not mounted | 1,400 00 | 116 67 | 128 33 | 140 00 | 151 67 | 163 33 | 1,050 00 | 87 50 | 96 25 | 105 00 | 113 75 | 122 50 |
| Chaplain | 1,500 00 | 125 00 | 137 50 | 150 00 | 162 50 | 175 00 | 1,350 00 | 112 50 | 123 75 | 135 00 | 146 25 | 157 50 |

* For law establishing the present rates of pay, see sections 1261, 1262, 1263 and 1274, Revised Statutes.

† The General of the Army, when retired, shall be retired without reduction in his current pay and allowances.—*Act June 30, 1882.*

‡ The maximum pay of a colonel is by law $4,500 per annum.—Section 1267, Revised Statutes.

§ The maximum pay of a lieutenant-colonel is by law $4,000 per annum.—Section 1267, Revised Statutes.

## PAY OF ENLISTED MEN OF THE ARMY, ETC.

| | First Enlistment. | | | | | First Re-enlistment.*—$2 extra. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year in each enlistment | First year. | Second year. | Third year. | Fourth year. | Fifth year. | First year. | Second year. | Third year. | Fourth year. | Fifth year. |
| Year of total continuous service | First year. | Second year. | Third year. | Fourth year. | Fifth year. | Sixth year. | Seventh year. | Eighth year. | Ninth year. | Tenth year. |
| | Retain nothing. | Retain nothing. | Retain $1 | Retain $2 | Retain $3 | Retain $1 | Retain $1 | Retain $1 | Retain $1 | Retain $1 |
| RANK AND SERVICE. | | | | | | | | | | |
| *Company.* | | | | | | | | | | |
| Private—artillery, cavalry and infantry; Private (second class)—engineers, ordnance and signal corps; Musician—engineers, artillery and infantry; Trumpeter—cavalry | $13 00 | $13 00 | $14 00 | $15 00 | $16 00† | $18 00 | $18 00 | $18 00 | $18 00 | $18 00 |
| Wagoner‡—artillery, cavalry and infantry | 14 00 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Artificer‡—artillery and infantry | 15 00 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Corporal—artillery, cavalry and infantry; Blacksmith and farrier—cavalry; Saddler—cavalry | 15 00 | 15 00 | 16 00 | 17 00 | 18 00 | 20 00 | 20 00 | 20 00 | 20 00 | 20 00 |
| Sergeant—artillery, cavalry and infantry; Private (first class)—engineers, ordnance and signal corps | 17 00 | 17 00 | 18 00 | 19 00 | 20 00 | 22 00 | 22 00 | 22 00 | 22 00 | 22 00 |
| Corporal—engineers, ordnance and signal corps | 20 00 | 20 00 | 21 00 | 22 00 | 23 00 | 25 00 | 25 00 | 25 00 | 25 00 | 25 00 |
| First sergeant—artillery, cavalry and infantry | 22 00 | 22 00 | 23 00 | 24 00 | 25 00 | 27 00 | 27 00 | 27 00 | 27 00 | 27 00 |
| Sergeant—engineers, ordnance and signal corps | 34 00 | 34 00 | 35 00 | 36 00 | 37 00 | 39 00 | 39 00 | 39 00 | 39 00 | 39 00 |
| *Regiment.* | | | | | | | | | | |
| Chief trumpeter—cavalry; Principal musician—artillery and infantry; Saddler-sergeant—cavalry | 22 00 | 22 00 | 23 00 | 24 00 | 25 00 | 27 00 | 27 00 | 27 00 | 27 00 | 27 00 |
| Chief musician‡—artillery, cavalry and infantry | 60 00 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Sergeant-major—artillery, cavalry and infantry; Quartermaster-sergeant—artillery, cavalry and infantry | 23 00 | 23 00 | 24 00 | 25 00 | 26 00 | 28 00 | 28 00 | 28 00 | 28 00 | 28 00 |
| Sergeant-major and quartermaster-sergeant—engineers | 36 00 | 36 00 | 37 00 | 38 00 | 39 00 | 41 00 | 41 00 | 41 00 | 41 00 | 41 00 |
| *Post.* | | | | | | | | | | |
| Ordnance sergeant; Commissary sergeant; Post-quartermaster sergeant | 34 00 | 34 00 | 35 00 | 36 00 | 37 00 | 39 00 | 39 00 | 39 00 | 39 00 | 39 00 |
| *Hospital Corps.* ‖ | | | | | | | | | | |
| Hospital steward | 45 00 | 45 00 | 46 00 | 47 00 | 48 00 | 50 00 | 50 00 | 50 00 | 50 00 | 50 00 |
| Acting hospital steward | 25 00 | 25 00 | 26 00 | 27 00 | 28 00 | 30 00 | 30 00 | 30 00 | 30 00 | 30 00 |
| Private | 13 00 | 13 00 | 14 00 | 15 00 | 16 00 | 18 00 | 18 00 | 18 00 | 18 00 | 18 00 |
| Veterinary surgeon § (senior) | 100 00 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Veterinary surgeon (junior) | 75 00 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Hospital matron | 10 00 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |

*Pay of General-Service Clerks and Messengers.* ¶

General-service clerk, class 1.....$1,000 per annum.
General-service clerk, class 2..... 1,100 per annum.
General-service clerk, class 3.....$1,200 per annum.
General-service messenger.....$60 per month.

*Subsequent re-enlistments, $1 more.

† The pay of a man who has *ever* re-enlisted under the act of August 4, 1854, and who comes into the service again, commences with amount stated in this column; $1 per month to be retained.

‡ Not affected by act of May 15, 1872. No pay retained in these cases; but they are entitled to benefits of act of Aug. 4, 1854, for re-enlistment.

‖ Enlisted men of this corps are entitled to increased pay for length of service, the same as other enlisted men. Hospital stewards rank with ordnance sergeants, and are entitled to all the allowances of that grade; acting hospital stewards to be detailed from privates of the hospital corps; privates of the hospital corps are entitled to the allowances of a corporal of the arm of service with which they are on duty. —*Act March 1, 1887; G. O. 29, A.G. O., 1887.*

§ Only one veterinary surgeon, at $75 per month, allowed each of the cavalry regiments, from the First to the Sixth regiment, inclusive; two, one at $100 and one at $75 per month, allowed each of the Seventh, Eighth, Ninth and Tenth regiments; the senior in date of appointment entitled to the higher grade.—*Decision of Adjutant-General of Dec. 3, 1874.*

¶ General-service clerks and messengers are not entitled to any additional pay on account of continuous service, nor for a certificate of merit. For the purposes of retirement, they rank as follows: Class 3, with first sergeants of the line; class 2, with sergeants of the line; class 1, with corporals of the line; messengers, with privates of the line.—*Act July 29, 1886; G. O. 54, A.G O., 1886.*

The maximum military force allowed under existing laws is 2,155 commissioned officers and 25,000 enlisted men. The report of the lieutenant-general of the army exhibits the actual number in service as 2,189 officers and 23,208 enlisted men. The following exhibits the number in each rank of the army:

1. Commissioned officers: Colonels, 70; lieutenant-colonels, 91; majors, 226; captains, 616; adjutants, 40; regimental quartermasters, 40; first lieutenants, 563; second lieutenants, 459; chaplains, 34.

2. The enlisted men embrace 40 sergeant-majors, 40 quartermaster sergeants, 728 musicians, 234 trumpeters, 9 saddler sergeants, 89 ordnance sergeants, 139 hospital stewards, 124 commissary sergeants, 426 first sergeants, 2,172 sergeants, 1,774 corporals, 218 farriers, 141 artificers, 117 saddlers, 102 wagoners, and 16,487 privates. Besides these, there are employed in the signal corps 433 non-commissioned officers and privates; Military Academy, 61 officers and 292 cadets.

GENERALS OF THE ARMY. The following is a list of generals who have commanded the army since 1775, with the dates of command as far as can be ascertained from the official records:

Major-General George Washington, June 15, 1775, to Dec. 23, 1783. Died 1799.

Major-General Henry Knox, Dec. 23, 1783, to June 20, 1784. Died 1806.

Lieutenant-Colonel Josiah Harmer, general-in-chief by brevet, September, 1788, to March, 1791. Died 1813.

Major-General Arthur St. Clair, March 4, 1791, to March, 1792. Died 1818.

Major-General Anthony Wayne, April 11, 1792, to Dec. 15, 1796. Died 1796.

Major-General James Wilkinson, Dec. 15, 1796, to July, 1798. Died 1825.

Lieutenant-General George Washington, July 3, 1798, to his death. Died 1799.

Major-General James Wilkinson, June, 1800, to January, 1812. Died 1825.

Major-General Henry Dearborn, Jan. 27, 1812, to June, 1815. Died 1829.

Major-General Jacob Brown, June, 1815, to Feb. 21, 1828. Died 1828.

Major-General Alexander Macomb, May 24, 1828, to June, 1841. Died 1841.

Major-General Winfield Scott (brevet lieutenant-general), June, 1841, to Nov. 1, 1861. Died 1866.

Major-General George B. McClellan, Nov. 1, 1861, to March 11, 1862. Died 1885.

Major-General Henry W. Halleck, July 11, 1862, to March 12, 1864. Died 1872.

Lieutenant-General Ulysses S. Grant, March 12, 1864, to July 25, 1866, and as general to March 4, 1869. Died 1885.

General William T. Sherman, March 4, 1869, to Nov. 1, 1883. Died 1891.

Lieutenant-General Philip H. Sheridan, Nov. 1, 1883, to Aug. 5, 1888. Died 1888.

Lieutenant-General John M. Schofield, Aug. 14, 1888, to Sept. 29, 1895.

Major-General Nelson A. Miles, from Oct. 2, 1895.

PRESENT ACTIVE OFFICERS OF THE SERVICE.

Nelson A. Miles, Major-General, commanding.

*Major-Generals.*

Nelson A. Miles, United States Army, Washington, District of Columbia.

Thomas H. Ruger, Department of the East, Governor's Island, New York.

Wesley Merritt, Department of the Missouri, Chicago, Illinois.

*Brigadier-Generals.*

Adolphus W. Greely, Chief Signal-Officer, Washington, District of Columbia.

John R. Brooke, Department of Dakota, St. Paul, Minnesota.

J. C. Breckinridge, Inspector-General, Washington, District of Columbia.

Richard N. Batchelder, Quartermaster-General Washington, District of Columbia.

Daniel W. Flagler, Chief of Ordnance, Washington, District of Columbia.

Frank Wheaton, Department of the Colorado, Denver, Colorado.

George M. Sternberg, Surgeon-General, Washington, District of Columbia.

George D. Ruggles, Adjutant-General, Washington, District of Columbia.

Elwell S. Otis, Department of the Columbia, Vancouver Barracks, Washington.

Michael R. Morgan, Commissary-General, Washington, District of Columbia.

James W. Forsyth, Department of California, San Francisco, California.

Guido N. Lieber, Judge-Advocate-General, Washington, District of Columbia.

Thaddeus H. Stanton, Paymaster-General, Washson, District of Columbia.

Zenas R. Bliss, Department of Texas, San Antonio, Texas.

John J. Coppinger, Department of the Platte, Omaha, Nebraska.

William P. Craighill, Chief of Engineers, Washington, District of Columbia.

See also MILITARY ACADEMY, and WAR, DEPARTMENT OF, in these Supplements, and ARMY, Vol. II, p. 619.

ARMY-LIST, an official publication issued by the British War-Office. It contains the names of the commissioned officers of the army, and an enumeration of the regiments and of the officers attached to each.

ARMY REGISTER, THE, is published annually by the Secretary of War, in accordance with an act of Congress. It contains lists of the departments, regiments, and commissioned officers, and of the casualties, promotions, deaths, etc., of the United States army.

ARMY REGULATIONS, a volume issued by the United States War Department, containing the rules as prescribed by the Articles of War, and other acts of Congress for the management of the army in field and camp. It gives instructions for making official returns to the army bureaus and prescribes all other duties of military routine.

ARMY-WORM, the larva of a night-flying moth

(*Leucania unipuncta*). The perfect insect is plain and unadorned in appearance, of a yellowish drab color, with a white spot in the center of its fore wings, and it has a spread of wings of 1¾ inches. The eggs are laid in the spring of the year, between the folded sides of grass-blades, and glued along the creases with a white, glistening and adhesive fluid, which draws the two sides of the blades close around them. The worms hatch out in 10 days. They are dark gray, with three narrow yellowish stripes above and a broader one on each side. When fully grown the army-worm measures from 1¾ to 2 inches, and is about as thick as a goose-quill. Its chrysalis is of a mahogany-brown color, ¾ inch in length, and tipped at the end with a short spine.

Sometimes army-worms become very numerous and destructive. This occurs at the time when winter wheat is in the milk, and again in August. The easiest way to arrest their ravages is by plowing a double furrow around the field. This furrow must be deep and have the steep side next to the unharmed crop. A ditch with the side toward a field perpendicular is still better. When the worms are collected in the ditch they are covered with straw and burned.

ARNALDUS VILLANOVANUS. See ARNAUD, Vol. II, p. 620.

ARNAOUTS, ARNAUTS OR ARNAOOTS. See ALBANIA, Vol. I, p. 447; EGYPT, Vol. VII, pp. 760–762.

ARNASON, JÓN, an Icelandic writer, was born at Hof, Aug. 17, 1819, and died at Reykjavik, Nov. 13, 1888. He was educated at the college of Bessestad, at that time the only school in Iceland. He took rank as a thorough student of the history and literature of his country, and in 1849 was made custodian of the national library in Reykjavik; published a number of sketches and a volume of folk-tales, but is best known through his collection of Icelandic nursery tales, *Islenzhar Thjódsögur og Æfintyri* (2 vols., 1862–64).

ARNAUD, ARSÈNE. See CLARETIE, JULES, in these Supplements.

ARNAULD, ANTOINE, the greatest advocate of his time in France, was born at Paris in 1560, and died there, Dec. 29, 1619. He was descended from an ancient family of Auvergne, which had distinguished itself both in civil and military affairs, and he became, in 1585, procureur-général. He published a work against the Jesuits, and his famous speech of 1594 caused their temporary banishment. He had four distinguished sons, who attached themselves to the Jansenists and Port Royalists.

ARNAULD, ROBERT D'ANDILLY, French writer, the eldest son of Antoine Arnauld, the advocate, and the brother of "Le Grand Arnauld," was born at Paris in 1588, and died there, Sept. 27, 1674. He was a person of considerable consequence at the French court, where his influence was ever exerted beneficially. His chief works are translations, as of the *Confessions of St. Augustine*, and the *History of the Jews* by Josephus.

ARNAULT, VINCENT ANTOINE, French dramatic poet, secretary-general of the Parisian University and perpetual secretary of the French Academy, was born in Paris, Jan. 1, 1766, and died at Goderville, Sept. 16, 1834. His tragedies, *Lucretia; Germanicus*; and *Marius at Minturnæ*, are his best-known works.

ARNHEIM. Same as ARNIM.

ARNIM, HARRY KARL KURT EDUARD, COUNT VON, was born at Moitzelfitz, Pomerania, Oct. 3, 1824, and died at Nice, May 19, 1881. He was Prussian ambassador at Rome from 1864 to 1870, and strongly advocated the cause of the anti-infallibilists during the Vatican Council. He was rewarded with the title of Graf, but as German ambassador to France (1872–74) he incurred Prince Bismarck's disfavor and was prosecuted on the charge of purloining state documents. After his voluntary retirement into exile in 1874, he was sentenced to five years' imprisonment, but had removed beyond the jurisdiction of the German courts.

ARNOLD, SIR ARTHUR, English author, was born at Maidstone, May 28, 1833. In 1863 he was appointed assistant commissioner under the Public Works Act, and resided in Lancashire till the end of the cotton famine in 1866. He subsequently spent two years in traveling in southeastern Europe and Africa, and on his return to England in 1868, published a description of his tour under the title *From the Levant*. For this work the king of Greece bestowed upon him the cross of the Order of the Redeemer. He has been very successful as editor of *The Echo*, a Liberal journal. In 1880 he was elected member of Parliament from Salford. Among his earlier works are two novels, *Ralph, or St. Sepulchre's and St. Stephen's*, and *Hever Court*. He published *Social Politics* in 1878, and *Free Land* in 1880. He was elected chairman of the London county council in 1895, and was knighted in June of that year.

ARNOLD, BENEDICT, born in Norwich, Connecticut, Jan. 14, 1741; died in London, England, June 14, 1801. He had a common-school education, with some knowledge of the higher branches. At first he was an apprentice in a drug store in his native place; afterward he went to New Haven and successfully conducted a book and drug store, extending his connections to Canada and the West Indies. He made a business visit to Honduras, where he fought a duel with an English sea-captain, provoked by the captain's severe reflections on the natives of New England. On Feb. 27, 1767, he married Miss Margaret Mansfield, by whom he had three sons. At the time of the battle of Lexington, Arnold was captain of the governor's guards, nearly all of whom volunteered to join in the fight at Boston. Soon afterward he was sent by Massachusetts to lead an expedition for the capture of Crown Point and Ticonderoga, and on his way thither met Colonel Ethan Allen with a company of soldiers devoted to the same purpose. Allen took the lead, to which he was



BENEDICT ARNOLD.

entitled, and captured Ticonderoga on May 10, 1775. Four days later Arnold captured St. John's. On September 11th of the same year Washington dispatched Colonel Arnold with 1,100 men through the wilderness of Maine to assist in capturing Quebec. After enduring incessant hardships Arnold and his men arrived opposite Quebec, and on December 13th climbed to the Plains of Abraham. On December 31st he was joined by the corps under the command of General Montgomery, and a combined attack was made on the city. The American army was defeated, Montgomery killed, and Arnold's leg seriously fractured. For his gallantry and skill Congress promoted him to the rank of brigadier-general. On October 11, 1776, he fought a naval battle with a superior force of the British under Sir Guy Carleton, during which he ran his own vessel ashore, burnt her, and with his other ships and men safely retreated to Ticonderoga. On February 19, 1777, Congress appointed five major-generals for the army, none of whom had signalized themselves as soldiers, and all of whom were juniors of Arnold. The latter was stung by this injustice, and Washington wrote to assure him that he would endeavor to remedy "the error." In April, 1777, he learned of the invasion of Connecticut by Governor Tryon, of New York, when he at once gathered about 500 volunteers, and made a heroic resistance at Ridgefield, during which several horses were killed under him, and a bullet went through his coat. On presenting his claims for advancement in rank, Congress voted him a horse and thanks, but did not accede to his request for promotion. He then forwarded to that body his resignation, which was not accepted. At that time General Burgoyne was advancing from Canada with his British troops, apparently carrying all before him, and Washington urged Congress to send Arnold north at once, to stay the enemy's advance. Arnold consented to serve anew, saying he would "trust to the justice of his claims for future reparation." He joined the army of General Philip Schuyler, and volunteered to lead an expedition to relieve Fort Stanwix, then besieged by a force of British and Indians under St. Leger. This done, he returned to the main army, and in the first battle of Bemis Heights, Oct. 19, 1777, commanded the left wing of the army. At that time differences arose between General Gates and General Arnold, and the latter asked and obtained permission from Gates to join Washington. He did not leave, however, and was not restored to his command. During the battle of October 7th, without authority he led several attacks against the enemy at the head of the troops he lately commanded, during which his horse was shot under him, and a musket-ball shattered his thigh. Congress now sent, through General Washington, his commission as major-general, antedating it so as to confer the rank to which he was justly entitled. In June, 1778, he was appointed to the command of Philadelphia. Here he became involved in quarrels with Joseph Reed and the state authorities of Pennsylvania. Their charges subjected him to trial by courtmartial. He was acquitted of intentional wrong-doing, but on some charges his conduct was declared "imprudent and improper"; the sentence was that he should receive a reprimand from the commander-in-chief. Washington discharged this duty with consideration, and assured him of his continued esteem and the high estimate he placed on his services. Arnold's first wife had died during his campaign in Canada; in Philadelphia he married Miss Margaret Shippen, a daughter of Chief Justice Shippen of Pennsylvania. Through this marriage he was brought into companionship with several distinguished Tory families, and a treacherous correspondence was opened with Sir Henry Clinton. On July 31, 1780, Arnold visited the camp of Washington, and was tendered the command of the left wing of the army. But he declined, on the pretense of inability to perform service in the field, as he had not recovered from the wound received at Saratoga. Instead, he desired the command at West Point, on which he entered in August, 1780. His quarters were at the country seat of Colonel Beverly Robinson, a Virginia Loyalist, and a friend of Sir Henry Clinton. When Arnold's treachery had become manifest through the capture of Major André, he found a refuge among the British in New York City, and was compensated for his treason with a British brigadier-general's commission and a small sum of money. Early in 1781, acting as a Loyalist, he led a raid into Virginia, and in September of that year made an attack on New London. In the following winter he and his wife went to London; in 1787 he settled in St. John, New Brunswick, where he and two of his sons founded a mercantile business. In 1791 he permanently retired to London. In 1797 the British government gave him a grant of 13,400 acres of land in Canada. By his second wife he left four sons and one daughter. All his sons received commissions in the British army; one of them rose to distinction. His *Life* has been written by Jared Sparks and by Isaac N. Arnold (Chicago, 1880). The latter tried not so much to extenuate Benedict Arnold's treason, but by bringing out in high relief his distinguished early services to show the better side of his character. But Arnold was despised even by the British, who would have profited had his treason been successful, and died in obscurity.

ARNOLD, Sir Edwin, an English journalist and poet, was born at Rochester, June 10, 1832. He graduated at Oxford University in 1854, with honors, and was afterward appointed principal of the Government Sanskrit College at Poona, Bombay Presidency, India. This appointment gave him an excellent opportunity of studying Oriental languages and literature, upon which he founded his after fame. He returned to England in 1861, and seeing an advertisement in the *Daily Telegraph* for an editorial writer, he applied and was engaged on the staff of that journal. In his new sphere he speedily obtained advancement, and he had the arrangement of the famous Assyrian exploration expedition sent by the *Telegraph* under the direction of the late George Smith of the British Museum, whose discoveries at Nineveh opened up a new chapter in archæological study. Mr. Arnold also arranged the Stanley expedition to complete Livingstone's work in South

Africa, which was organized by the *Telegraph* in conjunction with the *New York Herald*. Mr. Arnold has produced many works of literary merit, but it is as a poet, chiefly of Oriental subjects, that he is best known. In 1879 appeared his *Light of Asia*, an epic dealing with the life and teachings of Buddha, which work has passed through 60 English and 80 American editions, and has been set to music by Dudley Buck. His other works include *The Indian Song of Songs* (1881); *Pearls of Faith, or Islam's Rosary* (1887); *With Sa'di in the Garden* (1888); *The Light of the World*, whose theme is Jesus (1891); *Potiphar's Wife;* and *Adzuma* a Japanese subject (1893); *Wandering Words* (1894). Upon the proclamation of Queen Victoria as Empress of India, Mr. Arnold was named a companion of the Star of India; in 1888 was created a knight commander of the Indian Empire. He has received decorations from the rulers of Japan, Siam, Persia and Turkey. In 1889 he lectured in the United States, and again in 1891, on his return from Japan. He represented the London *Daily Telegraph* at the coronation of the Czar of Russia, May, 1896.

ARNOLD, FRIEDRICH, a German anatomist and physiologist; born at Edenkoben, in Bavaria, Jan. 8, 1803. He graduated in the medical faculty at Heidelberg in 1825, becoming there assistant professor in 1834. In the following year he was appointed director of the Anatomical Institute at Zurich, which position he held for four years, after which he was successively professor of anatomy and physiology at the universities of Freiburg, Tübingen and Heidelberg. He published several works treating on the sympathetic nervous system, its anatomy and physiology, and on the breathing-apparatus.

ARNOLD, GOTTFRIED, a German theologian and church historian; born in Annaberg, Saxony, Sept. 5, 1666. From 1700 to 1705 he was court chaplain at Allstedt, and at this time became noted for his work, *Impartial History of the Church*, which was written upon the principle of dealing with all religious sects independently of the view held in regard to them by the father church. He was the first German author to use that language in literary publications. He died at Perleberg, Prussia, May 30, 1714.

ARNOLD, JOHN, a watchmaker. He was an improver of the expansion-balance detached escapement, the compensation-balance and the cylindrical balance-spring of the chronometer. He was born at Cornwall, England, in 1744, and died in 1799.

ARNOLD, LAUREN BRIGGS, an American dairyman; born at Fairfield, New York, Aug. 13, 1814. He became prominently identified in originating and putting into practice improved methods in dairying and cheese-making. He lectured upon these matters; was the author of a standard work, *American Dairying*, and was appointed lecturer upon dairy-husbandry at Cornell. He died at Rochester, New York, March 7, 1888.

ARNOLD, MATTHEW, one of the foremost of recent English poets, the Sainte-Beuve of English critics, the "Apostle of Culture," and the son of Dr. Thomas Arnold, head master at Rugby. He was born at Laleham, near Staines, Dec. 24, 1822, and received his education at Winchester, Rugby and Balliol College, Oxford. At Rugby, while in his seventeenth year, he won a prize with a poem on *Alaric at Rome;* the same year being elected to a scholarship in Balliol College (1840). Three years later he won the Newdigate prize with a poem on *Cromwell*, and the next year he graduated with honors, and was elected a fellow of Oriel College (1845). In 1847 he became private secretary to Lord Lansdowne, then lord-president of the council. Upon his marriage in 1851, he was appointed an inspector of schools, which position he held until 1866, when he resigned. During this period he made frequent visits to the Continent, and published valuable and suggestive reports, in the form of blue-books, on education in his native country and in France, Germany and Holland.



MATTHEW ARNOLD.

In 1854 he published a collection of new and old poems, which established his reputation as a poet of chaste and classic power. Thus the way was clear for his selection as professor of poetry in Oxford University in 1857, which he held two terms, resigning in 1867, declining re-election. In these years he published *Merope*, constructed upon a Greek model, but which exhibited his one defect, lack of dramatic power, consequently it was not a success (1858). Then followed *Lectures on Translating Homer* (1861); *Essays on Criticism* (1865); and *Lectures on the Study of Celtic Literature* (1867).

His verses have the statuesque placidity of an antique sculptor's art, their precision and delicacy embodying a frigid severity, his style being characterized throughout with this inherent faultlessness: he was the poet of form. His earnest personality was no less evident in his criticisms, which are artistic models, breathing the "sweetness and light" with which he ever sought to vivify them. His literary judgments and his literary manner, as a creator and as a critic, as he strove to be himself and as he strove to see others, were no less eagerly studied than they were kept before the mind as standards to be imitated, if not approached, by his contemporaries in letters.

Arnold's style was always fresh, interesting, attractive. There was always some new epigram, aphorism or pungent characterization to admire. He made, too, a virtue of repetition, which in his hands became an aiding charm. He enriched the literary phraseology of his time more, perhaps, than any other writer, though the most famous one associated with his name, "sweetness and light," he himself borrowed from Dean Swift. He coined the term *Philistinism*, which he applied to the sordid instincts, blind prejudices, dullness and vacuity which he discovered in the English middle classes. To overcome these failings in his countrymen was his self-appointed mission, which he believed required the instillation and absorption of the refining

influences to be derived from a closer association with art and literature.

Throughout his works he was skeptical, unsettled, discontented. He believed he had expressed the essential teaching of the Bible when he had conceived of it aphoristically as an eternal "power, not of ourselves, which makes for righteousness"; and righteousness he seems to have conceived of as a passionless approximation to an ideal existence of elevated and beautiful "sweet reasonableness"; "the noble and profound application of (which) ideals to life is the most essential part of poetic greatness."

In 1871 he received the decoration of companion of the Order of the Crown of Italy, in recognition of his services in directing the studies of Prince Tomaso, Duke of Genoa, and nephew of King Victor of Italy. The universities of Edinburgh, Cambridge and Oxford conferred upon him their highest honorary degrees. In 1882 he delivered the Rede lecture on *Literature and Science* at Cambridge. In 1883 he lectured in the United States, and again in 1886, on both occasions receiving a welcome born of enthusiasm. The results of these visits are found in his *Civilization in America* (1888). As the Apostle of Culture, and as its exponent, he seems to have regarded America as lacking in the elements productive of "sweetness and light." He does not seem to have believed that "manners maketh man" altogether, for he thought that though in America "manners were good, voices were bad."

Among Mr. Arnold's other works are *Culture and Anarchy, an Essay upon Political and Social Criticism* (1869); *St. Paul and Protestantism* (1870); *Literature and Dogma* (1873); *God and the Bible*, a sequel to the preceding (1876); *Last Essays on Church and Religion* (1877),—in which series he applied the principle of literary criticism to religion and doctrine, at first rather startling his admirers, his object being apparently to find or formulate some confession of faith that would be acceptable to the thoughtfully skeptical members of modern society; *Selected Poems* (1878); *Mixed Essays* (1879); *Irish Essays and Others* (1882); *American Lectures* (1887). He is the author of the biographical notice of SAINTE-BEUVE, Vol. XXI, p. 162, in this ENCYCLOPÆDIA.

In 1883 a government annuity of $1,250 was conferred upon him. While waiting to meet some of his family at Liverpool he died suddenly, April 15, 1888. He died poor, but the following year his friends raised $35,000 as a memorial fund. A portion of this was used to procure a bust of the poet to be placed in Westminster Abbey, the remainder being presented to the widow.

ARNOLD, SAMUEL GREENE, an American historian; born in Providence, Rhode Island, April 12, 1821. He graduated at Brown University in 1841, studied at Harvard Law School, and was admitted to the bar in 1845. In 1852, in 1861, and again in 1862, he was elected lieutenant-governor of Rhode Island. He commanded, for a short time, a battery of artillery on the outbreak of the Civil War. From Dec. 1, 1862, to March 3, 1863, he was a member of the United States Senate in the place of J. F. Simmons, who had resigned. Mr. Arnold published a valuable *History of the State of Rhode Island and Providence Plantations* (1859). He died Feb. 12, 1880.

ARNOLD, THOMAS, an English author; born at Laleham, Staines, Nov. 23, 1823. He graduated in 1845 at University College, Oxford; obtained a position in the colonial office and went to New Zealand; then to Tasmania in 1850, where he became inspector of schools. Having entered the Roman Church, he returned home in 1856, and was appointed to a chair in the University of Dublin. He afterward went to Birmingham, connecting himself there with the Oratory School, and subsequently took up his residence at Oxford. Among his works are: *A Short History of English Literature*, which went through several editions (1866–77); *Chaucer to Wordsworth: A Short History of English Literature to the Present Day* (1868); *Select English Works of John Wycliffe* (1869). Besides these he edited a number of Anglo-Saxon texts and histories.

ARNOLD, THOMAS DICKENS, an American lawyer; born in Spottsylvania County, Virginia, May 3, 1798. He served in the War of 1812 when but 14 years of age, and while on the march to Mobile witnessed the execution, by the order of General Jackson, of a poor youth for the offense of straggling. This made a deep impression upon him, and made him a bitter political opponent of General Jackson in after years. He was admitted to the bar in 1822, and in 1831 was elected to Congress, and became famous for the assault (which he successfully resisted) made upon him by Major Morgan Heard, a friend of Senator Houston, whom he had denounced in a speech in the House. In 1836 he was made brigadier-general of Tennessee militia, and from 1841 to 1843 he again served in Congress. He died in Jonesboro, Tennessee, May 26, 1870.

ARNOLD, THOMAS KERCHEVER, an English writer of popular educational works; born at Stamford, England, in 1800. He was educated at Trinity College, Cambridge, where he graduated in 1821. In 1830 he became rector of the small parish of Lyndon, in Rutlandshire, where he died, March 9, 1853. In 1838 he published *Practical Introduction to Greek Prose Composition*, and the next year his *Latin Prose Composition*. These works are still largely used. He also published, with the Rev. J. E. Riddle, an *English-Latin Lexicon* (1847); edited 25 volumes of classics, and produced English, French, Italian, German and Hebrew grammars. As a theologian he published several volumes of sermons, and some controversial treatises. He abridged the American translation of *Hengstenberg's Christology*.

ARNOLD, WILLIAM DELAFIELD, an English author; born at Laleham, near Staines, April 7, 1828. He was a son of Dr. Thomas Arnold, of Rugby, and brother of Matthew Arnold, and received his early education in his father's school, entering Christ Church, Oxford, in 1846. He joined the Indian army in 1848, but was obliged to leave it in 1855, on account of ill health. He then became director of public education in the Punjab. He published a novel entitled *Oakfield, or Fellowships in the East*, and a translation of the first series of Dr. L. Wiese's

*German Letters on English Education* (1854). He died at Gibraltar, April 9, 1859.

ARNOLFO DI CAMBIO, a Tuscan architect and sculptor; born at Colle, France, 1232. He was a pupil of Nicolo Pisano, and developed the combination of sculpture and architecture that made his time famous in the history of Italian art. Among the greatest monuments to his fame are the Church of Santa Croce (1295) and that of Maria del Fiore (1298), both in Florence, besides which the latter city has many examples of his art in various buildings. He died in Florence 1310.

ARNOT, a post village of Tioga County, north-central New York, on a branch of the New York, Lake Erie and Western railroad. Productive mines of semi-bituminous coal are here found. There are extensive manufactories of lumber. Population 1890, 644.

ARNOT, WILLIAM, a Scottish preacher and author; born at Scone, Nov. 6, 1808; studied at Glasgow, and became minister of a parish there in 1839. He left the Established Church at the disruption in 1843, becoming a minister of a Free Church in Glasgow; in 1863 he went to Edinburgh. He published *Laws from Heaven for Life on Earth; Illustrations of the Book of Proverbs; The Parables of Our Lord;* and *The Church in the House.* He died at Edinburgh, June 3, 1875.

ARNOULD, ARTHUR, a French journalist, author and politician; born at Dieuze, Meurthe, April 7, 1833. Completing his studies in Paris, he became secretary for the *Revue National*, writing also for other publications. He supported the radical party, and was associated with M. Henri de Rochefort on *La Marseilles* and then on the *Journal du Peuple.* In the election of 1871 for the National Assembly he received 65,005 votes, but was not elected. After the insurrection he was elected a member of the Commune, and voted with the moderate party, opposing the Committee of Public Safety. After a period of retirement from France he returned and devoted himself to literature, producing, among other works *Contes Humoristiques* (1857); *Les Trois Poètes* (1859); *Béranger, ses Amis, ses Ennemis et ses Critiques* (1864); *Histoire de l'Inquisition* (1869); *Histoire Populaire et Parlementaire de la Commune de Paris* (1878). The latter, published at Brussels, gave rise to a lively controversy. Besides the above, he wrote a number of works of fiction and some dramatic pieces. He died at Paris, Nov, 25, 1895.

ARNOULD, MADELEINE SOPHIA, a French opera-singer; born at Paris, Feb. 14, 1774; was the daughter of a hotel-keeper. She received a good education, and possessing a fine voice and an attractive face and figure, on her appearance upon the stage at the age of 13 she drew much attention from the leaders of the society of the gay capital. Among her friends were Madame de Pompadour, Diderot and Rousseau. From 1757 until 1778 her career was a continual triumph. She died in 1803. See her biography by Lamotte-Langon (2 vols., 1837). Her *bon mots* were collected and published in 1813. One of her sons was a colonel in the French army and was killed in the battle of Wagram.

ARNPRIOR, a town of Renfrew County, north-eastern Ontario, on the Madwaska River and Canadian Atlantic railroad, 52 miles W. of Ottawa. It has marble-quarries, woolen manufactures, and in the vicinity are iron-mines. Population 1895, 3,341.

ARNSWALDE, a town of Brandenburg, Prussia, situated 41 miles S.E. of Stettin, on the Stettin and Posen railroad, between three lakes. Population, 7,378, largely engaged in iron-work and manufactures.

ARNULPH, emperor of Germany, was born about 850 A.D., being the illegitimate son of Carlomann, king of Bavaria, who was a grandson of Charlemagne. He defeated the Normans at Louvain, 891; captured Rome in 895, and was proclaimed emperor by the pope 896. He died at Ratisbon, Dec. 8, 899.

AROIDS, a common name given to members of the ARUM FAMILY; q.v., in these Supplements.

AROLSEN, capital of Waldeck, a principality of western Germany, on the Aar, 21 miles N.N.W of Cassel. A library of 30,000 volumes is here, belonging to the Prince of Waldeck. It has manufactures of woolen cloth and leather. Population, 2,620.

AROMA, a term sometimes employed to designate the principle of those substances whose extremely minute particles are supposed to affect the organs of smell so as to produce fragrant odors, which are diffused without perceptible loss of weight of the substances producing them, such as vanilla, lavender, cloves, etc. The aroma of plants, by the process of maceration, may be transferred to fixed oils.

AROMATICS, a class of medicines which owe their properties to the essential oils, to benzoic and cinnamic acids, to volatile products of distillation or to odorous glandular secretions. The plants that contribute to this class of medicines are those which yield essences, camphor, or odorous resins. In some cases the aromatic matter is diffused throughout all parts of the plant, but it is usually condensed in particular organs. As a general rule, these substances act as diffusible stimulants of more or less power, and as anti-spasmodics, while those in which a bitter principle is present act as vermifuges and tonics. In the United States aromatics are usually associated with other medicines; but in France aromatic infusions, lotions, etc., are prescribed. See PHYSIOLOGY, Vol. XIX, p. 52.

AROMATIC VINEGAR, a vinegar of an agreeable fragrance, which is generally prepared by adding oil of cloves, lavender, rosemary and *Acorus Calamus* (and sometimes camphor) to crystallizable acetic acid, or by distilling the acetate of copper in an earthen retort and receiver, and treating the liquid which passes over with the fragrant oils mentioned above. It is a powerful volatile perfume, which, when inhaled, excites the nostrils, and is therefore useful in cases of fainting, headache, nervous debility, etc., and is a perfume used in vinaigrettes. It is a powerful corrosive, and must be handled carefully.

AROO OR ARROO. See ARU ISLANDS, Vol. II, p. 670.

AROOSTOOK, a river which rises in Piscataquis County, in northern Maine, and falls into the St. John, in New Brunswick, after a course of about 120

miles. It has an historical interest in connection with the dispute regarding the northeast boundary between the United States and British America.

ARPAD, the popular national hero of Hungary. He was chosen duke on his father's death in 889 A.D., and by a course of incessant and successful warfare with the Bulgarians, Wallachians, etc., extended the first conquests of the Magyars on all sides. He died in 907, leaving his son in possession of the supreme command. The dynasty founded by him became extinct in 1301, with Andreas III.

ARPEGGIO, in music, the employment of the notes of a chord in a rapid and even succession, instead of simultaneously; also, in pianoforte music, playing broken chords. Hence a chord so played or broken, or a chord-passage.

ARQUEBUSE, a hand-gun. See GUN-MAKING, Vol. XI, p. 278.

ARRACACHA, a name of South American origin given to several plants with tuberous roots, notably species of *Arracacia*, a genus of *Umbelliferæ*. *A. esculanta* is extensively cultivated in the Andes, and its tubers are highly prized for food, being said to have a flavor between that of the parsnip and of the chestnut.

ARRAGONITE. See MINERALOGY, Vol. XVI, p. 398.

ARRAH, a town in the district of Shahabad and the presidency of Bengal, 31 miles W. of Patna. During the mutiny of 1857, Arrah, in variety and intensity of interest, was second only to Cawnpore, Delhi and Lucknow, connected as it was with a heroic defense, a heavy disaster and a brilliant victory. Population, 39,386.

ARRAN, SOUTH ISLES OF, three small islands, called Inishmore, Inismain and Inishere, at the entrance of Galway Bay, 4 miles off the west coast of Ireland. On these islands are the remains of forts and other structures of unhewn stone, supposed to have been built by the Belgæ in the first century, besides those of oratories, etc., of the sixth and seventh centuries. Total area, 11,287 acres; population, 3,500.

ARRANGING, a term in music, which means the arranging or adapting a piece of music so as to be performed on an instrument different from that for which it was originally composed, as when orchestral or vocal compositions are set for the piano, or the reverse.

ARRASTRE OR ARRASTRA, a rude mill for grinding and amalgamating gold and silver ores, used in Spain and Mexico, and less extensively in the United States. It consists of a basin hollowed into hard rock, having a vertical axis with horizontal arms, to which large stones are attached by chains and dragged over the ore by the revolution of the shaft. The motor-power is produced by mules.

ARRAWAK INDIANS, a small native tribe of British Guiana. The tribe represents the remnants of a formerly extensive race, widely diffused throughout most of the West Indian Islands, the coasts of Guiana and even parts of Venezuela. They had constantly to protect themselves against the attacks of the Caribs. They have become partially civilized by the efforts of the Moravian missionaries. They are a peaceable and agricultural people, and are noted for their euphonious language.

ARREBO, ANDERS CHRISTENSEN, a Danish poet. See DENMARK, Vol. VII, p. 90.

ARREST is the seizing of a person for the purpose of detaining him in custody. Arrest most frequently occurs in connection with criminal prosecutions, and in such cases consists of apprehending a person for the purpose of compelling him to make answer to some charge of crime which is made against him. Generally, in the United States, any peace-officer, such as a sheriff, police-officer, constable, or justice of the peace may, without a warrant, arrest any person who commits a felony or misdemeanor in the presence of such officer, and any peace-officer may, without a warrant, arrest a person who he reasonably suspects has committed a crime amounting to a felony, whether the crime has been actually committed or not. A private person may arrest one who commits a felony in his presence, or one whom he reasonably suspects to be guilty of a felony, provided a felony has been committed, but in an action for damages for false arrest he will be obliged to prove that a felony was really committed, and that he had reasonable grounds of suspicion against the person arrested. In any case, however, where arrest has been made without the authority of a warrant, it is necessary that a warrant should be procured at the earliest opportunity after the arrest has been made, unless the crime was committed in the presence of the person making the arrest. A warrant is a written judicial order for the apprehension of a person accused or suspected of having committed a crime or misdemeanor, and is usually issued upon presentation to the court of an affidavit stating that the person making the affidavit has reasonable grounds to suspect that the person against whom the warrant is issued is guilty of the offense charged. A person making an arrest under authority of a warrant must be a properly authorized officer, or his assistant, and must make the arrest within the jurisdiction of the court from which the warrant was issued. An arrest may be made during either night or day, and generally, in the case of indictable offenses, on Sunday. An officer may use such force as is reasonably necessary to effect the arrest, and may break open the doors, even, of the criminal's residence, provided he first make demand for admission. If a person charged with felony, whom an officer is attempting to arrest, is killed while resisting the officer, or in attempting to escape, the officer will be justified if his action was necessary to prevent an escape.

Arrest, in civil practice, is the apprehension of a person by lawful authority for the purpose of requiring him to answer a demand against him in a civil action. In this country a person cannot now be arrested for debt.

The right of arrest in civil practice is now generally confined to cases of tort for personal injury, or where the defendant is guilty of fraud or the breach of a fiduciary duty, or where he attempts to dispose of his property for the purpose of defrauding his creditors or to conceal it from seizure.

Arrest is also frequently permitted on mesne process for the purpose of compelling the defendant to appear in court. At the present day the right of arrest on civil process is greatly restricted in this country and is regulated entirely by statute. Members of the state legislatures and Congress are exempt from arrest, except for breach of the peace and crimes amounting to felony, while attending a session, and during a reasonable time before and after the session, while coming from or returning to their homes. In most states, voters, while going to or from or while attending at the polls, are exempted from arrest under civil process, as are also suitors, witnesses, attorneys, judges, jurors and other officers of the court while actually attending in court in their respective capacities, and while going to and coming from court. See ARREST, Vol. II, p. 629.

ARREST OF JUDGMENT is the act of the court by which it refuses to give judgment after a finding or verdict for the plaintiff, for the reason that the record reveals some defect in the proceedings which is fatal to a right to recover in that action. The objection upon which a motion to arrest the judgment is based must appear upon the face of the record itself, as where there is a material variation between the verdict and the complaint or declaration, or where the case laid in the declaration is not sufficient upon which to base a judgment. But irregularity at the trial, or a defect in the evidence produced, will not constitute a ground for arresting the judgment. The matter urged in arrest of judgment must be such as would be fatal to the declaration if it had been suggested on demurrer. The rules concerning arrest of judgment are generally the same in civil and criminal cases. If the judgment is arrested, all proceedings are set aside, and judgment is entered for the defendant, but is not a bar to further proceedings on the same cause of action, and in criminal cases does not, in most states, prevent a new indictment for the same offense. See ARREST, Vol. II, p. 629.

ARRHENATHERUM, a genus of grasses, allied to *Avena*, the "oat-grass," and cultivated for fodder in France. Often called "false oat-grass."

ARRHIDÆUS, PHILIP, a half-brother of Alexander the Great, proclaimed king at Babylon after his brother's death. His wife, Eurydice, having intrigued for the destruction of rival claimants, both were confined in a narrow dungeon, where they committed suicide, 317 B.C.

ARRIAZA, JUAN BAUTISTA DE, a Spanish poet; born at Madrid, 1770, and died there in 1837. He entered the diplomatic service, and while in London published *Emilia* (1803). He was a strong supporter of absolute monarchy, and on his return to Spain in 1807, obtained office at the court of Ferdinand VII, in the bureau of foreign affairs. His other works are *Poesias Patrioticas* and *Poesias Liricas*. Both went through several editions.

ARRIGHI DI CASANOVA, JEAN TOUSSAINT, a Corsican general; born at Corte, March 8, 1778. He entered the French service, in which he distinguished himself, and was wounded at St. Jean d'Acre, 1799. Napoleon conferred upon him the title of Duke of Padua; on the field of battle at Essling, 1809, he was made a general of division. He became governor of Corsica upon the revival of the fortunes of Napoleon. From 1815 to 1820 he was an exile. In 1849 he was elected to the French legislative assembly. He died in Paris, March 22, 1853.

ARROBA, a Spanish and Portuguese unit of weight, which varies in different parts of Spain and Portugal, and also in the South American Spanish countries. At Saragossa it is 27.390 pounds avoirdupois (12.424 kilos); at Lisbon, 32.381 pounds (14.688 kilos); Barcelona, 22.985 pounds (10.429 kilos); Valencia, 28.272 pounds (12.824 kilos); Paraguay, 27.410 pounds (12.433 kilos); Castile, Buenos Ayres, Chile, Mexico, 25.317 pounds (11.484 kilos); Alecante, 28.254 pounds (12.816 kilos). The term *arroba* was also applied to a measure of wine, spirits, etc., the practice of weighing such liquids having originated in Spain with the Moors. The wine weight was 32 pounds to the arroba.

ARRONDISSEMENT. See FRANCE, Vol. IX, p. 509.

ARROW-GRASS, the popular name of *Triglochin*, a genus of the monocotyledonous family *Juneaginaceæ*. The common species is *T. palustris*, common in marshes and on the margin of pools.

ARROWHEAD, the popular name of the genus *Sagittaria*, belonging to the monocotyledonous family *Alismaceæ*, given on account of its strikingly arrow-shaped leaves. The whole family is more or less aquatic, *Sagittaria* being a common plant bordering stagnant waters.

ARROYO MOLINOS, a village in Estremadura, Spain, noted as the scene of General Girard's complete discomfiture by Lord Hill, Oct. 28, 1811.

ARSACES, the name borne by a series of Parthian kings, and by Mithradates I. See PERSIA, Vol. XVIII, pp. 587, 588, 589, 591.

ARSENAL, a manufactory, but more particularly a storehouse of arms and munitions of war. In the United States, previous to the War of the Revolution, there were no armories or arsenals. In 1776, however, powder was manufactured in Virginia, and in the following year brass cannon were cast in Philadelphia. In 1777, General Washington chose Springfield, Massachusetts, as a location for an arsenal, and during the next ten years small arms were manufactured there, this foundry being the origin of the National Armory. About the same year an arsenal was established at Carlisle, Pennsylvania. The armory at Harper's Ferry, was built in 1795, and Congress ordered the erection of other arsenals the same year, and again in 1808 and 1812; the plan of Congress being to have an arsenal in each state. The arsenal at Harper's Ferry, destroyed during the Civil War, has not been rebuilt. In 1838 all arsenals and armories were placed in charge of the ordnance department, under whose direction improvements are constantly incorporated in all arms, as well as in the general system of management. The manufacture of arms is now conducted with such precision that each part is an exact duplicate of the original pattern; thus every analogous part of the same piece is interchangeable.

In 1847 the United States had 2 armories and 17

arsenals; in 1863 there were 23, of which 9 were enlarged during the Civil War. The armory at Springfield has attained a capacity of 1,000 muskets a day. A number of private manufactories existed during the war, but these were also under the supervision of the ordnance department, so that uniformity was achieved in all arms used.

The following is a list of armories, arsenals, and depots in the United States, with their post-offices: Allegheny arsenal, Pittsburg, Pennsylvania; Augusta arsenal, Augusta, Georgia; Benicia arsenal, Benicia, California; Columbia arsenal, Columbia, Tennessee; Fort Monroe arsenal, Fort Monroe, Virginia; Frankford arsenal, Philadelphia, Pennsylvania; Indianapolis arsenal, Indianapolis, Indiana; Kennebec arsenal, Augusta, Maine; New York arsenal, Governor's Island, New York; Rock Island arsenal, Rock Island, Illinois; St. Louis powder depot, Jefferson Barracks, Missouri; Sandy Hook proving-ground, New Jersey, post-office Governor's Island, New York; San Antonio arsenal, San Antonio, Texas; Springfield armory, Springfield, Massachusetts; United States powder depot, Dover, New Jersey; Watertown arsenal, Watertown, Massachusetts; Watervliet arsenal, West Troy, New York.

ARSHIN, a Russian measure of length, equivalent to 28 inches.

ARSINOË, the daughter of Ptolemy I, king of Egypt; born about 316 B.C.; was married in her sixteenth year to the aged Lysimachus, king of Thrace, whose eldest son, Agathocles, had already wedded Lysandra, the half-sister of Arsinoë. Later, Arsinoë married her half-brother, Ptolemy Ceraunus, who put her children by Lysimachus to death. Then she married her own brother, Ptolemy Philadelphus. —ARSINOË, daughter of Ptolemy Auletes and sister of Cleopatra, who, during the siege of Alexandria by Cæsar, was recognized as queen by the Alexandrians; after that place fell into the hands of the Roman soldiers, was carried to Rome by Cæsar, who led her in triumph, 46 B.C. She afterwards returned to Alexandria, but was put to death by Antony, upon the solicitation of Cleopatra, 41 B.C.

ARSINOË, an ancient Egyptian city west of the Nile, named by Ptolemy Philadelphus in honor of his queen. (See ARSINOË, above). It was originally called Crocodilopolis, and the Egyptians had a temple there devoted to the worship of the crocodile. Another city of the same name, near Suez, was connected with the Nile by a canal.

ARSIS AND THESIS, terms in music, the former being applied to the raising and the latter to the falling of the hand in beating time. The terms are also applied to the elevation and depression of the voice, and also to the accentuation of syllables in poetical scansions, the first referring to the unaccentuated syllables and the latter to the accentuated syllables.

ARS-SUR-MOSELLE, a town of Lorraine, Germany, 6 miles S.W. of Metz. It is a manufacturing town. Population, 5,340.

ARTA, a province in eastern Thessaly, Greece, the river Arta on the west separating it from Albania. The province reaches south, where its borders are washed by the Gulf of Arta. The tributaries of the river Arta drain the province. Its area is 395 square miles, and population 32,890. Its capital is Arta, on the left bank of the Arta, 7 miles from its mouth. This port is one of the chief outlets for the products of southern Albania, and has a population of 7,084. The province was transferred from Turkey to Greece in 1881. For a history of the town, the river Arta, and Gulf of Arta, see ARTA, Vol. II, pp. 639, 640.

ARTABANUS, the last of the Arsacidæ. See PERSIA, Vol. XVIII, pp. 605, 606.

ARTABAZUS, the name of several Persian generals. The most noted was Artabazus, a satrap of Asia Minor during the reign of Artaxerxes III, against whom he led a revolt, 356 B.C., and gained several victories; but was subsequently defeated and fled to the court of Philip of Macedon. He returned to Persia and was loyal to Darius, being present with the latter at the battle of Arbela, where the Persians were defeated by Alexander the Great. He was made satrap of Bactria 330 B.C. by Alexander, and died at an advanced age, about 320 B.C.

ARTAPHERNES, a Persian satrap, half-brother of King Darius Hystaspes, who appointed him, in 506 B.C., ruler of the Asiatic coast of the Ægean Sea and other portions of Asia Minor. He attempted the restoration of Hyppias, the tyrant, who had been banished from Athens, but was unsuccessful. He suppressed a revolt of the Ionians, who had risen in revolt against Persia (498 B.C.).—ARTAPHERNES, his son, was appointed, with Datis, to command the Persian army sent to invade Greece, 490 B.C., and which was defeated on the plain of Marathon. He commanded the Lydians in the expedition of Xerxes against Greece, 480 B.C.

ARTAUD, NICOLAS LOUIS, a French author; born in Paris, Dec. 6, 1794. He was a famous Greek scholar, and translated the tragedies of Sophocles (1827); the comedies of Aristophanes (1830), and the tragedies of Euripides (1832). He wrote an *Essay on the Poetical Genius of the Nineteenth Century* (1835). He was inspector of the Academy of Paris and inspector-general of letters, soon after the revolution, 1830. In 1840 he was chosen to organize instruction in Algeria, and before his death was a member of the council of public instruction. He died in Paris, Nov. 9, 1861.

ARTAUD DE MONTOR, ALEXIS FRANÇOIS, CHEVALIER, French author and diplomatist; born at Paris in 1772. He was employed by the members of the royal family as ambassador to the Holy See, and served for a time as regular secretary of the French legation at Rome. He subsequently held similar positions at Vienna and at Florence. He became a member of the Academy of Inscriptions in 1830, and from that time devoted himself to literature. Among his works are: *Histoire de l'Italie; Considérations sur l' État de la Peinture en Italie; Voyage dans les Catacombes de Rome;* and *Histoire des Souverains Pontifs.* His *Life of Pope Pius VII* passed through 11 editions, and gained for him, in 1835, a prize from the French Academy. He died Nov. 12, 1849.

ARTAXATA, ancient capital of Armenia, on the Araxes. Here Hannibal, the Carthaginian, took refuge when he fled from Antioch, and it is believed

he superintended in the building of the city. The Romans destroyed it, A.D., 58 but it was rebuilt by Tiridates, the Armenian king, who renamed it Neronia, after Nero, to whom he was indebted for his throne. It was captured by the Persians, A.D. 370.

ARTEMAS WARD. See BROWNE, CHARLES FARRAR, Vol. IV, p. 389.

ARTEMISIA, a large genus of herbs and shrubs of the family *Compositæ*, with inconspicuous flowers, and usually an aromatic odor and bitter taste. Species of the eastern hemisphere are largely known as "wormwoods," and are of frequent use in medicine. Some of the European species have become naturalized in the Eastern United States. The indigenous North American species are found chiefly west of the Mississippi, being very abundant in dry regions, often absolutely covering extensive areas, and known as "sage-brush." The best known species of sage-brush are *A. tridentata* and *A. cana*. *A. Absinthium* of Europe, as the name suggests, furnishes the peculiar ingredient of the French absinthe.

ARTERIES, DISEASES OF. See SURGERY, Vol. XXII, pp. 683, 684.

ARTESIAN WELLS. The American system of boring these as well as other classes of wells was invented by Col. N. W. Green in 1861, but not patented until 1868. In the United States wells for various purposes have been bored throughout almost all sections. The quest for petroleum, salt-brine, gas, water, and tests for coal and other minerals, has prompted the boring of many wells, which, failing totally or partially of the purpose for which they were sunk, have become flowing wells of excellent water in immense quantities. In the great manufacturing centers of the Eastern states these wells are quite common, as well as in New York, Pennsylvania, Virginia, South Carolina, Alabama, Ohio and Kentucky. In the city of New York, although the geological conditions are very unfavorable, some excellent artesian wells exist, furnishing a copious supply of good water, obtained from an average depth of 500 feet. At St. Louis there are two wells of great depth, the first of which is 2,199 feet and discharges 75 gallons of water per minute. The second consumed three years and six months in sinking it to a depth of 3,843 feet, with a bore of 4½ inches. At Terre Haute, Indiana, there are several wells of from 1,600 to 1,900 feet in depth, the water of which is strongly impregnated with sulphur and widely patronized, both for bathing and drinking purposes. In the grounds of the capitol building at Columbus, Ohio, is an artesian well 2,775½ feet deep, but the water is salt, with a temperature of 71° F. At Chicago many wells have been bored and water of great purity obtained at moderate depth. At Charleston, South Carolina, there is a well 1,250 feet deep, which was commenced in 1848. Much difficulty was experienced in sinking one at New Orleans to a depth of 630 feet, but with the system now in vogue either of these could soon be put down. The most important use to which artesian wells have as yet been put is for the purpose of securing water for irrigation purposes. They first came into use in this connection in California, and with marked success. In many parts of the great Southwest, where no surface water was obtainable, and where no indications were present that subterranean reservoirs existed, wells yielding immense quantities of the purest water have been obtained. Experiments under government supervision proved that throughout these districts, where both spring and surface water (if at all obtainable) was usually undrinkable from the minerals held in solution, excellent water could be obtained from depths of from 800 to 1,000 feet, in practically unlimited quantities. As a result, the sinking of artesian wells now forms an important feature of the vast irrigation works lately undertaken by the Federal or the several state governments. Desert tracts of hundreds of square miles in extent have been converted into excellent crop-bearing or grazing regions. In portions of the great Sahara Desert wells have been sunk with abundant success, from one of which a constant stream of water flows at the rate of more than 1,000 gallons per minute, forming a small river and enabling the hitherto arid sands to be cultivated and making them very productive. Many more of these wells have since been sunk in the same desert tract, and have not only proved beneficial as regards the growing of crops and fruits, but materially altering the nomadic habits of the Arabs, who have settled down to the cultivation of the soil and constructed permanent villages around the wells. The census returns of 1890 show over 8,000 of these wells on the farms of the western half of this country. About 4,000 of these are employed for irrigation purposes solely, 2,000 of which are in the state of California. The daily average flow of these 8,000 wells is given at 78,000 gallons each, or a total daily flow of 624,000,000 gallons. So prodigal has been the use of the water from these wells as to seriously impair the supply in many cases, and in several of the Western states the passage of laws against the waste of water has been an imperative necessity. See ARTESIAN WELLS, Vol. II, pp. 644–646.

ARTHRITIS, inflammation of the joints, of which there are three kinds: traumatic, rheumatic, and gouty. See RHEUMATISM, Vol. XX, p. 518.

ARTHUR, CHESTER ALAN, the twenty-first President of the United States, was born in Fairfield, Franklin County, Vermont, Oct. 5, 1830. His father, Rev. William Arthur, D.D., was a Scotch-Irish Protestant who graduated at Belfast College, and came to the United States at the age of 18. Here he became a Baptist minister; was interested in antiquarian researches; published a work on *Family Names*, and during several years edited *The Antiquarian*.



CHESTER ALAN ARTHUR.

His mother was Melvina Stone, whose grandfather, Uriah Stone, was a New Hampshire pioneer. Chester, the future President, was educated at Schen-

ectady, New York, entered Union College in 1845, and was graduated in 1848. In 1851 he was principal of an academy in North Pownal, Vermont, where, three years later, James A. Garfield taught penmanship. Soon afterward he began the study of law in Lansingburg, New York, and having saved $500 by teaching school, he went to New York City to enter the law office of E. D. Culver. In 1853 he was admitted to the bar and became junior partner of the firm of Culver, Parker and Arthur. This firm attained much notoriety as legal champions of the negro race, and in 1856 succeeded in obtaining for them the right to ride in public conveyances. Until that time Mr. Arthur belonged to the Whig party, but when the Republican party was formed he was active in giving it local organization. In 1860, when Edwin D. Morgan was re-elected governor, he appointed Mr. Arthur engineer-in-chief on his staff, with the rank of brigadier-general. In 1861 he was ordered to open a branch quartermaster's department in New York City, becoming acting quartermaster-general. Soon afterward he had charge of preparing and equipping the soldiers of the state until the termination of the Civil War. In January, 1862, he made a report to the legislature on the defenses of New York harbor and of the inland border. In February, 1862, he was appointed inspector-general, when he visited the New York regiments in the army of the Potomac. In June, 1862, he served as secretary at the meeting of the loyal governors held in New York City. Later he became quartermaster-general, and as such was efficient in raising the quota of his state. In December, 1863, when Horatio Seymour became governor of the state of New York, the Democrats were in the ascendancy, and Mr. Arthur returned to the practice of law. Meanwhile he had acquired the title of general without having done any service in the field. He then became chairman of the Republican state executive committee of New York, and in 1868 favored the nomination of General Grant for the Presidency. On Nov. 20, 1871, he was appointed collector of the port of New York. When his first term had expired he was renominated and confirmed for a second term. In 1878 he was removed from this office, and in 1879 elected chairman of the Republican state committee. In June, 1880, at the Republican national convention held in Chicago, General Garfield was nominated for the Presidency, and it was deemed advisable that the second nominee should be taken from the Empire State. The New York delegation recommended General Arthur, and he was nominated. In November he was elected Vice-President, and in March, 1881, took his seat. On July 2, 1881, President Garfield was shot, and lingered for 80 days on his bed, and when his death was announced, General Arthur took the oath of office privately in New York City; thereafter he proceeded to Washington, where he was inaugurated on September 22d. At the close of his administration the consideration of the American people was expressed by the Republican national convention in its resolutions, declaring that "in the administration of President Arthur we recognize a wise, conservative and patriotic policy, under which the country has been blessed with remarkable prosperity, and we believe his eminent services are entitled to and will receive the hearty approval of every citizen." His name was presented at the Republican Presidential convention held at Chicago, June 3, 1884, but he failed of nomination. On Oct. 29, 1859, General Arthur married Miss Ellen Louise Herndon, of Fredericksburg, Virginia (daughter of Commandant William Louis Herndon of the navy), who died January 12, 1880. By this marriage there were three children, one of whom died in infancy, the others being Chester Alan, born July 25, 1865, and Ellen Herndon, born Nov. 2, 1871. After his retirement Mr. Arthur resided in New York City, and died there of apoplexy Nov. 18, 1886.

ARTHUR, Sir George, Bart., a British statesman; born in Plymouth, England, June 21, 1784. He entered the army in 1804; was in active service until 1837, when he was knighted and appointed lieutenant-governor of Upper Canada, with the rank of major-general on the staff. In 1841 he returned to England, was created a baronet in recognition of his services in Canada, and from 1842 to 1846 was governor of the Indian presidency of Bombay. Ill health compelled him to leave India, and upon his arrival in England he was made privy councillor, and in 1853 received the colonelcy of the Fiftieth (Queen's Own) Regiment. He died Sept. 19, 1854.

ARTHUR, Timothy Shay, an American author; born near Newburgh, New York, in 1809. About 1835 he became editor of the Baltimore *Athenæum*, and in 1852, removing to Philadelphia, he founded *Arthur's Home Magazine*, of which he was editor until his death. He published over 100 volumes, of which more than one half were reprinted in England and they obtained a notable success everywhere. Among his numerous works are *Lights and Shadows of Real Life; Tales for Rich and Poor; Library for the Household; Ten Nights in a Bar-Room;* and *Steps to Heaven*. He died in Philadelphia, March 6, 1885.

ARTHUR, William, an Irish missionary; born at Kells, County Antrim, 1819. He was educated at Hoxton, England, and became a missionary in Mysore, India, from 1839 until 1842. Returning home, he filled the office of secretary of the Wesleyan Church Missionary Society and was president of the British Conference, and from 1867 until 1871 principal of the Wesleyan College at Dublin. His works include *Personal Reminiscences of a Mission to Mysore* (1847); *The Successful Merchant* (1852); *The Tongue of Fire*, perhaps his most popular work (1856); *Italy in Transition* (1860); *The Modern Jove* (1873); *The Pope, the Kings, and the People* (1877); *Religion Without God* (1884).

ARTHUR'S SEAT, a hill in the immediate vicinity of Edinburgh, 822 feet above the level of the sea. It is supposed to derive its name from the British King Arthur, and, if so, is an instance of the widespread influence of that legend. The hill is very interesting geologically. It is a favorite resort of the citizens of the "Modern Athens," has winding drives, some monuments of antiquity, and furnishes a magnificent view of the city and surrounding country.

ARTICLE, in grammar, a part of speech comprising the words *a* or *an* and *the*, placed before a noun to endow it with a more or less limited meaning. The *a* and *an* are termed the indefinite articles, and *the* the definite article, because the former two refer to any one of a number, and the latter to a particular one. The word *article* itself is derived from the Latin word *articulus*, meaning a joint, which indicates its grammatical function. There was only the definite article in Greek, and the Latin has no article.

ARTICLES, as a legal term, mean the written statement which contains the matter agreed upon or which is established by some person or institution of authority.— ARTICLES IN CHANCERY is a term applied to the formal statement of objections made by a party to the suit to the credibility of witnesses whose evidence has been taken and submitted to the court.— ARTICLES OF AGREEMENT is a term referring to the memorandum in writing which sets forth the terms of a contract. See ARTICLES, Vol. II, p. 653.

ARTICLES OF CONFEDERATION. Eight days after the signing of the Declaration of Independence, a committee especially appointed for that purpose reported to the Continental Congress certain "Articles of Confederation." These were debated, whenever nothing more pressing interfered, until the 15th of November, 1777, when the Articles were adopted and transmitted for ratification to the several legislatures of the thirteen "Free and Independent States." Before July, 1778, all the states had signed, except Maryland, Delaware and New Jersey. These three held aloof because no provision was made for the equitable division of the unoccupied northwest territory. But this matter being finally settled by assurances that all individual state claims would be relinquished, the delegates from these states signed, the last being those from Maryland, on March 1, 1781. The very next day the "Congress of the Confederation" began its sessions at Independence Hall, Philadelphia. In 1783 the Congress removed to Annapolis, Maryland, the following year to Trenton, New Jersey, and in 1785 to New York City. Long before this, however, the vital error in the Articles had become apparent. This was, that while Congress was empowered to make requisitions on the several legislatures for whatever the government might need, no way was provided for enforcing these calls, and experience soon proved that requisitions were usually ignored, or if not ignored, then criticised. Neither could Congress raise money by taxation, by excise, or by tariffs. This soon brought the government into disrepute, both at home and abroad, and in 1787 the Congress called a convention of all the states to meet in May, at Philadelphia, for the sole purpose of revising the Articles of Confederation. Instead of revising, this convention presented the "Constitution of the United States," which was adopted in 1788, and went into operation in 1789. The "Congress of the Confederation," after an existence of eight years, held its final roll-call, Oct. 10, 1788, and expired March 2, 1789. Following is the complete text of the Articles of Confederation:

To All to Whom these Presents shall come, We, the Undersigned, Delegates of the States affixed to our Names, send Greeting.

Whereas, the delegates of the United States of America in Congress assembled did, on the fifteenth day of November, in the year of our Lord one thousand seven hundred and seventy-seven, and in the second year of the Independence of America, agree to certain Articles of Confederation and Perpetual Union between the states of New Hampshire, Massachusetts Bay, Rhode Island and Providence Plantations, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia, in the words following, viz.:

Articles of Confederation and Perpetual Union between the states of New Hampshire, Massachusetts Bay, Rhode Island and Providence Plantations, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia.

Art. I. The style of this Confederacy shall be, "The United States of America."

Art. II. Each state retains its sovereignty, freedom and independence, and every power, jurisdiction and right which is not by this Confederation expressly delegated to the United States in Congress assembled.

Art. III. The said states hereby severally enter into a firm league of friendship with each other, for their common defense, the security of their liberties and their mutual and general welfare; binding themselves to assist each other against all force offered to or attacks made upon them, or any of them, on account of religion, sovereignty, trade, or any other pretense whatever.

Art. IV. The better to secure and perpetuate mutual friendship and intercourse among the people of the different states in this Union, the free inhabitants of each of these states, paupers, vagabonds and fugitives from justice excepted, shall be entitled to all privileges and immunities of free citizens in the several states; and the people of each state shall have free ingress and regress to and from any other state, and shall enjoy therein all the privileges of trade and commerce, subject to the same duties, impositions, and restrictions as the inhabitants thereof respectively; provided, that such restriction shall not extend so far as to prevent the removal of property imported into any state to any other state of which the owner is an inhabitant; provided, also, that no imposition, duties, or restriction shall be laid by any state on the property of the United States, or either of them.

If any person guilty of or charged with treason, felony or other high misdemeanor, in any state, shall flee from justice, and be found in any of the United States, he shall, upon demand of the governor or executive power of the state from which he fled, be delivered up and removed to the state having jurisdiction of his offense.

Full faith and credit shall be given in each of these states to the records, acts and judicial proceedings of the courts and magistrates of every other state.

Art. V. For the more convenient management of the general interests of the United States, delegates shall be annually appointed in such manner as the legislature of each state shall direct, to meet in Congress on the first Monday in November, in every year, with a power reserved to each state to recall its delegates, or any of them, at any time within the year, and send others in their stead for the remainder of the year.

No state shall be represented in Congress by less than two nor by more than seven members; and no person shall be capable of being a delegate for more than three years in any term of six years; nor shall any person, being a delegate, be capable of holding any office under the United States for which he, or another for his benefit, receives any salary, fees, or emolument of any kind.

Each state shall maintain its own delegates in a meeting of the states, and while they act as members of the committee of the states.

In determining questions in the United States in Congress assembled, each state shall have one vote.

Freedom of speech and debate in Congress shall not be impeached or questioned in any court or place out of

Congress; and the members of Congress shall be protected in their persons from arrests and imprisonment during the time of their going to and from and attending on Congress, except for treason, felony or breach of the peace.

Art. VI. No state, without the consent of the United States in Congress assembled, shall send any embassy to, or receive any embassy from, or enter into any conference, agreement, alliance or treaty with, any king, prince or state; nor shall any person holding any office of profit or trust under the United States, or any of them, accept of any present, emolument, office or title of any kind whatever from any king, prince or foreign state; nor shall the United States in Congress assembled, or any of them, grant any title of nobility.

No two or more states shall enter into any treaty, confederation or alliance whatever between them, without the consent of the United States in Congress assembled, specifying accurately the purposes for which the same is to be entered into, and how long it shall continue.

No state shall lay any imposts or duties which may interfere with any stipulations in treaties entered into by the United States in Congress assembled with any king, prince or state, in pursuance of any treaties already proposed by Congress to the courts of France and Spain.

No vessels of war shall be kept up, in time of peace, by any state, except such number only as shall be deemed necessary, by the United States in Congress assembled, for the defense of such state or its trade; nor shall any body of forces be kept up by any state, in time of peace, except such number only as, in the judgment of the United States in Congress assembled, shall be deemed requisite to garrison the forts necessary for the defense of such state; but every state shall always keep up a well-regulated and disciplined militia, sufficiently armed and accoutered; and shall provide and constantly have ready for use, in public stores, a due number of field-pieces and tents, and a proper quantity of arms, ammunition and camp equipage.

No state shall engage in any war without the consent of the United States in Congress assembled, unless such state be actually invaded by enemies, or shall have received certain advice of a resolution being formed by some nation of Indians to invade such state, and the danger is so imminent as not to admit of a delay till the United States in Congress assembled can be consulted; nor shall any state grant commissions to any ship or vessels of war, nor letters of marque or reprisal, except it be after a declaration of war by the United States in Congress assembled; and then only against the kingdom or state, and the subjects thereof, against which war has been so declared, and under such regulations as shall be established by the United States in Congress assembled, unless such state be infested by pirates, in which case vessels of war may be fitted out for that occasion, and kept so long as the danger shall continue, or until the United States in Congress assembled shall determine otherwise.

Art. VII. When land forces are raised by any state for the common defense, all officers of or under the rank of colonel shall be appointed by the legislature of each state, respectively, by whom such forces shall be raised, or in such manner as such state shall direct; and all vacancies shall be filled up by the state which first made the appointment.

Art. VIII. All charges of war, and all other expenses that shall be incurred for the common defense or general welfare, and allowed by the United States in Congress assembled, shall be defrayed out of a common treasury, which shall be supplied by the several states in proportion to the value of all land within each state granted to or surveyed for any person as such land, and the buildings and improvements thereon, shall be estimated, according to such mode as the United States in Congress assembled shall, from time to time, direct and appoint. The taxes for paying that proportion shall be laid and levied by the authority and direction of the legislatures of the several states, within the time agreed upon by the United States in Congress assembled.

Art. IX. The United States in Congress assembled shall have the sole and exclusive right and power of determining on peace and war, except in the cases mentioned in the sixth article: Of sending and receiving ambassadors: Entering into treaties and alliances, provided that no treaty of commerce shall be made whereby the legislative power of the respective states shall be restrained from imposing such imposts and duties on foreigners as their own people are subjected to, or from prohibiting the exportation or importation of any species of goods or commodities whatever: Of establishing rules for deciding, in all cases, what captures on land or water shall be legal; and in what manner prizes taken by land or naval forces in the service of the United States shall be divided or appropriated: Of granting letters of mark and reprisal in times of peace: Appointing courts for the trial of piracies and felonies committed on the high seas; and establishing courts for receiving and determining, finally, appeals in all cases of captures; provided that no member of Congress shall be appointed a judge of any of the said courts.

The United States in Congress assembled shall also be the last resort, on appeal, in all disputes and differences now subsisting, or that hereafter may arise, between two or more states concerning boundary, jurisdiction or any other cause whatever; which authority shall always be exercised in the manner following: Whenever the legislative or executive authority or lawful agent of any state in controversy with another shall present a petition to Congress stating the matter in question, and praying for a hearing, notice thereof shall be given, by order of Congress, to the legislative or executive authority of the other state in controversy, and a day assigned for the appearance of the parties by their lawful agents, who shall then be directed to appoint, by joint consent, commissioners or judges to constitute a court for hearing and determining the matter in question; but if they cannot agree, Congress shall name three persons out of each of the United States; and from the list of such persons each party shall alternately strike out one, the petitioners beginning, until the number shall be reduced to thirteen; and from that number not less than seven nor more than nine names, as Congress shall direct, shall, in the presence of Congress, be drawn out by lot; and the persons whose names shall be so drawn, or any five of them, shall be commissioners or judges to hear and finally determine the controversy, so always as a major part of the judges who shall hear the cause shall agree in the determination. And if either party shall neglect to attend at the day appointed, without showing reasons which Congress shall judge sufficient, or being present shall refuse to strike, the Congress shall proceed to nominate three persons out of each state, and the secretary of Congress shall strike in behalf of such party absent or refusing; and the judgment and sentence of the court, to be appointed in the manner before prescribed, shall be final and conclusive. And if any of the parties shall refuse to submit to the authority of such court, or to appear, or defend their claim or cause, the court shall nevertheless proceed to pronounce sentence or judgment, which shall in like manner be final and decisive; the judgment or sentence and other proceedings being, in either case, transmitted to Congress and lodged among the acts of Congress for the security of the parties concerned; provided that every commissioner, before he sits in judgment, shall take an oath, to be administered by one of the judges of the supreme or superior court of the state where the cause shall be tried, "well and truly to hear and determine the matter in question, according to the best of his judgment, without favor, affection or hope of reward"; provided, also, that no state shall be deprived of territory for the benefit of the United States.

All controversies concerning the private right of soil claimed under different grants of two or more states, whose jurisdictions, as they may respect such lands and the states which passed such grants, are adjusted, the said grants, or either of them, being at the same time claimed to have originated antecedent to such settlement of jurisdiction, shall, on the petition of either party to the Congress of the United States, be finally determined, as near as may be, in the same manner as is before prescribed for deciding disputes respecting territorial jurisdiction between different states.

The United States in Congress assembled shall also have the sole and exclusive right and power of regulating the alloy and value of coin struck by their own authority, or by that of the respective states: Fixing the standard of weights and measures throughout the United States: Regulating the trade and managing all affairs with the Indians, not members of any of the states; provided that the legislative right of any state within its own limits be not infringed or violated: Establishing and regulating post-offices, from one state to another, throughout all the United States, and exacting such postage on the papers passing through the same as may be requisite to defray the expenses of the said office: Appointing all officers of the land forces in the service of the United States, excepting regimental officers: Appointing all the officers of the naval forces, and commissioning all officers whatever in the service of the United States: Making rules for the government and regulation of the land and naval forces, and directing their operations.

The United States in Congress assembled shall have authority to appoint a committee, to sit in the recess of Congress, to be denominated "a committee of the states," and to consist of one delegate from each state, and to appoint such other committees and civil officers as may be necessary for managing the general affairs of the United States under their direction: To appoint one of their number to preside; provided that no person be allowed to serve in the office of president more than one year in any term of three years: To ascertain the necessary sums of money to be raised for the service of the United States, and to appropriate and apply the same for defraying the public expenses: To borrow money or emit bills on the credit of the United States, transmitting every half-year to the respective states an account of the sums of money so borrowed or emitted: To build and equip a navy: To agree upon the number of land forces, and to make requisitions from each state for its quota, in proportion to the number of white inhabitants in such state, which requisition shall be binding; and thereupon the legislature of each state shall appoint the regimental officers, raise the men, and clothe, arm and equip them in a soldier-like manner, at the expense of the United States; and the officers and men so clothed, armed and equipped shall march to the place appointed, and within the time agreed on by the United States in Congress assembled: but if the United States in Congress assembled shall, on consideration of circumstances, judge proper that any state should not raise men, or should raise a smaller number than its quota, and that any other state should raise a greater number of men than its quota thereof, such extra number shall be raised, officered, clothed, armed and equipped in the same manner as the quota of such state; unless the legislature of such state shall judge that such extra number cannot be safely spared out of the same; in which case they shall raise, officer, clothe, arm and equip as many of such extra number as they judge can be safely spared: and the officers and men so clothed, armed and equipped shall march to the place appointed, and within the time agreed on by the United States in Congress assembled.

The United States in Congress assembled shall never engage in a war; nor grant letters of marque and reprisal in time of peace; nor enter into any treaties or alliances; nor coin money; nor regulate the value thereof; nor ascertain the sums and expenses necessary for the defense and welfare of the United States, or any of them; nor emit bills; nor borrow money on the credit of the United States; nor appropriate money; nor agree upon the number of vessels of war to be built or purchased, or the number of land or sea forces to be raised; nor appoint a commander-in-chief of the army or navy,—unless nine states assent to the same; nor shall a question on any other point, except for adjourning from day to day, be determined, unless by the votes of a majority of the United States in Congress assembled.

The Congress of the United States shall have power to adjourn to any time within the year, and to any place within the United States, so that no period of adjournment be for a longer duration than the space of six months; and shall publish the journal of their proceedings monthly, except such parts thereof relating to treaties, alliances or military operations as in their judgment require secrecy; and the yeas and nays of the delegates of each state on any question shall be entered on the journal, when it is desired by any delegate; and the delegates of a state, or any of them, at his or their request shall be furnished with a transcript of the said journal, except such parts as are above excepted, to lay before the legislatures of the several states.

Art. X. The committee of the states, or any nine of them, shall be authorized to execute, in the recess of Congress, such of the powers of Congress as the United States in Congress assembled, by the consent of nine states, shall, from time to time, think expedient to vest them with; provided that no power be delegated to the said committee for the exercise of which, by the Articles of Confederation, the voice of nine states in the Congress of the United States assembled is requisite.

Art. XI. Canada, acceding to this confederation, and joining in the measures of the United States, shall be admitted into and entitled to all the advantages of this Union; but no other colony shall be admitted into the same, unless such admission be agreed to by nine states.

Art. XII. All bills of credit emitted, moneys borrowed and debts contracted by or under the authority of Congress, before the assembling of the United States, in pursuance of the present confederation, shall be deemed and considered as a charge against the United States, for payment and satisfaction whereof the said United States, and the public faith, are hereby solemnly pledged.

Art. XIII. Every state shall abide by the determinations of the United States in Congress assembled, on all questions which by this confederation are submitted to them. And the articles of this confederation shall be inviolably observed by every state; and the Union shall be perpetual. Nor shall any alteration at any time hereafter be made in any of them, unless such alteration be agreed to in a Congress of the United States, and be afterwards confirmed by the legislatures of every state.

And whereas it has pleased the great Governor of the world to incline the hearts of the legislatures we respectfully represent in Congress to approve of and to authorize us to ratify the said Articles of Confederation and Perpetual Union: know ye, that we, the undersigned delegates, by virtue of the power and authority to us given for that purpose, do, by these presents, in the name and in behalf of our respective constituents, fully and entirely ratify and confirm each and every of the said Articles of Confederation and Perpetual Union, and all and singular the matters and things therein contained; and we do further solemnly plight and engage the faith of our respective constituents, that they shall abide by the determinations of the United States in Congress assembled on all questions which, by the said confederation, are submitted to them; and that the articles thereof shall be inviolably observed by the states we respectively represent; and that the Union be perpetual.

In witness whereof, we have hereunto set our hands, in Congress. Done at Philadelphia, in the state of Pennsylvania, the ninth day of July, in the year of our Lord one thousand seven hundred and seventy-eight, and in the third year of the Independence of America.

New Hampshire.—Josiah Bartlett, John Wentworth, Jr.

Massachusetts Bay.—John Hancock, Samuel Adams, Elbridge Gerry, Francis Dana, James Lovell, Samuel Holten.

Rhode Island.—William Ellery, Henry Marchant, John Collins.

Connecticut.—Roger Sherman, Samuel Huntington, Oliver Wolcott, Titus Hosmer, Andrew Adams.

New York.—James Duane, Francis Lewis, William Duer, Gouverneur Morris.

New Jersey.—John Witherspoon, Nath. Scudder.

Pennsylvania.—Robert Morris, Daniel Roberdeau, Jonathan Bayard Smith, William Clingan, Joseph Reed.

Delaware.—Thomas McKean, John Dickinson, Nicholas Van Dyke.

Maryland.—John Hanson, Daniel Carroll.

Virginia.—Richard Henry Lee, John Banister, Thomas Adams, John Harvie, Francis Lightfoot Lee.

North Carolina.—John Penn, Constable Harnett, John Williams.

South Carolina. — Henry Laurens, William Henry Drayton, John Matthews, Richard Hutson, Thomas Heyward, Jr.

Georgia.—John Walton, Edward Telfair, Edward Langworthy.

ARTICLES OF FAITH OR RELIGION. See THE THIRTY-NINE ARTICLES, Vol. II, pp. 653, 654.

ARTICLES OF WAR, a term applied to an act of Congress approved April 10, 1806, to establish rules for the government of the United States army. In 1864, by act of Congress, other rules were incorporated with these for the government of the navy.

ARTICLES, THE SIX, See Vol. II, p. 654.

ARTIFICIAL HORIZON, an astronomical term for a reflecting surface, either of liquid mercury or that of a mirror placed to the true level artificially; used in finding the altitude of a celestial body when the sensible horizon is ill-defined.

ARTIFICIAL LIMBS are employed for the restoration of function after the loss or atrophy of a limb, or a part thereof. The construction of artificial limbs of any considerable degree of utility dates with the beginning of the present century, although crude affairs, unwieldy and cumbersome, are mentioned by Herodotus and other early historians. In the London Royal College of Surgeons is a Roman artificial leg, discovered in a tomb at Capua, dating from 300 B.C. It was composed of wood, iron and bronze, and while ingenious in construction, must have afforded little service to the wearer. The celebrated iron hand of the German knight, Götz von Berlichingen, was invented about 1504, weighed three pounds, and was so constructed as to grasp a sword or lance. A work by Ambrose Paré, translated by Thomas Johnson in 1605, describes "by what means arms, legs and hands may be made by art, and placed in the stead of natural arms, legs and hands that are cut off or lost." From this time until about 1800 there was no improvement worthy of record in the method of making these contrivances, at which time Baillif, of Berlin, constructed a hand which did not exceed a pound in weight, and in which the fingers automatically exercised the movements of flexion and extension, and could be closed upon and retain light objects, such as a hat, and even a pen. Recent years have seen great advances in the adaptation of these mechanical appliances to varied requirements, the business of making them having been much accelerated by the loss of limbs incident to the Civil War in the United States. They are now made of such lightness, and so closely follow the lines and arrangements of the natural limb, as to afford great compensation for its loss, or any part of it, and are so perfect in action as to draw no attention to the wearer. American mechanicians have constructed arms in which motion is given to the fingers, a lateral action of the thumb obtained, and the wrist-movements well imitated. In addition to almost perfect elbow-action, the hand is so constructed that a pin may be picked from the ground, a glass raised to the lips, food carried to the mouth, a sword drawn from the scabbard and held with considerable firmness, and the member is equal to the ordinary requirements of histrionic declamation. Artificial legs have fewer duties to perform than artificial arms, and are comparatively simple. The most perfect legs now made were invented by Dr. Bly. Their advantages are thus summed up by a writer on the subject: (1) Adaptation to all amputations, either above or below the knee; (2) rotation and lateral action of the ankle-joint; (3) power on the part of the wearer to walk with ease, however irregular the surface, as, owing to the motion of the ankle-joint, the sole of the foot readily accommodates itself to the unevenness of the ground, an advantage never before possessed by an artificial limb; (4) the ankle-joint is rendered perfectly indestructible by ordinary wear, as its center is composed of a glass ball resting in a cup of vulcanite; (5) the action of the ankle-joint is created by five tendons, arranged in accordance with the positions assigned to them in a natural leg; these tendons may be rendered tight or loose in a moment, so that the wearer can adjust the tension to his comfort in walking, and also give the foot any position pleasing to the eye; (6) there is a self-acting spring in the knee-joint, urging the leg forward in walking, and imparting automatic motion; (7) the whole is covered with a flesh-colored enamel, that can easily be cleansed; (8) at the knee-joint there is a mechanical arrangement representing the crucial ligaments, and affording natural action to that articulation, by which all shock to the stump is avoided. So perfect is the construction of this leg that it gets out of repair chiefly by breakage of a part. Other parts beside the limbs can also be replaced by mechanical art, such as the nose, lips, ears, palate, cheek and eye. So perfectly have these parts been reproduced that their presence is scarcely discernible, and occasions no inconvenience to the wearer.

ARTIGAS, José, a South American general, born at Montevideo, about 1755. After having been a leader of lawless gauchos he entered the service of the republic, or *junta gubernativa*, of Buenos Ayres in 1811; during the insurrection against Spain, gained numerous victories and was promoted to the position of general. Joining the republican army which besieged Montevideo, he acted so independently that the new director, Posadas, outlawed him. He raised a force of gauchos, defeated the troops sent to capture him, and compelled the junta to recognize him as the independent chief of Uruguay in 1814. He drove the Spanish out of Montevideo, made himself dictator, and in 1820 attempted the capture of Buenos Ayres, in which he failed. He fled to Paraguay, and died at Candelaria in 1851.

*ARTILLERY IN THE UNITED STATES. For an account of ARTILLERY and its rise and growth in other countries, see Vol. II, pp. 655 et seq.

HISTORY. The history of the American artillery dates from the dawn of the American Revolution, when it was early recognized as a portion of the military establishment. There were scattered through the colonies a limited number of men who had either served in the Royal Artillery or been associated with it during the colonial wars, and a few batteries had been formed and trained in the largest cities. So, when the pressing need for this special arm was evident, these men of limited experience

*Copyright, 1896, by The Werner Company.

formed the nuclei of the new artillery organizations raised for the contest with the mother country.

It would be gross injustice to judge it by present standards but for those days it certainly was a well-officered and efficient force, and the verdict of one well qualified to judge (Lafayette) was, that "the progress of the artillery during the Revolution was regarded by all conversant with the facts as one of the wonders of that interesting period."

From the end of the Revolution to the Civil War this arm led a checkered existence, its numbers often being reduced to insignificance from mistaken motives of economy, and its efficiency greatly impaired by failure of those in authority to understand and make provision for its pressing needs.

It has at times, both in peace and war, been armed and equipped as infantry, and at others, while so armed, has, in addition, performed the duties of managing and fighting the pieces of ordnance supplied to Western forts and Indian expeditions. It was for a time also charged with keeping in repair the varied arms and equipments of the other troops.

At the commencement of the Civil War its batteries were found widely scattered and in remote places, but as soon as available the regular organizations formed in the various armies the bases of the great artillery establishments of that period.

It has, in a word, played a most prominent part during the various crises of the national existence, and its brilliant record is inseparably interwoven in the history of struggles with foreign foes and domestic difficulties.

GENERAL ORGANIZATION AND ADMINISTRATION. The general organization of the artillery is into 5 regiments of 12 batteries each,—a total of 280 officers and 4,025 enlisted men. The regiment is composed of 10 batteries of heavy or sea-coast artillery and 2 batteries of light or field artillery, and is officered with 1 colonel, 1 lieutenant-colonel, 3 majors, 12 captains, 26 first lieutenants and 13 second lieutenants. The personnel of the battery on the peace basis is as follows:

| | Sea-coast. | Field. |
|---|---|---|
| Officers | 4 | 5 |
| Non-commissioned officers | 9 | 11 |
| Musicians | 2 | 2 |
| Artificers | 2 | 2 |
| Wagoner | 1 | 1 |
| Privates (drivers and cannoneers) | 51 | 59 |
| Total enlisted strength | 65 | 75 |

INSTRUCTION. For advanced instruction in the duties pertaining to the sea-coast branch, the artillery school at Fort Monroe, Virginia, constitutes an independent command, which is governed by special regulations and is under the immediate supervision of the headquarters of the army. Eight batteries constitute its permanent peace garrison, and lieutenants are detailed to these for tours of duty extending through periods of two years. The instruction includes both the theory and practice of gunnery, and covers all the varied duties of the sea-coast artillery, the facilities for this being here far superior to those of any other station. Instruction is also included in the drill and maneuver with the *matériel* of the siege-artillery, no permanent siege train being maintained and no special personnel being organized for this service.

Captains of light batteries are assigned by selection, and lieutenants are detailed for tours of duty, not exceeding three years, with the light batteries of their respective regiments. A school for the purpose of instruction in the combined operations of cavalry and light artillery is located at Fort Riley, Kansas. Three mounted batteries are there stationed.

On a peace basis, the number of guns for a field battery is fixed at four, or two platoons. This for service in war would doubtless be increased to six. The light batteries all have the 3.2-inch light breech-loading field-gun. One battery is also armed for special service with Hotchkiss revolving cannon, of 1.5-inch caliber. For side-arms, the non-commissioned officers have sabers and revolvers, and the drivers revolvers. For guard-duty, riot-duty and the like, the heavy artillery has the arms and equipments of the infantry.

The details of the methods of conducting the technical instruction of artillery, target-practice, both heavy and light, and the competitions, are prescribed in orders and instructions issued from the army headquarters.

For each department, within which are the headquarters of one or more regiments of artillery, a special artillery-inspector is detailed from the field-officers of that arm.

The present rapid development in our modern system of sea-coast defenses has made necessary an increase in the personnel of the artillery arm, and pending legislation (1896) has in view such increase, with provision for expansion in case of war.

One proposition is to permanently separate the field from the sea-coast artillery, that the officers may devote their efforts and attention exclusively to the one branch to which they would in that event be permanently assigned. The militia in the several states have artillery organizations aggregating 5,000 men. This is classed almost exclusively as "light," but in some sea-coast states instruction is also given the militia in drill and practice with heavy guns. To provide a suitable battery, and for the transportation of necessary cannon, Congress has granted an allowance of $5,000 for each state bordering on sea or gulf coast, and having a permanent camping-ground, for the encampment of the militia not less than six days annually.

TECHNICAL ARTILLERY. In the United States the duties of the technical artillery are assigned to a special staff corps known as the ordnance department. The chief of ordnance is, under the direction of the Secretary of War, charged with the duty of providing, preserving, distributing and accounting for every description of artillery, small arms, and all other ordnance stores which may be required by the fortresses of the country, the armies in the field and for the body of the militia of the Union.

The officers number 57, and the enlisted force is limited to 485 for duty at arsenals and depots, with 110 special ordnance-sergeants charged with the immediate care of the general ordnance *matériel* at forts and posts, and with the responsibility for all ordnance stores at stations not garrisoned.

Vacancies in the grade of first lieutenant of ord-

nance are filled by examination and transfer from the line of the army. Candidates, to be eligible, must be less than 30 years of age, and have to their credit at least two years' service in the line.

MATÉRIEL.—*Metal—Field-Guns.* For its first guns this country depended more or less upon purchases made abroad, but the American foundries made an early start in this manufacture.

For the field-guns, bronze was the metal first preferred, but in 1801, from economic considerations, this was supplanted by cast iron, which latter remained in almost exclusive use for the manufactures of over thirty years. The cast-iron system did not prove a success, however, and confidence in it having been lost, the use of bronze was resumed in 1836, on the recommendation of the ordnance board. In 1841, bronze was officially and permanently recognized as the standard metal for field-ordnance, and it so remained until 1861. On the introduction of the rifled system, the bronze of that period proved too weak to withstand the increased strain, and too soft to resist the wear on the rifling.

To meet the changed conditions and supply the demands of the Civil War there was introduced the three-inch field-gun of wrought iron, so constructed that its fibers were favorably disposed to resist the tangential or principal strain tending to produce rupture. This was used extensively and with great success, remaining the standard light field-gun until the introduction of the breech-loading system, when forged steel was eventually adopted.

During the Civil War many Parrott rifled field-guns (10 and 20 pounders) were also successfully used, these being of cast iron, reinforced by a band of wrought iron shrunk about the seat of the charge. A due proportion of the light 12-pounder bronze (Napoleon) smooth-bored guns were retained, and in the broken and wooded country, where most of the operations were conducted, the heavy shell and case shot of these guns were often found more destructive at the shorter ranges than the rifle-ammunition of that date.

*Metal—Heavy Ordnance.* Cast iron was early adopted in America as most suitable for the large castings required for heavy ordnance, and although experiments were made in other directions, this metal, up to the introduction of the rifled systems, remained the standard, and the system of heavy guns had then doubtless attained a higher state of excellence than that reached in any other country. This was due to the special study devoted to the properties and manipulation of cast iron by the founders and ordnance-officers, and especially to the introduction, in 1860, of the Rodman process of hollow casting and interior-cooling. The masterpiece of this system was cast in 1863,—a 20-inch smooth-bore weighing 115,900 pounds, and throwing a solid shot of 1,080 pounds.

Heavy rifled guns of the Parrott system were manufactured and used during the Civil War, but confidence in the system as applied to heavy ordnance was lost, due to frequent accidents, and it early fell into disrepute, and into disuse as soon as the most pressing needs were over.

After the Civil War, efforts were made from time to time to adapt the favorite metal, cast iron, for use, either alone or in combination, in rifled guns, but with very little success. Wrought iron was also experimented with for heavy guns, but these proved expensive failures. Heavy rifles of cast steel were tested with similar result, and the final development of long experiment and controversy is the breech-loading forged-steel system of to-day.

The following table gives the modern system of breech-loading rifled ordnance for the land service of the United States.

| CALIBERS. | Weight. | Total Length. | Length of Bore. | CHARGE. | | Powder-pressure. lbs. | Muzzle-velocity. | Muzzle-energy. | Penetration in steel at 1,000 yards. Inches. |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Powder. | Projectile. | | | | |
| *Mountain and Field Artillery.* | lbs. | Feet. | Calibers. | lbs. | lbs. | Per sq. in. | Feet per second. | Foot-tons. | |
| 1.65-inch mountain-gun, steel (Hotchkiss) | 121 | 3.833 | 20.848 | .344 (5.5 oz.) | 1.9 | ---------- | 1,298 | 22.8 | ------ |
| 3-inch mountain-gun, steel (Hotchkiss) | 218 | 3.766 | 13.48 | .875 | 12 | 14,560 | 870 | 63 | ------ |
| 3.2-inch light field-gun, steel | 829 | 7.56 | 26 | 3.5 | 13.5 (*a*) | 35,000 | 1,685 | 265.7 | ------ |
| 3.6-inch field-gun, steel | 1,181 | 7.79 | 23.5 | 4.1875 | 20 | 35,000 | 1,550 | 333.1 | ------ |
| 3.6-inch field-mortar, steel | 244 | 2.05 | 5.19 | 1 (maxi'm.) | 20 | 16,000 | 650 | 58.6 | ------ |
| *Siege-Artillery.* | | | | | | | | | |
| 5-inch gun, steel | 3,660 | 12.15 | 27.0 | 12.50 | 45 | 35,840 | 1,830 | 1,045 | 4.6 |
| 7-inch howitzer, steel | 3,710 | 8.475 | 12.67 | 10 | 105 | 28,225 | 1,085 | 856.9 | 3.2 |
| 7-inch mortar, steel | 1,715 | 4.86 | 7 | 5.5 | 125 | 18,000 | 690 | 412.5 | ------ |
| *Sea-coast Artillery.* | | | | | | | | | |
| 8-inch gun, steel | 32,480 | 23.21 | 32 | 125 | 300 | 37,000 | 1,950 | 7,907.5 | 14.2 |
| 10-inch gun, steel | 67,200 | 30.60 | 34 | 250 | 575 | 37,000 | 1,975 | 15,548 | 18.5 |
| 12-inch gun, steel (model 1892) | 128,719 | 40 | 37.83 | 487 | 1,000 | 38,000 | 2,100 | 30,570 | 25.1 |
| 12-inch mortar, cast-iron, steel-hooped | 31,920 | 10.75 | 9 | 80 | 800 (*b*) | 27,500 | 1,020 | 5,769.7 | 8.2(*c*) |
| 12-inch mortar, steel | 29,120 | 11.76 | 10 | 105 | 800 | 30,000 | 1,140 | 7,206.9 | 9.7(*c*) |

(*a*) For use with smokeless powder. Projectiles have been provided for this gun, weighing 16.5 pounds.
(*b*) Deck-piercing shells weighing 1,000 pounds are also provided.
(*c*) Penetration at muzzle.

Pneumatic dynamite guns of 8-inch and 15-inch caliber are mounted in two of the most important harbors, these being designed for throwing large aerial torpedoes within limited distances to damage or destroy the vessels of the attacking fleet.

It is proposed to make a type of 16-inch rifle, and this passing a satisfactory test, a limited number will doubtless be manufactured for use at a few important points, where guns of the highest power are required.

To the above should be added at least two calibers of rapid-firing guns—the six-pounder and five-inch—for use in the defense of torpedo fields and against direct attack. For flank and other defense of permanent works, Gatling guns and Hotchkiss revolving cannon of various calibers will be employed.

The latest estimate for the extended sea-coast defenses calls for the following complete armament:

Thirty-six 16-inch rifles; 203 12-inch rifles; 180 10-inch rifles; 98 8-inch rifles; 1,032 12-inch mortars; 24 10-inch mortars; 360, rapid-fire guns, together with the machine-guns and machine cannon mentioned under GUNMAKING; q.v., in these Supplements.

Of the old system, the 15-inch Rodman smooth-bore is being utilized for the protection of minor waterways and the less important coast-defenses. For this purpose its carriage has been altered for more rapid manipulation and for the firing of 450-pound solid shot with a charge of 130 pounds of modern sphero-hexagonal powder. In the same way, present use is being made of many eight-inch muzzle-loading rifles, which have been converted from 10-inch cast-iron smooth-bores by the insertion of either coiled wrought-iron or steel tubes. The projectiles fired from these are considered capable of penetrating 7.42 inches of backed armor at a distance of 1,000 yards.

The field-carriages are, in the main, constructed of steel. The stock of the gun-carriage is an exceedingly strong, built-up beam, and the entire cariage is of steel and iron, with the exception of the spokes of the wheels. Recoil is checked by the bow-spring brakes fastened to the axle, the shoes of which are placed, before firing, over the rims of the wheels.

The ammunition-chests (four for each gun,—one on carriage-limber, and three on caisson) are each adapted to carry 42 shell and shrapnel, with 44 full powder-charges, making a total of 168 rounds for each gun, the proportion being about one fourth percussion shell and three fourths shrapnel. A few rounds of canister will also be provided.

The improvements now in view in the field-*matérial* are principally the use of smokeless powder in metallic cases, the breech-mechanism being modified for more rapid manipulation, and simplified by the absence of gas-check. Aluminium alloys are being experimented with for the cartridge-cases.

The sea-coast carriages will be principally of the disappearing type, a most successful system having been devised and made applicable so far to the 8, 10 and 12 inch guns, and to all positions requiring either front or center pintle. These will doubtless render unnecessary expensive gun-lifts or turrets for use with the 12-inch caliber. Both the barbette and disappearing carriages for the above calibers are so constructed as to permit rapid and easy movement by hand. For the gun-lifts a steam-plant is necessary. See also GUNNERY, in these Supplements.

D. W. FLAGLER.
C. H. CLARK.

ARTILLERY SCHOOLS. The first school established for giving instruction was that of the Venetians in the sixteenth century. France founded a school in 1675, Saxony in 1766, the other German states following much later. In Prussia alone the artillery and engineer schools are combined. In Britain the Royal Military Academy at Woolwich, founded in 1741, prepared officers for the Royal Artillery, with a department of artillery-instruction at the institution. A separate college has since been established at Woolwich for the instruction of officers in superintendence of the manufacturing department of the royal arsenal at the same place. There is a school of gunnery at Shoeburyness.

In the United States the first artillery school was established in 1824 at Fortress Monroe, Old Point Comfort, Virginia, but was discontinued in 1830, re-established in 1858, and thence continued until the Civil War, after which it was again put into operation in 1867, when its scope was broadened. See ARTILLERY, in these Supplements.

ARTIODACTYLA, a name applied to the hoofed mammals (*Ungulata*) with an even number of toes. The axis of the foot is between the third and fourth digits. The group includes the ruminants and some omnivorous forms, as the hog and its allies. The term is the opposite of *Perissodactyla*.

ARTOCARPUS. See BREAD FRUIT, Vol. IV, pp. 241, 242.

ARTOTYPE, a photo-lithograph printed in ink. The plate from which the impressions were taken was made by a variety of the gelatin process. It is an improvement upon the albertype, and was invented by Obernetter, of Munich, in 1878. A mixture of albumen and soluble glass is used for the foundation, on which the sensitive film is subsequently placed. This film does not require to be hardened by light, so that opaque metallic plates may be substituted for the plate glass of the albertype. It is no longer in practical use, having been superseded by later and better methods.

ARTS. In the language of the universities the term *arts*, or *liberal arts*, as technically applied to certain studies, came into use during the middle ages, and on the establishment of universities the term *faculty of arts* denoted those who devoted themselves to science and philosophy, as distinguished from the faculty of theology, and afterward of medicine and law. The number of arts embraced in the full mediæval course of learning was seven: Grammar, logic, rhetoric (constistituting the *Trivium*), music, arithmetic, geometry, rhetoric (the *Quadrivium*). The terms *master* and *doctor* originally were applied synonymously to any person engaged in teaching. In process of time the one was restricted to the liberal arts, and the other to divinity, law and medicine.

ART UNIONS, institutions which have for their object the promotion of a livelier interest in and a

more liberal patronage of the fine arts on the part of the general public. They have gone far to supply the place of the encouragement formerly received from princes and prelates. The first art union established in America was founded in New York City in 1839, and had close relations with the Düsseldorf Association. It rose in 11 years to a membership of 18,960, and to an income of over $95,000. In 1849 the American Art Union was discontinued, by reason of a state law prohibiting lotteries. The lottery feature is certainly an unfortunate one, in the plan of formation of art unions, appealing to ignoble motives for a noble end. This lottery arrangement was conducted in the manner following: Each member, in return for an annual contribution fixed by the constitution of each union, received an acknowledgment which acted as his ticket in the lottery by which the works of art, purchased with the total sum thus obtained, were distributed among the members. Generally a fixed proportion of the contribution was retained and devoted to the preparation of an engraving to be presented to those who had drawn blanks in the lottery. Most associations now admit to their exhibitions the works of strangers, although the rule formerly was to admit only the product of local artists and members.

ARUBA, an island of the West Indian group, in the Caribbean Sea, lying off the coast of the Paraguana Peninsula, northern Venezuela. It belongs to Holland, being attached to the island colony of Curaçao. Its area is 69 square miles, and its population 8,065. It is one of the larger islands constituting the colony.

ARUM FAMILY (Araceæ), a family of monocotyledonous plants of which the genus *Arum* is the type. The species are herbaceous perennials, having tuberous or creeping roots, but the tropical species are often tall, rooting climbers. The inconspicuous flowers are without calyx or corolla, except as represented by scales, and are crowded upon a spadix surrounded by a spathe, which is frequently brightly colored and of curious shapes. The sexes are represented by separate flowers, the females at the base. The order includes 98 genera and about 1,000 species. They are abundant within the tropics, but only 10 species are found in temperate North America, of which the most common are *Arisæma triphyllum*, the Jack-in-the-pulpit, or Indian turnip; *Symplocarpus fœtidus*, the skunk-cabbage; and *Acorus Calamus*, sweet-flag. The latter grows in almost all parts of the earth. Of *Arum* proper there are only 15 species. Some of these grow to immense size for herbaceous plants. One (*Godwinia gigas*) discovered in the mountains of Nicaragua by Dr. Berthold Seemann, is especially remarkable. The only British species is *A. maculatum*, the wake-robin, the roots of which yield a starch known as Portland sago, or arrowroot. Many species of *Araceæ* are cultivated in greenhouses, chiefly as foliage plants, and the calla (*Richardia Æthiopica*) is a very common house-plant.

ARUNDEL, Thomas Howard, Earl of (1586–1646). See Arundelian Marbles, Vol. II, p. 671.

ARUSPICES. See Haruspices, Vol. XI, p. 500.

ARUWIMI or ARAWHIMI, the name of an important tributary of the Congo, rising in the mountains to the westward of Lake Albert Nyanza, in British territory. It flows westward, entering the Congo on its north or right bank, at which point is situated the town of Aruwimi, founded in 1884. It was explored in 1883 for 100 miles by Stanley, who advanced along its course to the relief of Emin Pasha in 1887. Its length is from 600 to 1,000 miles, its course being through a heavily timbered region. For a time it was maintained by some that the Aruwimi was the lower course of Schweinfurth's Welle, now believed to enter the Congo by the Mobangi, far to the west.

ARVAD or ARADUS, an ancient city of Phœnicia, occupying a small island of the same name (now known as Ruad), two miles from the coast of Phœnicia, near the mouth of the river Eleutherus. It is said to have been founded by the Sidonians, and was famed for the seafaring skill of its inhabitants. See Phœnicia, Vol. XVIII, p. 809.

ARVEYRON, a small tributary of the Arve, in Savoy, France, the outlet of the famous Mer de Glace, in the valley of Chamouni, from which it issues in a torrent through a beautiful grotto of ice, from 40 to 150 feet in height, known as the Ice Gates of the Arveyron. Its course is short, and it joins the Arve on its right bank, some distance above Chamouni.

ARVICOLA. See Vole, Vol. XXIV, pp. 277, 278.

ARVIEUX, Laurent, Chevalier d', a French diplomatist and Orientalist; born at Marseilles in 1635. He exhibited much tact in his negotiation of a treaty, in 1668, with the Dey of Tunis. He was consul of Aleppo from 1679 to 1686, during which time he collected materials for his *Treatise on the Manners and Customs of the Arabs*, published in 1717, —a work that was commended by Niebuhr. The pope offered D'Arvieux the honorary title of Bishop of Babylon, but he declined the honor. M. Labat compiled a book of *Memoirs of Chevalier d'Arvieux* (1735) from the papers left by the latter, referring chiefly to his travels in the Orient. He died in 1702.

ARWIDSSON, Arnold Ivar, a Swedish scholar; born at Padasjoki, Finland, Aug. 7, 1791, and became professor of history in the University of Åbo. Exiled by the Russian government in 1822, on account of some views he published in a periodical edited by him at Åbo, he proceeded to Stockholm, and became royal librarian there. In literature, he was noted for his collection of *Swedish Songs* (1834–42), and his translation of the *Icelandic Saga of Frithjof*. He died at Wiborg, Finland, June 21, 1858.

ARX, in Roman archæology, was the stronghold or chief place of a Roman city. At Rome the Arx was one of the two peaks of the Capitoline Hill, the other being the Capitolium. The Arx was the southwest height of the hill. See Vol. XX, pp. 813, 820, 824, 825.

ASA, the third king of Judah, ascended the throne at an early age. His grandmother did much harm by encouraging idolatry, but he destroyed the idols and exiled the idolators. He raised a large, well-drilled army, and when Zerah, an eastern monarch, led his forces into Judah, Asa, who had previously given his army into the care of Jehovah, met

him and put him to flight. After a period of 20 years' peace, war was again introduced into the kingdom by Baasha, the Israelite ruler, and Asa, with the aid of Benhadad of Syria, gained a complete victory. His reign lasted from 955 to 914 B.C., and at the time of his death he was loved and honored by his people.

ASABA, the capital of the Niger territories, the name of the British possessions on the West Coast of Africa, situated on the west or right bank of the Niger River, about 150 miles from the coast. At the capital resides the chief justice of the supreme court, and here are located the central prison, civil and military hospitals, and the administrative offices of the Royal Niger Company.

ASADULCIS, a drug highly esteemed by the ancients as an antispasmodic, deobstruent, and diuretic. They also believed it to possess supernatural healing powers, such as neutralizing the effects of poison, curing envenomed wounds, restoring sight to the blind, youth to the aged, etc. It sold for its weight in gold, and during the reigns of the Cyrenian princes they caused a figure of the plant producing it to be struck on the reverse of their coins, and it was sometimes called *laser Cyrenaicum*. The plant is of the genus *Thapsia*, of the natural order *Umbelliferæ*, either *T. Garganica*, or a nearly allied species, *T. Silphium*. Perhaps the drug was produced by both. They are natives of the south of Europe and of Barbary, and are active purgatives.

ASANDER, a Macedonian general, the son of Philotas and brother of Parmenion, generals of Alexander the Great. After the death of the latter in 323 B.C., Asander obtained the satrapy of Caria, in Asia Minor. In the war arising as to the divisions of the Macedonian kingdom, Asander joined Ptolemy and Cassander in their league against Antigonus, 313 B.C., but was defeated.

ASAR OR OSAR, the name given in Sweden to long, winding banks and ridges of gravel and sand, which occur abundantly in the low grounds of that country. These banks or ridges often run continuously for more than 100 miles, sometimes one dominant ridge being connected by many tributary ridges, just as a river is by its affluents. They are believed to have been formed underneath the great Mer de Glace, which covered Sweden during the glacial period, and to mark the site of subglacial streams and rivers. Similarly, gravelly ridges occur in Ireland, where they are called *esker*, and in Scotland, where they are called *kames*—a name which has been applied to the like accumulations in the northern part of the United States.

ASARABACCA (*Asarum Europæum*), a plant of the family *Aristolochiaceæ*, a native of Europe, growing in woods, but rare in Britain. The whole plant has acrid properties. The roots and leaves are aromatic, purgative and emetic, and were formerly considerably used in medicine. It is also called wild ginger.

ASBEN OR AIR, an African kingdom. See AIR, Vol. I, p. 429.

ASBESTOS is found in many portions of the United States, but until recently the best of the long-fiber article came from Canada, Italy, and Siberia. In 1893 a deposit was discovered in Montana, equal in quality to any in the world, but by reason of the inaccessibility of the mine, it cannot be profitably worked. In February, 1892, a prospector for gold in White County, Georgia, led a party to a deposit of this mineral that he had accidentally found in his quest for the precious metal. Here it exists in a remarkable form, and in amount practically inexhaustible. The Georgia mine is on Sall Mountain, a foothill of the Blue Ridge, and the asbestos forms a ledge some 800 feet in length, 250 feet in width, and extends to a depth not yet determined. This ledge is composed of pure, short-fiber asbestos, that needs only to be blasted into fragments and these disintegrated by milling. The product is a soft, fibrous substance that is ready for any of the various uses to which the short-fibered variety is put, among which may be mentioned the making of fire-proofing, adamant and quick-setting plasters, asbestos cement, asbestos paper, deadening walls and floors, roof-coating, sectional-covering for steam-pipes, retort-cement, refrigerator-insulation, electric insulation, and many other like purposes. As an instance of the revolution in prices that has been effected by the Sall Mountain deposit, it is stated that formerly a jacket for a locomotive-boiler, composed of either asbestos or magnesia, cost from $50 to $65, but one made from the short-fibered asbestos is supplied for $15. The electric-supply companies use the article for the manufacture of insulators, combining the asbestos with mica and a preparation of shellac. Fire-brick are now made, much superior in fire-resisting qualities to the ones formerly in use, by combining the asbestos with the fire-clay, and in the same way plastic stove-linings are also manufactured. Extensive mills are in operation in many places, those at Erie, Pennsylvania; Brownsville, New York, and Newark, New Jersey, especially turning out large amounts of asbestos products, which are constantly coming into more common use. See ASBESTOS, Vol. II, pp. 675, 676.

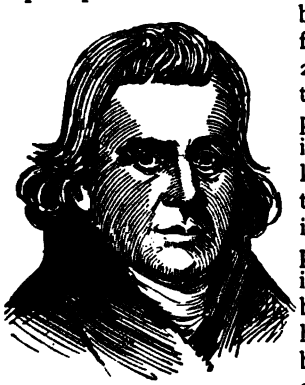
ASBJÖRNSEN, PETER CHRISTEN, Norwegian author. He was born at Christiania, Jan. 15, 1812. On leaving the university in his native city he became a tutor in the country, and during the four years thus occupied, devoted his leisure time to a thorough study of the life of the common people. In long journeys on foot he collected a rich store of materials for his future writings on folk-lore. Among his noted works of this class are *Norwegian Folk-Lore* (1842); *Tales of the Mountain Spirits* (1845–48); *The Christmas Tree Story-Books* (1850–66). The first-named he produced with the aid of Jorgen Moe. Besides the above he published *Norwegian Stories* (1871). These works achieved for him a name as a pioneer founder of the national Swedish literature. On his return to the capital he devoted himself to the study of medicine and the natural sciences. From 1846 to 1853 he was employed by the government in exploring and dredging various parts of the Norwegian coast. In the years 1849–50 he accompanied a Norwegian ship of war to the Mediterranean, visiting Asia Minor and Egypt. From 1856 to 1858 he studied forestry at Tharand, in Saxony. He was inspector of forests for the Trondhjem district, 1860–76. His scientific works

include a *Natural History* (1839–49), and a work on *Peat-Turf* (1868). He died at Christiania, Jan. 6, 1885.

ASBOLINE, a fertilizer. It is contained in wood-soot, being a highly nitrogenized oily organic compound.

ASBOTH, ALEXANDER SANDOR, a Hungarian and American soldier; born in Keszthely, Hungary, Dec. 18, 1811. He joined the Austrian army, and served with Kossuth in the Hungarian war. He emigrated in 1851 to the United States, and in 1861 offered his services to the government. He fought in numerous important battles, always acquitting himself with marked gallantry. He was twice severely wounded, the last time his left cheek-bone being broken, and his left arm fractured in two places. He rose through the successive grades to brevet major-general, March 13, 1865, resigning five months later. In 1866 he was appointed United States minister to the Argentine Republic and Uruguay, where he died from the wound in his face, Jan. 21, 1868.

ASBURY, FRANCIS, first bishop of the Methodist Episcopal Church ordained in America. He was born in Handsworth, Staffordshire, England, Aug. 20, 1745. He became at the age of 16 a local preacher, and at 22 an itinerant. Three years later Wesley sent him to America. The following year Asbury was appointed "general assistant in America." On the outbreak of the Revolution, he remained at his post, being in sympathy with the colonists, but, like all other Methodists, was looked upon with suspicion, and in 1776 was arrested and fined. The authorities becoming convinced that the "non-jurors," as the Methodists called themselves, were acting from religious and not political motives, the itinerants were permitted to resume their circuits. When an independent Methodist Episcopal Church was established in America, Asbury was unanimously elected bishop, being consecrated Dec. 20, 1784. The Methodist Church grew under his personal leadership from a scattered band of 316 members and four preachers to a powerful denomination 214,000 strong, controlled by bishops, 700 itinerant and 2,000 local preachers. He died in Spottsylvania, Virginia, March 31, 1816.



FRANCIS ASBURY.

ASBURY PARK, a small sea-coast town in Monmouth County, New Jersey, famous as a summer resort. It is situated about five miles S. of Long Branch, and is separated from Ocean Grove by Wesley Lake. The New York and Long Branch railroad has a depot here. Population 1895, 3,000.

ASCARIS, a genus of parasitic worms of the round or thread worm type (*Nematoda*). They are intestinal parasites in man and other animals. *A. lumbricoides*, which infests man, and especially children, much resembles the earthworm. As a rule these parasites cause no serious damage, but are often very troublesome.

ASCAWANA LAKE, a summer resort in Putnam County, New York. The lake is about two miles long and one mile wide. It is a picturesque spot, and much frequented.

ASCENSION, RIGHT. See ASTRONOMY, Vol. II, p. 765.

ASCHBACH, JOSEPH, a German historian; born at Höchst, Nassau, April 29, 1801; became professor of history in the University at Bonn in 1842, and in Vienna in 1853, retiring in 1872. Among his works are: *History of the Emperor Sigismund* (1838–45); *Universal Church Dictionary* (1846–50); *History of the Visigoths* (1827); *History of the Omayyads in Spain* (1829); *History of Vienna University* (1865–88). He died in Vienna, April 25, 1882.

ASCIDIANS OR TUNICATES, a group of animals which have a remarkable combination of vertebrate and invertebrate characters. They are asymmetrical, and externally resemble in shape a double-necked bottle. The larvæ resemble small tadpoles, and possess the chief characters of the vertebrate animals. One ascidian (*appendicularia*) remains at this stage. They are single or colonial, and of either sessile or free-swimming habits. They are popularly known as sea-squirts. Some are used for food in China. See VERTEBRATA, Vol. XXIV, pp. 178, 188.

ASCIDIUM, in botany, is a name applied to certain peculiarly modified leaves, which form pitchers, urns, etc., as in *Nepenthes*, *Sarracenia Darlingtonia*, etc. These pitchers are often furnished with a lid, and contain a watery secretion, to which insects are lured by trails of sugar-secretion, and are drowned, their escape being prevented by downwardly pointing hairs. The captured insects are either macerated (as in *Sarracenia*), or regularly digested by the pouring out of a digestive secretion into the pitcher (as in *Nepenthes*). The organic food thus obtained is used to supplement the ordinary inorganic food common to green plants. In the Southern United States *Sarracenia variolaris* is a noted "fly-catcher."

ASCITES, a form of dropsy. See DROPSY, Vol. VII, p. 472.

ASCLEPIADACEÆ, a chiefly tropical family of dicotyledons, closely allied to *Apocynaceæ*. They are herbs and shrubs and almost always possess milky juice, hence called "milk-weed family," which is sometimes poisonous. Some varieties are prized by florists, notably the fragrant *Stephanotis*, as well as species of the curious genus *Ceropegia* and *Hoya carnosa*, the "wax-flower." A number are medicinal, and the down of the seeds is sometimes employed as a substitute for silk or cotton. The stems of of not a few species afford useful fibers. There are many species native in North America. The characteristic structure of the family is the peculiarly modified set of stamens, which form a tube about the carpels, and develop at the back of each anther a spur or hood, often containing a horn. This device for cross-pollination by insects is correlated with the occurrence of the pollen in masses (*pollinia*), which are bodily transferred from their pouches to the stigmas of other flowers.

ASCLEPIADEAN METER, a meter invented by Asclepiades, a lyric poet of the second century B.C. There are two varieties—the lesser and the greater Asclepiad; the former consisted of a spondee (– –) and two choriambi (– ⏑ ⏑ –); the latter of three choriambi and an iambus. Horace, the Roman poet, used this form of meter in his verse.

ASCLEPIAS, known as "milkweed," or "silkweed," is the type of the family *Asclepiadaceæ*. The corolla is wheel-shaped and reflexed, the "crown" fleshy, and each of its hoods has a horn. The species are generally upright, seldom climbing and twining, herbaceous plants, with opposite, whorled or alternate leaves. They are mostly American. The flowers are disposed in simple umbels between the leaf-stalks. The roots of several North American species are used as diaphoretics and expectorants, as *A. incarnata*, *A. tuberosa*, etc.

ASCOLI, GRAZIADIO ISAIA, Italian philologist; born at Görz, July 16, 1829, of Jewish parentage. He was destined for a mercantile career, but early devoted himself to the study of comparative philology. He was the first to attempt to trace a linguistic connection between the Semitic and Aryan languages, which theory has exercised philologists not a little. His *Studj Orientali e Linguistici* procured him, in 1861, a chair of philology at the Milan Academy and besides founding the *Archivio Glottologico* (1873), in which his researches into the Romance tongues, Celtic speech, and other studies originally appeared, he has published *Fonologia Comparata del Sanscrito del Greco e del Latino* (1870), *Studj Critici* (1861–77), etc.

ASCOLI DI SATRIANO, a town in the province of Foggia, compartimento of Apulia, Italy, on the east slope of the Apennines, 25 miles S.W. of Foggia and 65 miles N.E. of Naples. Anciently it was known as Asculum Apulum, and near the ancient site Pyrrhus defeated the Romans 279 B.C. Here also the famous Crusader Tancred defeated Henry VI of Germany, A.D. 1190. Remains of the ancient Appian Way can yet be traced near the town. Population in 1891 was about 10,000.

ASCOMYCETES. See FUNGUS, Vol. IX, pp. 833–835.

ASCOT HEATH, a racecourse in Berkshire, England, 29 miles S.W. of London. The races, which take place annually early in June, are generally attended by the royal family in semi-state. From the accounts of the Master of Horse for the year 1712 it appears that they were instituted, not in 1727, as is commonly supposed, but by Queen Anne, Aug. 6, 1711. See Vol. XII, p. 202.

ASCUTNEY MOUNTAIN, in the eastern part of Windsor County, southern Vermont, about 30 miles S.E. of Rutland. Its rocky summit is 3,328 feet above sea-level. At its base, on the north, flows Mills River, and on the south the Sugar River. The village of Ascutneyville is situated at its southeastern base. A splendid panorama of the surrounding country is obtained from its summit.

ASEPTOLIN, an animal fluid of aseptic property. It is a compound devised to cure consumption by the method of hypodermic injection. Dr. Cyrus Edson, of New York City, was its inventor, and published the formula in February, 1896, after the drug had been tested successfully in a number of cases. Its characteristic constituent is phenol, an ingredient which Dr. Edson observed to be present in animals in larger proportion when they are suffering from disease than at other times, and to which he therefore attributed curative power. The composition of aseptolin is water, 97.24; phenol, 2.74; and pilocarpine-phenyl-hydroxid, 0.018 per cent.

ASES, properly *Æsir*; q.v., Vol. I, p. 209.

ASGILL, SIR CHARLES, BART., a British soldier; born in 1763. He served under Cornwallis in America, was captured at Yorktown in 1781, and selected by lot to be hanged in retaliation for the killing of an American officer by a party of English, but was saved through the direct intercession of the French court. In 1793, under the Duke of York, he aided in suppressing a rebellion in Ireland. He attained to the rank of general, and died in 1823.

ASHANGO, a native tribe of western equatorial Africa, inhabiting a thickly wooded plateau south of the Ogowé, 230 miles from the Atlantic coast. The tribe is broken up into several subtribes, all being great slaveholders and very superstitious. Du Chaillu treats of them in his book, *Ashangoland*. The most interesting subtribe is the Obongo, a race composed of hairy, yellow-skinned dwarfs, whose average height is not more than 4 feet 4 inches.

ASHBORO, a village and capital of Randolph County, west-central North Carolina 44 miles, by rail S. of Greensboro on the Southern railroad. The village has two seminaries and machine and agricultural works. Population, 510.

ASHBOURNE, a market town in the Peak district of Derbyshire, England, 13 miles N.W. of Derby. Its church, built A.D. 1241, has a fine spire, 212 feet high, and an exquisite monument by Banks. It was here that Thomas Moore wrote the greater part of *Lalla Rookh*. Population, 3,810.

ASHBOURNE, EDWARD GIBSON, LORD, a British statesman; born at Dublin in 1837, and graduated at Trinity College with high honors. He was elected to Parliament for Dublin University in 1875, and two years later was made attorney-general for Ireland. In 1885 he was raised to the peerage as Baron Ashbourne and became lord chancellor of Ireland, which office he held in Lord Salisbury's successive administrations.

ASHBURTON, ALEXANDER BARING, LORD, statesman; born in England, Oct. 27, 1774. He was sent to America by his father, Sir Francis Baring, in the interests of the mercantile house of Baring Brothers and Company, and in 1798 he married the eldest daughter of Senator William Bingham, a wealthy merchant of Philadelphia. Shortly after his marriage, Alexander returned to England, and on the death of his father in 1810, became head of the firm. Two years later he was elected to Parliament. In 1835 he was made a peer by the title of Lord Ashburton, and in 1841, on account of his familiarity with the institutions and people, he was sent as special minister to the United States to negotiate a treaty adjusting the northeastern boundary, which resulted in the famous Ashburton Treaty, concluded at Washington, Aug. 9, 1842. On his

return to England he was tendered a vote of thanks by the British Parliament for this service, and was offered an earldom, but he declined the honor. He died at Longleat, the seat of the Marquis of Bath, May 13, 1848.

ASHBURTON RIVER, an unnavigable stream of western Australia, rising in the mountains west of the Great Desert, and flowing 400 miles northwestward into Exmouth Gulf. Its lower course was explored by Sholl in 1866, its upper by Giles in 1876.

ASHBY, TURNER, a Confederate general, born at Rose Hill, Virginia, 1824. On the outbreak of the Civil War he raised a cavalry regiment, in the command of which he distinguished himself by the bravery of his conduct. He attained the rank of brigadier-general. He was killed in a skirmish previous to the battle of Cross Keys, Virginia, June 6, 1862, while covering the rear of General Jackson during the pursuit by General Banks.

ASHE OR ASSHI. See ASCHE, Vol. II, p. 679.

ASHERA, the name of a Phœnician goddess. See BAAL, Vol. III, p. 176.

ASHES, in chemical phraseology, the remains of animal and vegetable bodies after burning. The ashes of organic substances destroyed by fire consist of the fixed salts contained in these substances. In land-plants the most important are salts of potash, along with silica and lime; in sea-plants, soda takes the place of potash, while iodine is also largely present. By the process of leaching, or lixiviation, the potash or soda is dissolved, and so separated from the useless insoluble mass, and can then be purified by crystallization. Wood-ashes are an important commercial product, and are valuable in soap-boiling, bleaching, dyeing, glass-making and other industries. The chief source of animal ashes is bone, the burnt remains of which contain lime, an essential element, and phosphoric acid. The bone phosphates constitute a highly valuable source of agricultural fertilizer, especially useful in grain-raising.

ASHEVILLE, capital of Buncombe County, western North Carolina, located in the midst of the Blue Ridge Mountains, near the French Broad River. It is the central point on the Southern railroad system, 210 miles W. of Raleigh. It is the seat of Asheville College for Women, a Methodist institution founded in 1843. The town is famous as a health-resort and possesses many fine villas, built by people of means, who make it their residence part of the year. It is the headquarters of an extensive trade in tobacco and miscellaneous manufactures. Here Edgar William Nye ("Bill Nye") died, Feb. 22, 1896.

ASHKENAZIM, the name of a northern people mentioned in the table of races given in Gen. x, located in Armenia, or in its neighborhood. The later Jews identified it with Germany. See JEWS, Vol. XIII, p. 683. Also JUDAISM IN THE UNITED STATES, in these Supplements.

ASHLAND, capital of Clay County, northeastern Alabama, in the center of the county, about 6 miles N.E. of Crawfords, on the Hollins, Heflin and Sylacauga railroad. Population 1890, 635.

ASHLAND, a town in the southeastern corner of Cass County, western Illinois, on the Chicago and Alton railroad, 200 miles S.W. of Chicago and 46 miles N.W. of Springfield. The principal industry is coal mining; also grain and live stock are shipped. Population 1890, 1,045.

ASHLAND, capital of Clark County, west-southern Kansas, on the Atchison, Topeka and Santa Fé railroad, about 165 miles by rail S.W. of Wichita. It is in the center of an agricultural region, and manufactures concrete plaster. Population 1890, 1,159.

ASHLAND, a town in Boyd County, northeastern Kentucky, on the left bank of the Ohio River, near the Big Sandy, 5 miles N. of Catlettsburg by rail. Coal is mined in the vicinity, and there are in the town extensive blast-furnaces and rolling-mills, while large shipments are made of pig-iron, coal and manufactured products from its rolling mills, nail-mills and furniture factories. Population 1890, 4,195.

ASHLAND, a town in Middlesex County, east-central Massachusetts, on the Boston and Albany railroad, 24 miles S.W. of Boston. It is the terminus of the Hopkinton branch of the New England railroad, which connects it with Providence, 41 miles distant. Its chief manufactures are carriages, shoes and paper. Population 1890, 2,532.

ASHLAND, capital of Benton County, northern Mississippi, situated in the center of the county. Population 1890, 138.

ASHLAND, a town in Saunders County, central-eastern Nebraska, on Salt Creek, near the Platte River. It is 21 miles S.W. of Omaha and 24 miles N.E. of Lincoln; has an immense water-power for the manufacture of machinery and mill products, and is extensively engaged in the quarrying of limestone. Population 1890, 1,601.

ASHLAND, capital of Ashland County, north-central Ohio, on the New York, Lake Erie and Western railroad, 54 miles S.W. of Akron. It has good educational facilities, and is the seat of Ashland University. Population 1890, 3,156.

ASHLAND, a town in the southern part of Jackson County, southwestern Oregon, on the Southern Pacific railroad, 341 miles S. of Portland. It is beautifully situated in the midst of a fertile fruit region. It is the seat of a state normal school, and is noted for its mineral springs and quartz-mines. Population 1890, 1,784.

ASHLAND, a town in Schuylkill County, east-central Pennsylvania. It is situated on the Philadelphia and Reading railroad, 119 miles N.W. of Philadelphia. It depends principally upon its rich mines of anthracite coal, but it has also foundries, machine-shops and mills. Population 1890, 7,346.

ASHLAND, capital of Cheatham County, west-central Tennessee, situated on the Cumberland River, about 30 miles N.W. of Nashville. Population 1890, 358.

ASHLAND, a town in Hanover County, east-central Virginia, about 15 miles N. of Richmond, on the Richmond, Fredericksburg and Potomac railroad. It is the seat of Randolph-Macon College, founded in 1832, a Methodist institution. Population 1890, 948.

ASHLAND, a city and capital of Ashland County, northern Wisconsin, on Chequamegon or Ashland Bay, about 250 miles N. of Milwaukee. Four railroads enter the city: the Chicago and North-Western, the Chicago, St. Paul, Minneapolis and Omaha, the Wisconsin Central, and the Northern Pacific. Large industries are carried on in lumber, iron and stone. Its ore-docks have a capacity of 100,000 tons and it ranks fifth as a port on the Great Lakes. In 1895 the value of lumber, shingles and lath manufactured was $1,252,380; the value of iron products and manufactured articles of iron was $443,480. Population 1890, 9,956; 1895, 12,310.

ASHLAR OR ASHLER, a form of masonry. See BUILDING, Vol. IV, p. 471.

ASHLEY, a town in the eastern portion of Washington County, southwestern Illinois, situated at the crossing of the Illinois Central and Louisville and Nashville railroads, 266 miles S.W. of Chicago. Agricultural produce and fruit are the staples of the district. Population 1890, 1,035.

ASHLEY, a town in Luzerne County, east-central Pennsylvania, in the Wyoming valley, where coal-mining is the great industry. Here the Central Railroad of New Jersey forms a junction with the Nanticoke railroad. Coal-cars and engines are constructed in the town. Population 1890, 775.

ASHLEY, a river of southern South Carolina, rising in Berkeley County and flowing south, first in a westerly and then in an easterly direction, falling into Charleston harbor.

ASHLEY, JAMES MONROE, an American politician; born near Pittsburg, Pennsylvania, Nov. 14, 1824, He edited the Portsmouth (Ohio) *Dispatch*, and later the *Democrat*. In 1849 he was admitted to the bar, but never practiced, becoming interested in the drug business in Toledo. In 1859 he was elected to Congress as a Republican, and served through five successive terms. He held the position of chairman of the territorial committee, it being during this period that the territories of Arizona, Idaho and Montana were organized. In 1869–70 he was governor of Montana.

ASHMEAD-BARTLETT, SIR ELLIS, a British statesman; born at Brooklyn, New York, in 1849. His father was an English clergyman. The son received his education in England, at Torquay and at Oxford University. In 1877 he was called to the bar at the Inner Temple, and entered Parliament in 1880 as member for Eye, Suffolk County. Since 1885 he has sat for the Eccleshall division of Lancashire. In two of Lord Salisbury's administrations he held the post of civil lord of the admiralty. In 1892 he was made a knight-bachelor.

ASHMEAD-BARTLETT, WILLIAM LEHMAN, brother of the above; born in New Brunswick, New Jersey, in 1851. Soon after his father's death he removed with his mother to England, where he was educated; was graduated from Christ's Church, Oxford. Through the friendship of the Baroness Burdett-Coutts to his mother, he was made the protégé of the former, and became her private secretary, in which capacity he soon developed ability in the administration of the immense charities distributed by the Baroness. The latter, believing that the interests of her philanthropic projects would be materially benefited, accepted in marriage her devoted secretary, the ceremony taking place Feb. 12, 1881, her ladyship thereby forfeiting a considerable part of her fortune. Mr. Ashmead-Bartlett entered Parliament, and was re-elected with increased majorities for the Westminster district of London in 1886 and 1892, and was returned, unopposed, at the general election in 1895. He is a supporter of the Conservative party. By royal license he assumed the name of Burdett-Coutts in addition to his own.

ASHMOLE, ELIAS, a British antiquary; born at Lichfield, England, May 23, 1617. In 1633 he commenced the study of law, and five years afterward was admitted to practice as a solicitor in chancery. During the civil wars he embraced the side of the Royalists, and was appointed captain in Lord Ashley's regiment, and comptroller of the ordnance, but at the same time exhibited his love for study by joining Brazenose College, Oxford, where he applied himself to mathematics, natural philosophy, astronomy and astrology. In 1650 he published a work by Dr. Dee, to which he subjoined a treatise of his own. In 1652 he published his *Theatrum Chemicum Britannicum*, and 20 years later his great work, a *History of the Order of the Garter*. In 1658 appeared his *Way to Bliss*, a work on the philosopher's stone. At the restoration of King Charles, various honors and emoluments were conferred upon him. In 1682 he presented to the University of Oxford a very fine collection of rarities, calling it the Ashmolean Museum. He died May 18, 1692. A diary by him was printed in 1717. See OXFORD, Vol. XVIII, p. 95.

ASHMUN, JEHUDI, an American missionary; born in Champlain, New York, in April, 1794. He graduated at the University of Vermont in 1816, and became a Congregational minister. He removed to Washington, District of Columbia, where he joined the American Colonization Society, and was made editor of the *Theological Repertory*. He took charge of a reinforcement for the colony at Liberia, on the western coast of Africa, for liberated slaves, and sailed on June 19, 1822, finding the colony in a rueful state of disorder and demoralization, and threatened by formidable enemies. He at once set about the task of reorganization, and in November repulsed the attack of 800 savages with only 35 men and boys, and defeated a much greater number a few days later with the same force. He continued his labors for six years, when he was compelled to return home on account of ill health, leaving a prosperous colony. He died a few weeks after his arrival, in New Haven, Connecticut, Aug. 25, 1828.

ASHTABULA, an important railroad center of Ashtabula County, northeastern Ohio, situated on both sides of the Ashtabula River, at its mouth. Its railroad connections are excellent, consisting of the Lake Shore and Michigan Southern, the New York, Chicago and St. Louis, and the Pittsburg, Youngstown and Ashtabula division of the Pennsylvania lines. It is 55 miles E. of Cleveland. It has a fine harbor, and, with the exception of Cleveland, receives the largest amount of iron ore and ships the most coal of any port on the lakes. Population 1890, 8,338.

ASHTON-IN-MAKERFIELD, a small town in a carboniferous district in the middle of southern Lancashire, England. The chief industries are coal-mining and cotton manufacture. Population, about 16,000.

ASHTORETH OR ASHTAROTH. See ASTARTE, Vol. II, p. 735.

ASIA. For the general description, history, etc., of this great continent, see Vol. II, pp. 683–772.

Railways are beginning to make their appearance in Asia. In India they already represent a total length of 18,855 miles. Russia, too, has spread her railways far into Asia; a military line now connects the Caspian Sea with Merv, and Merv with Tchardjui, on the Amu-daria, and by way of Bokhara on toward Samarcand. Its length is 890 miles. In the north, Perm—the terminus of steamers navigating the Kama (tributary to the Volga)—is connected by rail across the Urals with Tyumen, whence steamers ply to Tomsk, in the very heart of Siberia, and to Barnaul, in the Altai. The various sections of the great Transsiberian railway are being rapidly completed. This railway will have a total length of 4,500 miles. Russia obtained permission to build and protect a line directly east, through Chinese Manchuria, which shortens the route from Lake Baikal to Vladivostok, situated in Russian territory north of Corea. Branches from the main line of this railroad are projected chiefly to the northern portions of Asiatic Russia.

China has opened its territory to railways, but little progress has been made. A road seven miles long was built in 1890, from Shanghai to Woosung; another has been built from Kaiping to Tientsien, in the northeast, 87½ miles in length, and one of 17 miles in the island of Formosa.

Turkey has 1,000 miles of railway in Asia, which are of importance commercially. Persia has only 30 miles, but Palestine has already 169 miles. Japan has 1,864 miles, and is continually adding to its mileage.

Notwithstanding the difficulties of communication, a brisk trade is carried on between the different parts of Asia, but there is no possibility of arriving at even an approximate estimate of its aggregate value. The exports maritime to Europe, the United States and overland to Russia reached, in 1890–91, a value of nearly $875,000,000, and the imports about $625,000,000.

Hitherto Asia has supplied Europe chiefly with raw materials—gold, silver, petroleum, teak, and a variety of timber wood, furs, raw cotton, silk, wool, tallow, and so on; with the products of her tea, coffee and spice plantations; and with a yearly increasing amount of wheat and other grain. Steam industry is only now making its appearance in Asia, and although but a very few years old, it threatens to become a rival to European manufacture. Indian cottons of European patterns and jute-stuffs already compete with those of Lancashire and Dundee. Several of the petty trades carried on in India, China, Japan, Asia Minor and some parts of Persia have been brought to so high a perfection that the silks, printed cottons, carpets, jewelry and cutlery of particular districts far surpass in their artistic taste many like productions of Europe. The export of these articles is steadily increasing.

ASIATIC SOCIETIES have been in existence for over a century, and were founded for the purpose of promoting research into the language and literature, ethnology, history and sciences connected with the various Asiatic countries. The first of the kind was formed by the Dutch at Batavia in 1780. Four years later the famous Sir William Jones founded the Royal Asiatic Society of Bengal at Calcutta; in 1822 the Société Asiatique was formed at Paris; the following year the Royal Society of London was organized; the German Oriental Society was formed in 1845; the Italian Asiatic Society in 1887, and the American Oriental Society in 1842. The Asiatic Society of Ceylon, formed in 1845, the Asiatic Society of China, formed in 1847, and the Asiatic Society of Japan, formed in 1872, together with the Literary Society of Bombay and Madras, are branches of the Royal Asiatic Society of London. It has been chiefly through these societies, by papers read at their meetings, as well as by the publication of original communications in the various journals promoted by the societies, that the marked progress that has been accomplished in Asiatic research is due. A new scope was given to Asiatic research by the discoveries made among the ruins of ancient Babylon and Nineveh. These latter discoveries have done a great deal to correct and supplement the philological and other discoveries of earlier periods in the history of Asiatic explorations.

ASIENTO, the Spanish name for a contract or treaty, which received a special significance on being applied to the contract entered into between Spain with other powers, according to which the Spanish government bestowed upon such, under certain conditions, the monopoly of supplying negroes for its American colonies. The first Spanish monarch to grant an asiento was the Emperor Charles V (1517–55), to the Flemings. The Genoese secured the privilege in 1580, the Portuguese in 1696, the French in 1701, and the British in 1713. The British government disposed of its rights to the South Sea Company, and in 1748 this company disposed of its rights for the four years yet to run, upon payment by Spain of $500,000, together with certain commercial advantages. Since 1748 the contract has not been renewed.

ASINALUNGA OR SINA LUNGA (ancient Ad Mensulas), a town of Tuscany, in the province of Siena, northern Italy, about 20 miles S.E. of Siena by rail. It is beautifully situated on hills bordering the Val di Chiana. It is a well-built town with wide and well-paved streets, and possesses a handsome collegiate church, in which are many fine paintings. Population, 8,958.

ASINARII, in religious history, worshipers of the ass. The word was applied as a nickname originally to the Jews, and later to the early Christians. To be compared to the ass in early times in the Orient was not a disgrace, but an honor, as the wild ass was there the embodiment of grace and speed, the name being found in conjunction with those of rulers themselves. In the Occident, the ass being

an inferior type, the term, applied to Christians, became correspondingly a term of reproach according as the animal was despised.

ASIRGARH, a strong fortress in the central provinces, 300 miles N.E. of Bombay, commanding a pass between the Deccan and Upper India. It stands on an isolated mountain of the Satpura range, 850 feet above the base. It has been twice captured by the British, in 1803 and 1819.

ASKABAD, a town of Russian Turkestan, important as the political center of Transcaspia, situated on the Transcaspian railway, 290 miles S.E. of Mikhailovsk, the seaward terminus. It was occupied by the Russians in 1881. Population, about 7,000.

ASKALON OR ASKELON. See ASCALON, Vol. II, p. 676.

ASKJA, the largest volcano in Iceland, rising out of the vast Odadahraun lava desert, near the center of the island. Its vast crater is over 23 square miles in area, and about 17 miles in circumference. Almost circular in shape (hence its name, which means *a basket*), it lies at a depth of over 700 feet within a mountain built up by a distinctly marked series of lava-flows, round a volcanic rent, to a height of 4,633 feet above the sea. Great volumes of steam are belched forth from numerous rifts and rents, and the whole surface is a chaos of rugged lava floods, except in the southeast, where there is a hot-water lake five miles in circumference, and a tract covered with pumice ejected in 1875. This great eruption first called general attention to Askja, and it has been stated that the volcano was only then formed; but the traces of innumerable earlier eruptions are found in the walls of the crater already referred to, where the divisions are marked by the layers of red, slaglike lava, which time after time has formed the surface of the underlying lava strata. Most of the lava in this eruption found an outlet, not from the crater, but some miles to the northeast, where a bed 20 miles long and 7 broad now lies.

ASMONÆANS, a Jewish princely family. See ASMONEUS, Vol. II, p. 714.

ASNYK, ADAM, a Polish dramatic author; born at Kalisz, Sept. 11, 1838, studied medicine at Warsaw and Breslau; took part in the insurrection of 1863, and after its failure returned to Heidelberg, receiving the degree of doctor of philosophy in 1866. He then visited the west of Europe and Italy. He is regarded as one of the most graceful of modern Polish writers, and is the author of *Mademoiselle Léocadie* (1868); *Le Branche d'Heliotrope* (1868); *Cola di Rienzi* (1879); and *Kiejstutt, Prince de Lithuanie* (1878).

ASOCA, an Indian tree of the family *Leguminosæ*, remarkable for the beauty of its red and orange flowers. The *Asoca* is often mentioned in Indian poetry, and is connected also in various ways with the Hindu mythology.

ASOCA, king of Behar, and reformer. See INDIA, Vol. XII, p. 784.

ASOTIN, a village and capital of Asotin County, southeastern Washington, at the junction of the Asotin Creek with the Snake River, about 10 miles S. of Lewiston, Idaho. Population 1890, 200.

ASPARAGIN, a crystalline compound which exists ready-formed in common asparagus, marshmallow, potatoes, chestnuts, liquorice-roots, and the young shoots of peas, beans, etc. Chemically considered, asparagin is regarded as the amide of asparatic acid, and forms compounds with acids and alkalies.

ASPARAGUS-BEETLE. The asparagus-beetle (*Crioceris asparagi*) was accidentally introduced into Long Island, New York, from Europe in 1860. This beetle is blue-black, but its thorax is brick-red. The wing-cases have various markings on their sides. The insect passes the winter in the beetle state. When the asparagus shoots up in the spring the beetle comes forth from its winter quarters and lays its eggs on the crevices of the tip, which it also feeds upon. After being hatched out the brood of larvæ eats the tender parts of the plants. The beetle also denudes the plants of its green bark or covering. At the end of June the larvæ hide under some rubbish or in the loose ground, form slight cocoons there, pass into the pupa state, produce a second brood of beetles, which lays its eggs in the middle of August. A third cycle ends in September with a brood of beetles destined to reproduce the species in the following spring. These pests at one time nearly destroyed the Long Island asparagus-culture, but in 1863 a deliverer appeared in the form of a small, shining, black parasitic fly. This fly lays its eggs in the larvæ of the asparagus-beetles and destroys them. By keeping all the shoots cut below the ground at the season for the beetle's first appearance, the farmer is able to reduce the mischief done by this bug.

ASPASIA THE YOUNGER, a Phocæan woman, daughter of Hermontimus, the favorite concubine of Cyrus the Younger, who named her Aspasia, after the favorite of Pericles, her former name having been Milto, which referred to her brilliant complexion. On the death of Cyrus at the battle of Cunaxa, in 401 B.C., she became the captive and later the favorite of Artaxerxes. The son of the latter, Darius, begged his father to surrender her to him, his father complying; but the father, obtaining her again, made her a priestess of a temple at Ecbatana, where celibacy was enforced.

ASPE, a romantic valley in the department of Basses-Pyrénées, southeastern France, close to the Spanish frontier. It has a population of 12,000, and was formerly a republic under the protection of the princes of Bearn.—ASPE is also the name of a town of Valencia, Spain, in the province of Alicante, with a trade in oil, soap, marble and brandy. Population, 7,476.

ASPECTS, in astronomy, certain positions of planets with respect to one another, as seen from the earth. In the days of astrology, there were five aspects: conjunction, sextile, quartile, trine and opposition. Two planets are in conjunction when they have the same longitude; their aspect is sextile when they are 60° apart; quartile when the distance is 90°; trine when it is 120°, and at 180° they are opposite each other, or in opposition. The only two of the terms now in use are *conjunction* and *opposition*. The term was introduced by the astrologers, and was in use in England in the

fourteenth century. The astrologers believed that the aspects had an influence on human affairs which was either benign, malignant or indifferent.

ASPEN, capital of Pitkin County, west-central Colorado, situated in a valley surrounded by mountains on Castle Creek, and at an elevation of nearly 7,700 feet above the sea-level. It is the center of a rich lead and silver-mining industry. Population 1890, 5,108.

ASPERGILLUM, a genus of mollusks found in the South Seas. The shell has the form of an elongated cone, the larger end expanded into a disc which is pierced by small holes. Hence they are known as watering-pot shells. See MOLLUSCA, Vol. XVI, p. 687.

ASPERGILLUS, a generic name formerly applied to certain "molds" occurring on dead organic matter, preserved fruits, etc. *Aspergillus* has been found, however, to be but a phase (the conidial form) of *Eurotium*, to which genus the species are now referred. *E. glaucum* is the common mold found in herbaria upon imperfectly dried specimens.

ASPERN OR GROSS ASPERN, a village of Austria, on the left bank of the Danube, 5 miles E.N.E. of Vienna. This village and the neighboring one of Essling are celebrated as the scene of a sanguinary battle, in the summer of 1809, between the Austrian and French armies, the latter commanded by Napoleon I. See AUSTRIA, Vol. III, pp. 133, 134.

ASPHODEL, a general name for species of the genus *Asphodelus* of the family *Liliaceæ*. They are mostly natives of the countries around the Mediterranean, and are either fibrous-rooted or bulbous-rooted. *A. luteus*, the "yellow asphodel" or "king's-spear," is the handsomest and best-known species. The asphodel of the earlier English and French poets is the daffodil (*Narcissus Pseudo-narcissus*).

ASPIDIUM, a large genus of fern, distributed everywhere, known as the "shield-fern." The common name refers to the fact that round clusters of sporangia (*sori*) are covered by a roundish, shield-like indusium. They vary widely in the character of their fronds. The genus is of uncertain limitation, sometimes being broken up into two or more genera.

ASPIDICHTHYS, a genus of fossil fishes found in Devonian formations. They are characterized by a broad dorsal plate studded with large tubercles.

ASPINWALL, WILLIAM H., a New York merchant, leader in the construction of the Panama railroad; born in New York City, Dec. 16, 1807; died there Jan. 18, 1875; retired in 1850 from the firm of Howland and Aspinwall, which had been engaged in shipping, and became engaged with others in the construction of the Panama railroad, the northern terminus of which was named Aspinwall, after him, and was at one time a seaport of considerable importance. He retained his connection with the steamship line, running between California and the Isthmus of Panama, acting as its president until 1856.

ASPIRATOR, an instrument or apparatus used for producing a vacuum, and thus causing a suction-current. It varies in form; is used in chemistry in the examination of gases to cause a current of gas to flow through a tube; in mining, for ventilating; in surgery, for removing the fluid matter of tumors, serous effusions and collections of pus, and in the cooling and cleaning of grains. The instrument used in chemistry and the basis of the more complicated surgical forms is that of a tube or vessel filled with water and connected with the object to be drained. On permitting the water to escape below, a partial vacuum is formed above which sucks the gas out of its receptacle. See PLEURISY, Vol. XIX, p. 223; and MINING, Vol. XVI, p. 461.

ASPLENIUM, the largest genus of ferns excepting *Polypodium*. The species are widely diffused, both in the northern and southern hemispheres. The sori are linear or oblong, lying on the veins, the indusium being attached at one side. They are of various habit, some of them being of great delicacy and beauty, being known generally as "spleenworts."

ASPROMONTE, a mountain in the southwestern part of Italy, about 16 miles from Reggio, forming the extremity of the southern Apennines, and overlooking the Strait of Messina. The summit, Montalto, is 6,907 feet above sea-level. It was here that Garibaldi was defeated and captured, Sept. 29, 1862, by Pallavicini. See ITALY, Vol. XIII, p. 491.

ASPROPOTAMO, a river of Greece. See ACHELOUS, Vol. I, p. 94.

ASQUITH, HERBERT HENRY, a Liberal leader in the English House of Commons; born at Morley, England, Sept. 12, 1852; graduated at Oxford, Balliol College, in 1874; called to the bar in 1876; elected to parliament from East Fife in 1886, and again from the same district in 1892; appeared as one of the counsel in behalf of Mr. Parnell before the Parnell commission; appointed queen's counsel in 1890; appeared for the defense in the "Baccarat" trial in 1891. He was appointed home secretary in Mr. Gladstone's cabinet formed in 1892, retiring with the defeated Rosebery ministry in 1895. He took a prominent part in the labor disputes of 1893 and 1894, his course being approved by the House and the public generally.



HERBERT HENRY ASQUITH.

ASSAB, a bay on the Red Sea, near the Strait of Bab-el-Mandeb, in lat. 13° N., long. 42° 50′ E. The name is also applied to a town and its surrounding territory located on the bay. The bay, which is full of islands, is 16 miles long by 5 wide. The town is located near the mouth of the bay, and contains, with its adjacent territory, 6,800 inhabitants. An Italian steamship company bought the town and bay in 1870 from the native chieftains, and used it for a coaling-station until 1880, when the Italian government assumed control and included it in the colony of Eritrea.

ASSAL, an important salt lake in the east of Africa, 25 miles S.W. of Tajurrah, the chief seaport on the Gulf of Aden, lat. 11° 40′ N., long. 42° 40′ E.; 760 feet below sea-level; eight miles in length, four miles in breadth. Abyssinian caravans resort to it for the purpose of carrying off the salt which incrusts its shores, like ice, sometimes to the depth of half a foot.

ASSASSINATION is the crime of murder, committed without immediate provocation, and without resistance from the person upon whom the crime is committed. It is a murder committed treacherously, without warning or notice, and is usually committed for hire or revenge, or is the result of mental aberration. A person guilty of this crime is termed an assassin. See ASSASSINS, Vol. II, p. 722.

ASSATEAGUE, a bay and island, the southern part being included in Accomac County, Virginia, the remainder of both being under the jurisdiction of Maryland, and known as Chincoteague. The bay extends along the greater part of the Atlantic coast of Maryland, and about 10 miles along the Virginia shore. The island, extending from Chincoteague Inlet, at which point a lighthouse stands, 15 miles N., lies seaward of Chincoteague waters and separates the bay for two thirds of its length from the ocean. Behind it the waters are a harbor of refuge for vessels in the coast trade. The island is sparsely inhabited, fishing being the chief occupation of the people.

ASSEGAI, a slender spear of hardwood tipped with iron, used in battle by the Zulus of South Africa, and other savage tribes. The larger kind is held in the hand and used as a lance or spear, while shorter ones are thrown as javelins were of old.

ASSEMBLY is a convention or body of men gathered for some definite purpose. The term is generally applied to conventions of politicians or religious organizations. The legislatures of New York and Massachusetts are known as the General Assembly; in other states, as New Jersey, the lower house receives the name. The General Assembly is the highest judicatory of the Presbyterian churches in Scotland, Ireland and the United States. National Assembly, in French history, is the States-General convened in June, 1789, as it was organized by the third estate, to which a few of the noble and clerical orders adhered. It assumed the name for a few days and then resolved itself into the Constituent Assembly, that gave to France her first constitution. The clergymen who were convened in Westminster Abbey in 1649, and drew up the Westminster Catechism and Confession of Faith, the standards of Presbyterian churches, called their convocation an Assembly. An unlawful assembly is a gathering of three or more men bent on performing or on aiding the performance of some unlawful act.

ASSESSMENT is the valuation of property, income or profits for the purpose of taxation, made by authorized persons according to their discretion. The term *special assessment* is made use of in the United States to describe the adjustment of the charges or contributions levied against the property of several persons for the purpose of accomplishing or maintaining some object of common benefit. Such assessments are made according to the benefit to be derived by the parties contributing. This class of assessments is of frequent use in making public ditches, where the benefit is received only by those whose property is drained thereby, and in cities for the purpose of raising funds for the improvement of streets and sewers and making other local improvements. The assessment is made only against those who are benefited directly or indirectly by the improvement. Assessment of damages is fixing the amount of damages which should be awarded to the successful party in a suit, and is generally done by a jury, or if the case is tried without a jury, the court assesses the damages.

ASSESSOR. In addition to the general use of the word (as to which, see ASSESSOR, Vol. II, p. 728), the term *assessor* has a special meaning, in the United States, when used to describe a township officer whose duty it is to make assessments. One who is authorized by law to make valuations upon property for the purposes of taxation is termed an assessor. The duties of an assessor of property for purposes of taxation are generally defined by statute. As a rule, it is necessary that the assessor obtain from each person in his district, owning taxable property, a complete list of his personal property, and ascertain its condition and value, so that he may set a fair and equitable valuation thereon. He has a like duty to perform as regards each person's real estate, though in practice the lists are usually made up from the official records of the county. From the valuation placed upon the property thus listed the taxes are calculated according to a standard provided by law.

ASSETS, according to the modern signification of the term, mean the property of every kind belonging to a merchant, business association or estate, from which indebtedness, if any exists, may be paid, or through which business may be carried on, or other objects attained which require the aid of property or funds.

Assets in hand are such as are capable of being put to immediate use. Equitable assets are those which are not in condition to be reached by a creditor except through a court of equity. Personal assets are those classed as personal property, and which would pass to an executor or administrator upon the death of the owner. Real assets are landed property, or such assets as would descend to the heirs.

In the United States all the assets of a debtor are subject to the payment of debts upon execution, except the goods and articles protected by the homestead and exemption laws of each state. The order in which the assets of a deceased person must be applied to the payment of debts, except where otherwise provided by statute, and in the absence of special directions in his will, is as follows: 1. The personal assets not expressly bequeathed. 2. The land devised for the payment of debts, if such devise is made. 3. The real estate descending to the heirs, but not charged with debts. 4. Real estate devised, charged with the payment of debts, subject

to such charge. 5. General pecuniary legacies, contributing *pro rata*. 6. Real estate devised, and not charged with debts. Generally, throughout the United States, the wearing apparel of widows and minor children are not considered assets of the deceased's estate, and in many states by statute the widow and children are entitled to an allowance from the estate to meet their immediate needs, in preference to creditors. See ASSETS, Vol. II, p. 729.

ASSHUR, ASUR, ASHUR OR ASSUR, the ancient capital of Assyria, located on the Tigris, 60 miles S. of Nineveh. The name is the Hebrew form for Assyria, and in Biblical ethnology is derived from that of a grandson of Noah. See NINEVEH, Vol. XVII, p. 512.

ASSHURBANIPAL OR ASSUR-BANIPAL, an Assyrian king. See BABYLON, Vol. III, p. 188.

ASSIGN is a legal term used to indicate generally the transfer of property, but more particularly the transfer of movable property and personal rights. The word is also applied to the persons to whom the transfer is made.

ASSIGNATS, notes issued on Sept. 9, 1790, by the French government on the security of national lands. They began with an issue of 400,000,000 livres, or about $80,000,000. New issues rapidly followed, until, it is said, the total amount represented $9,115,600,000. The notes were mostly for 100 livres each, although some were for smaller amounts, and were used by the people as currency. In three years the value of assignats had sunk to one third of their face. In July, 1796, these currency-notes having become wellnigh worthless, the government recalled them, replacing them with a new currency, called mandats, at the rate of 1 to 30, thus wiping out an enormous and hopeless public debt by a process of repudiation. See FRANCE, Vol. IX, p. 601.

ASSIGNMENT is a transfer or turning over to another, of some property, or right therein. An assignment is usually in writing, but may frequently be made by mere delivery. The words technically used in assignment are "assign, transfer and set over." Generally, every demand connected with property, and every interest therein, may be assigned. An extensive class of assignments are those made by insolvents, assigning all their property to some one, in trust, for the payment of their debts. Such assignments, made for the benefit of creditors, are governed by statute in most of the states of this country.

ASSIGNMENT OF DOWER is the act by which the share of a widow in her deceased husband's estate is determined and set apart for her.

ASSIGNMENT OF ERRORS is the statement of the party appealing to a higher court, in which he sets forth the errors charged against the lower court.

ASSIMILATION, IN PLANTS. The term *assimilation*, as used in plants, is capable of various limitations. The work of green (chlorophyll-containing) plants cannot be placed in the same category as that of plants without chlorophyll, as fungi. In general, the term has been applied to the changes which take place in food-material from its absorption to the formation of protoplasm; that is, the work of anabolism, so far as it pertains to food. In green plants this process is divisible into two distinct stages; viz., the chlorophyll-assimilation, by which, under the influence of light, the chlorophyll-containing cells convert absorbed carbon-dioxid ($CO^2$) and water ($H^2O$) into a carbohydrate, an organic substance; and the ordinary assimilation, common to all plants and animals, by which organic material is gradually built up into protoplasm. As the two processes are so distinct, it is becoming customary to apply the term *assimilation* in plants, only to that part of the general process which is common to all organisms, and to apply the term *photosyntax* to the very distinct chlorophyll-assimilation of green plants.

J. M. C.

ASSINIBOIA. See NORTHWEST TERRITORIES, in these Supplements.

ASSINIBOIN, a family of the Dakota Indians in the United States and British America, on the Montana border. They were once a part of the Yankton Sioux nation, but separated from them nearly 300 years ago, and since then have generally been their antagonists. Among tribesmen the name is not used, other Indians calling them Stone Sioux, or Assinipwalak. There are about 3,000 in the United States, and rather more in British America, where they extend from Mouse River to the Athabasca. Methodists and Roman Catholics have missions among them.

ASSINIBOINE, a river of British North America, rising in lat. 51° 40′ N., and long. 105° E. At Winnipeg it joins the Red River, which discharges its waters into Lake Winnipeg. Its course measures about 400 miles.

ASSIUT, ASSIOOT, ASYOOT, ASYUT OR OSYUT, an ancient city of Upper Egypt. See EGYPT, Vol. VII, p. 775.

ASSOCIATED PRESS, an organization of newspaper owners for the purpose of collecting and distributing news. In 1849 the newspaper men of New York—the owners of the *Tribune*, *Herald*, *World*, *Times*, *Sun*, *Journal of Commerce* and *Express*—organized the New York Associated Press for the more systematic gathering of news. This association was not incorporated, but was a close company, in which it was impossible to obtain a membership. It sold its news to outside papers, in this way doing away with all expenses to its members. In 1865 there was formed the Western Associated Press, established under the laws of Michigan, with headquarters at Cleveland, Ohio. This association bought its news from the New York association. There were also, about that time, the New England Associated Press, New York City Press, Philadelphia Associated Press, Northwestern Association, and Southern Associated Press.

All the smaller associations bought their news from the New York Associated Press, being looked upon as, to a certain extent, members of it. In a short time, however, the Western members rebelled, claiming that while they had no voice in the management, they sustained the whole expense,—the old cry of "taxation without representation." Gradually the smaller associations were absorbed, until there remained, besides the New York Associated Press, only the Western Associated Press. In 1882 an

arrangement was effected that brought the New York Press Association and the Western association together under one management, which consisted of a committee of the proprietors of three New York and two Western papers. The general agent of the western association was appointed general manager. This agreement lasted ten years. The combination was known as the "Associated Press." In 1892 the western association obtained a charter under the laws of Illinois as "The Associated Press," while the New York Press Association disappeared, having fallen under the control of another press agency, called "The United Press." A working arrangement was entered into between the two associations, the same as before, with the advantage in favor of the Associated Press. This arrangement continued from December, 1892, until August, 1893; but at the latter date all relations ceased, and the two associations have since antagonized each other at every point.

The Associated Press has a membership of 280 affiliated members and 150 stockholders; 1,700 newspapers are served from the Atlantic to the Pacific; 20,000 miles of telegraph wire are leased. The expense of the service is $100,000 for each month. The Associated Press system in the United States is divided into four districts: the Eastern, with headquarters at New York; the Southern, headquarters at Washington; the Central, headquarters at Chicago, and the Western, with headquarters at San Francisco. Within these divisions are many subagencies. The European headquarters is at London, with correspondents in every city in Europe. The admission of members is controlled by local boards in cities having more than one member. The unanimous consent of the board is necessary before a new member can be admitted. When there is only one member, that member exercises the privilege of admission or refusal. See NEWSPAPERS, in these Supplements.

ASSOCIATE PRESBYTERY, an organization of persons who seceded from the Church of Scotland in 1733. In the United States the majority united, in 1858, with the Associate Reformed Church in forming the United Presbyterian Church. A small portion retained the name. There are to-day four presbyteries, all in America, consisting of 14 ministers, 33 congregations, and 1,200 communicants. See PRESBYTERIANISM, Vol. XIX, p. 685; UNITED PRESBYTERIAN CHURCH, Vol. XXIII, p. 728.

ASSOCIATE REFORMED PRESBYTERIAN CHURCH, organized in 1782, by the union of the Associate Presbyterians of Pennsylvania and New York with the Reformed Presbyterians of America. This union was broken in 1800. In 1802 the Associate Reformed General Synod was organized, with synods in New York, Pennsylvania and the Carolinas. In 1821 the Synod of the Carolinas became a separate body, still existing as the Associate Reformed Synod of the South. Several synods of the Northern body united in 1858 with the United Presbyterian Church. The New York Synod, however, remained independent, but in late years congregation after congregation has gone into the United Presbyterian Church, until to-day there are but two congregations, including 7 ministers and 350 communicants. See UNITED PRESBYTERIAN CHURCH, Vol. XXIII, p. 726; PRESBYTERIANISM, Vol. XIX. p. 685.

ASSOLANT, JEAN BAPTISTE ALFRED, French journalist and novelist; born at Aubusson, in 1827; died in Paris in 1886. He visited the United States in 1852, and upon his return in 1859 wrote a series of sketches as *Scènes de la Vie des États-Unis*, in connection with which he shortly after brought a charge of plagiarism against Victorien Sardou, maintaining that Sardou made use of his work in the play *Uncle Sam*. Sardou was acquitted of the charge. He followed his first sketches by a long series of novels, including *Brancas* (1859); *Marcomir; Gabrielle de Chenevert; François Buchamor; Pendragon* (1881). He was equally notable as a sarcastic and powerful journalist and political writer, being a regular contributor to the *Revue des Deux Mondes*.

ASSONANCE, resemblance in sound. In prosody it is the correspondence of sound produced by a reiteration of the same accented vowel with different consonants. It is a kind of imperfect rhyme, or rather a substitute for rhyme, and is especially common in Spanish poetry. All the old French poetry, also, was marked by assonance, not rhyme, and it frequently occurs in modern English poetry.

ASSOS, OR ASSUS, a ruined town of Asia Minor. See TROAD, Vol. XXII, pp. 579, 580.

ASSOUAN, ASWAN, ESSUAN OR ESWAN, the ancient Syene, on the Nile, near the borders of Nubia, 110 miles S. of Thebes, in lat. 24° 5′ 30″ N., and long. 32° 55′ E. Some traffic is carried on in senna, henna, charcoal, wicker baskets and slaves. The ancient name *Syene* is the Coptic word *souan* or *suan*, signifying "opening," and the modern one is formed by adding the Arabic *el*, "the," softened into *es*; namely, *Es-suan*, "the opening." Assouan and its vicinity are highly interesting to geologists and mineralogists. That kind of granite called syenite receives its name from this town. See EGYPT, Vol. VII, p. 783.

ASSUMPSIT (Lat. *assumere*, to assume or undertake; *assumpsit*, he has undertaken). In contracts it means an undertaking to perform an agreement not under seal, which undertaking may be either express or implied, called express assumpsit or implied assumpsit. In law, assumpsit has reference to a form of action in general use to recover damages for the breach of a simple contract. This is the common form of action for the recovery of money on a note or ordinary indebtedness. See TORT, Vol. XXIII, p. 454.

ASSUMPTION, a village on the western border of Christian County, central Illinois, on the Illinois Central railroad, 23 miles S.W. of Decatur, in an agricultural district. Extensive coal-mines are located there. Population 1890, 1,076.

ASSUMPTION (OR ASCENSION) OF MOSES. See APOCALYPTIC LITERATURE Vol. II, p. 177.

ASSYNT, a mountainous, moorish and very rugged district or parish, 25 miles long and 15 broad, in southwest Sutherlandsire, Scotland. It mostly consists of a network of rocky heights, interspersed with a multitude of dark, motionless tarns or pools,

of various sizes, with some larger lochs, the largest, Loch Assynt, being 10 miles long and 1 broad. See SUTHERLAND, Vol. XXII, p. 726.

ASSYRIAN ART. See BABYLONIA, Vol. III, p. 189.

ASSYRIAN LANGUAGE. See BABYLONIA, Vol. III, p. 192; SEMITIC LANGUAGES, Vol. XXI, p. 650.

ASSYRIAN LITERATURE. See BABYLONIA, Vol. III, pp. 191, 192; INSCRIPTIONS, Vol. XIII, p. 115.

ASTACUS, one of the fresh-water cray-fishes, abundant in Europe. It has long been one of the favorite objects for zoölogical study. The common American cray-fishes belong to the genus *Cambarus*. The genus *Astacus* occurs only west of the Rocky Mountains.

ASTARTE, a genus of bivalve mollusks found in northern seas. In geologic times the genus was very widespread and numerous in species.

ASTATIC, having no tendency toward any change of position,—"without polarity," used most frequently of a magnetic needle so arranged as to be unaffected by the earth's magnetism. This is managed by taking two magnetic needles, as nearly of the same intensity as possible, and placing them parallel to one another, with their poles in opposite directions. They thus neutralize each other, so as to be unaffected by the earth's magnetism, though they remain subject to galvanic action. This compound astatic needle forms the principal part of the astatic galvanometer.

ASTER, ERNST LUDWIG VON, Prussian general and military engineer; born at Dresden Oct. 5, 1778; died at Berlin, Feb. 10, 1855; served with the Russian, Saxon, and Prussian armies; planned the fortifications of Coblenz and Ehrenbreitstein. In 1842 he was appointed general of infantry and inspector-general of fortresses for Prussia. From 1856 to 1861 his *Nachgelassene Schriften* (5 vols.) were published.

ASTERACANTHION, a genus of star-fishes. The name *Asterias* is synonymous, and is used by recent authors.

ASTERIA, a gem. See SAPPHIRE, Vol. XXI, p. 302.

ASTERIDEA, the star-fish. See ECHINODERMATA, Vol. VII, pp. 632–634.

ASTEROIDS. For an account of the recent employment of the minor planets in the geometrical method of determining the solar parallax, see PARALLAX, Vol. XVIII, pp. 249–251. In Vol. II, pp. 807, 808, is given the list of then known asteroids, amounting to a total of 143, which has been continuously added to, until they now number over 400, this large increase being in great part due to photography. These bodies are now preferably known as "planetoids," and are all situated in the solar system between Mars and Jupiter. Till the nineteenth century they remained undiscovered, but for some years before their existence had been suspected, mainly owing to the remarkable hiatus in the series of the planetary distances when compared with the law of Bode. On January 1, 1801, the first of them (Ceres) was detected by Piazzi of Palermo, and his success aroused his brother astronomers to search for more planets. Their search was successful, for Olbers discovered two (Pallas and Vesta) in 1802 and 1807, and Harding one (Juno) in 1804, but as all researches for some time subsequent to 1807 were unavailing, astronomers gradually allowed themselves to settle down into the belief that no more planetoids remained to be discovered. But the detection of a fifth (Astræ) by Encke, in 1845, revived the hope of fresh discoveries, and from this period no year (excepting 1846) has passed without adding to the list. The number known at the beginning of 1851 was 13, of 1861 was 62, of 1871 was 112, of 1881 was 219, of 1894 was 390. This remarkable success of the astronomers of our time is due to the systematic manner in which the zodiacal belt has been explored, and the place and apparent size of every star of this region distinctly determined, so that the presence of a wandering body can at once be detected. Among the most successful of the discoverers of planetoids have been Palisa of Vienna, and C. H. F. Peters (1813–90) of Hamilton College, United States. The former, since 1872, has discovered more than 70, on one occasion as many as five in a week, while the latter, after 1861, discovered 48. The magnitudes of all of these celestial bodies have not been accurately ascertained, but Professor Barnard of Lick Observatory, by the aid of the great Lick refractor, has succeeded in measuring the diameter of the small planets Ceres (599 miles), Pallas (273) and Vesta (237). The most of them, however, are much smaller than this. They also differ, generally speaking, from the rest of the planets in other respects; their orbits are of greater eccentricity, are inclined to the ecliptic at a greater angle, and are interlaced in a most intricate manner, crossing each other so frequently as to form, when viewed perpendicularly, a kind of network. The consequence of this is that a planetoid which is nearest the sun at one part of its orbit is, when at another part of its orbit, farther from it than are several of the others, and a mutual eclipsing of the sun at different periods by two planetoids must be of very frequent occurrence. The mean orbit of the first 251 planetoids coincides, however, within 30′ with that of Jupiter. Of the planetoids of which the elements had, by 1891, been satisfactorily calculated, Medusa (No. 149) has the shortest period of revolution, 1137.69 days, and Hilda (No. 153) the longest, 2869.92 days. The corresponding mean distances from the sun, expressed in parts of the earth's mean distance, are, respectively, 2.13275 and 3.95228. Till 1876 the extremes known in this respect were Flora and Sylvia, respectively. The nearest approach to the sun is made by Phocea (perihelion distance, 1.787). Freia recedes farthest from him (aphelion distance, 4.002). Polyhymnia's orbit has the greatest eccentricity, amounting to .33998; Lomia's the least, .2176. Massalia's orbit makes a smaller angle—only 41′ 7″—with the ecliptic than that of any other planet in the solar system, while the inclination of the orbit of Pallas is no less than 34° 42′ 41″. After the first two or three of these bodies had been discovered, the opinion was propounded by Olbers that they were but the fragments of some large planet, and this hypothesis received corroboration from the intimate

connection which was shown to subsist among them; but of late years it has fallen out of favor with astronomers. Some infer that the planetoids are best accounted for by the nebular hypothesis. It has been calculated that the combined mass of all the planetoids cannot exceed one fourth of the earth's mass.

ASTEROLEPIS, a gigantic fish found as a fossil in the old red sandstone of Europe. Its length is estimated at from 16 to 20 feet.

ASTEROPHYLLITES (Gr. *aster*, a star; *phyllon*, a leaf), a generic name under which are included many of the most abundant fossil plants of the coal-measures; the leaves are arranged in a stellated manner around the stems or branches.

ASTIÉ, JEAN FRÉDÉRIC, French Protestant clergyman; historical, theological and philosophical writer; born Sept. 21, 1822, at Nerac; from 1848 to 1851 was the pastor of a French-Swiss church in New York; since 1852 has held a professorship at Lausanne. He wrote many works on history and philosophy, among them *Histoire de la Républiique des États-Unis, 1620–1860* (1865); *Théologie Allemande Contemporaine* (1874); *La Crise Théologique et Ecclésiastique* (1881); *Réalité, Franchise et Courage.*

ASTIGMATISM (Gr. *a*, "not"; *stigma*, "a point"), a defective condition of the eye. See EYE, Vol. VIII, p. 819; OPHTHALMOLOGY, Vol. XVII, p. 785.

ASTLEY, PHILIP, English equestrian and theatrical manager; born at Newcastle-under-Lyme in 1742; died in 1814; served in the Seven Years' War; left the army in 1765; in 1870 started an exhibition of horsemanship near London, and afterward established a circus at Paris. He published, among his writings, *The Modern Riding-Master* (1775), and a *System of Equestrian Education* (1801).

ASTOLPHUS, ASTULPHUS OR AISTULF, king of the Lombards from A.D. 749 or 750 to 756; seized Ravenna and the Pentapolis in 752; then threatened Rome, but was defeated in 754 by Pepin, king of the Franks, who entered the war at the earnest solicitation of the pope. Pepin obliged Aistulf to surrender Ravenna and the Pentapolis, which were at once ceded to the pope, whose temporal supremacy may be said to have dated from this period. See LOMBARDS, Vol. XIV, p. 815.

ASTOR, JOHN JACOB, American capitalist; born in New York in 1823; died there Feb. 22, 1890; received his academic education at Columbia College; passed some years in Europe; inherited, in 1875, a vast fortune from his father, William B. Astor. Although known to the public almost exclusively as a man of vast wealth, he was not a mere money-getter. His charities, though unostentatious, were large. He gave to the Astor Library, founded by his grandfather, not only over $450,000 in money and land, but much personal supervision, and contributed year by year unknown thousands to a great variety of objects.

ASTOR, WILLIAM BACKHOUSE, capitalist; born in New York City, Sept. 19, 1792; died there Nov. 24, 1875. In 1815 he went into partnership with his father, John Jacob Astor, who was engaged in the China trade. In 1827 the Astors retired from the China trade, and the American Fur Company was formed, with William B. Astor at the head. The business prospered, but finally the Astors grew tired of commerce, and they both withdrew. At his father's death William was left sole heir to the Astor fortune. For about 13 years prior to 1873 he was engaged in building, until much of his hitherto unoccupied land was covered with houses. In 1867 he owned 720 houses, was heavily interested in railroad, coal and insurance companies, and at the time of his death was worth about $45,000,000, which was divided between his two sons, John Jacob and William Astor. He gave, in money, land and buildings, about $550,000 to the Astor Library.

ASTOR, WILLIAM WALDORF, capitalist and publisher; born in New York, March 13, 1848; graduated at Columbia College in 1875; was United States minister to Italy from 1882 to 1885. In 1891 he went to England, taking up his residence in London. He caused much comment in 1894 by becoming a naturalized British subject. In October, 1892, he purchased the *Pall Mall Gazette* and the *Budget*. He started the *Pall Mall Magazine* in 1893. He is the author of two Italian romances, *Valentino* and *Sforza*. He is one of the wealthiest men in the world, inheriting a fortune of $150,000,000.



WILLIAM WALDORF ASTOR.

ASTORIA, a town of Fulton County, western central Illinois, on the Chicago, Burlington and Quincy railroad, 50 miles N.W. of Springfield. Population 1880, 1,280; 1890, 1,357. It is in the midst of rich coal-fields, and considerable mining is done.

ASTORIA, a city and port of entry, and capital of Clatsop County, northwest Oregon, at the mouth of the Columbia River, 70 miles N. of Portland; founded in 1811 by John Jacob Astor and named after him; the chief salmon-packing point in the Northwest, 24 of the 38 canneries along the Columbia River being located here. The lumbering industry is also very important. Population 1880, 2,803; 1890, 6,184. See ASTOR, Vol. II, p. 737.

ASTOR LIBRARY, a library in New York City, founded in 1848 by John Jacob Astor, who left a legacy of $400,000 for that purpose. The library was first opened to the public in 1854. Two years later William B. Astor gave land on which he erected a second structure. A third addition was built, giving the entire structure a length of 200 feet, a width of 105 feet, and a height of 70 feet. In addition to the lot and building William B. Astor gave the library $200,000. His son, John Jacob Astor, in turn gave $450,000. The library now includes over 235,000 volumes, and has an income of $23,000. It is free to the public. See TILDEN LIBRARY in these Supplements.

ASTRÆA, the goddess of justice, the last of all the goddesses who left the earth when the golden age had passed away, and men began to forge weapons

and perpetrate acts of violence. She was placed in the heavens by Zeus as one of the signs of the zodiac, and is now known as Virgo.

ASTRÆIDÆ, an important family of stone-corals (*Madreporaria*). They are often known as star-corals. In the formation of reefs the corals of this family are important agents.

ASTRAGALUS, a bone of the foot, which, by a convex upper surface and smooth sides, forms, with the leg-bones, the hinge of the ankle-joint. Its lower surface is concave and rests on the *os calcis*, or heel-bone, to which it is attached by a strong ligament. In front it has a round head, which rests in the concavity of the scaphoid, another bone of the tarsus, and upon an elastic ligament, its pressure upon which gives, in a great measure, the necessary elasticity to the foot; it is at this joint that inversion and eversion of the foot take place.

ASTRAGALUS, a papilionaceous plant. See HORTICULTURE, Vol. XII, p. 250.

ASTRALITE, a kind of glass; made, in part, of copper crystals; possesses that iridescent appearance which shows a different color when viewed in different directions; resembles very closely aventurin. It is made by a fusion, followed by a slow cooling, of a mixture of 120 parts of litharge, 72 of carbonate of soda, 80 of silica, 24 of scale oxid of copper, 18 of borax glass, and one of scale oxid of iron. See GLASS, Vol. X, p. 660.

ASTRAL SPIRITS, the spirits which, according to the belief of some theosophists, guard every object, but especially human beings. Each astral spirit possesses a series of astral bodies, which are perishable in time, each one in the series being occupied as its predecessor is left. These astral bodies are the connecting links between the material and the spiritual. The astral spirit guards the material body until the death of that body, when the spirit moves to some newborn body and lives another life, gaining by experience and retaining a remembrance of its past doings. According to the mythology of the Greeks and Persians the astral spirits occupied the stars, originating from fire and dead men's souls. Each star in turn was supposed to have a special spirit, forming, as it were, its soul.

ASTRINGENTS, substances having the power of contracting tissues, as any kind of acid; employed in medicine for contracting the tissues and canals so as to check fluxes, hæmorrhages and diarrhœa. Tannic and gallic acid, oak-bark blackberry root and catechu are among the best vegetable astringents; alum, iron, sulphuric, nitric, and hydrochloric acids, among the minerals. See TANNIN, Vol. XXIII, p. 47; GALLIC ACID, Vol. X, p. 41; IRON, Vol. XIII, p. 360.

ASTROCARYUM, a genus of palms, of which about 16 species are known, natives of tropical America; remarkable for the abundance of acute and formidable spines, in some cases a foot long, with which almost every part, stem, leaves, spathe and fruit-stalk, is armed. They have beautiful pinnate leaves, and are used by the natives for a variety of purposes. The wood of *A. Ayri* is used for bows, and the leaf-fibers of *A. Tucuma* for fishing-nets.

ASTROLABE (derived from two Greek words which mean to take a star), an instrument anciently used by the Greeks for taking the altitude of the stars. See NAVIGATION, Vol. XVII, pp. 251, 252.

ASTRONOMICAL PHOTOGRAPHY. See PHOTOGRAPHY, ASTRONOMICAL, in these Supplements.

*ASTRONOMY. The following is a brief statement of the most salient points in astronomical research and discovery since the publication of Mr. Proctor's article, in Vol. II, pp. 744–823, of this ENCYCLOPÆDIA. That extensive and important branch of the science which consists in the more exact discovery of numbers, distances, masses, etc., may be lightly passed over, in order to devote attention more especially to new discoveries of facts or laws.

The 20 years in question are remarkable for the addition of three new satellites to the 18 previously known. Perhaps no discovery during the nineteenth century, except that of the planet Neptune, excited more surprise and interest, both among astronomers and the public, than that of the satellites of Mars, by Professor Hall, in August, 1877. These satellites are remarkable for two features, their extreme smallness, and the short period of the inner one. Although Mars is so much nearer the earth than any other planet having a satellite, its satellites are among the difficult objects, only to be seen with telescopes of considerable size. Their diameter is probably between 5 and 10 miles, so that they are the smallest bodies of the solar system, some of the asteroids excepted. The inner one makes its revolution in the remarkably short period of 7h. 39m. 14s.,—less than one third that of the rotation of the planet on its axis. This is a new and remarkable circumstance, of which the consequence is, that to an observer on Mars the satellite rises in the west and sets in the east.

In September, 1892, a new satellite of Jupiter was discovered by Barnard with the great telescope of the Lick Observatory. It is much nearer to Jupiter than the four satellites already known, and makes a revolution in 11 h. 57 m. 23 s. It can be seen only with a very few of the most powerful telescopes of the world, owing not only to its minuteness, but to its closeness to the planet, in whose rays it is lost to ordinary telescopic vision.

The number of small planets known to circulate between Mars and Jupiter has increased to more than four hundred. The rapid increase of the past four years in the rate of discovery is due to the application of the art of photography. In this work the lead has been taken by Charlois of Nice and Wolf of Heidelberg. To carry on the search a sensitive plate is exposed in the focus of a telescope having a short focal length (even a large camera might suffice), so constructed as to have a field of view several degrees in extent. After an exposure of one or two hours, innumerable small stars will be photographed on the plate. If a small planet is within the region photographed, it may be detected either by its image being a line instead of a point, or by comparing two plates taken at a short interval. The principle on which the discovery rests is, that while the stars remain perfectly at rest, the



*Copyright, 1896, by The Werner Company.

asteroids are in motion. The number of asteroids already known which are rediscovered in this way much exceeds the number of new ones. We conclude, therefore, that the new ones yet to be discovered are extremely small, and it may be expected that before many years a limit will be reached beyond which it is not worth while to seek for more. Even now it is not possible for astronomers to keep an accurate run of the motions of the four hundred known ones.

Great popular interest has been felt in certain features of the planets, notably Mars. We may mention, in this connection, the work of Mr. Percival Lowell's private observatory, founded at Flagstaff, Arizona, for the express purpose of observing Mars during the opposition of 1894. The planet was never before studied under conditions more favorable. The focus of interest has been the so-called canals, discovered by Schiaparelli. The term is, however, a misnomer, because these lines, to be visible at the distance of the earth, must be at least from 50 to 100 miles broad. They are said to consist of a network of fine, dark lines, passing from point to point on the planet, with dark spots at the points of meeting. It must be said that, owing to the extreme difficulty of detecting these canals, there is still some difference of opinion as to their exact nature. Quite possibly, under more perfect atmospheric conditions than astronomers have hitherto availed themselves of, the details would appear entirely different; indeed, the latest paper by Barnard indicates that with the finest seeing ever available at Mount Hamilton, and the great advantages of the 36-inch telescope, the surface of Mars appears entirely different from the drawings of Schiaparelli and others. What the latter describe as fine lines he then saw as irregular, hazy streaks.

The question whether Mars has an atmosphere sufficiently dense to make its presence evident by the most delicate observations, is still an unsettled one. Both Huyghens and Janssen thought they had found evidences of aqueous vapor in the atmosphere of Mars. This evidence was afforded by those lines in the spectrum due to such vapor being better marked than they would have been were the light reflected from the planet itself. But Campbell, at the Lick Observatory, made a series of investigations with the spectroscope, under conditions more favorable than those enjoyed by any previous observer, owing to the height of his station and the serenity of the air. His observations were made by comparing the spectrum of Mars and of the moon, when the latter was in the immediate neighborhood of the planet. The moon is well known to have no visible atmosphere. If, then, Mars has an atmosphere sufficiently dense to make the spectral lines much stronger, or has sufficient watery vapor to produce that effect, there ought to be a difference between the spectrum of Mars and that of the moon. Mr. Campbell could find none. It does not follow from this that Mars has no atmosphere, but only that the atmosphere, if it does exist, is probably much rarer than that on the earth, and perhaps is without aqueous vapor.

A very careful study of the appearance of Venus, with a view to fixing its time of rotation, and ascertaining the nature of its surface, has been made in Italy by Schiaparelli, and in southern France by Perrotin. For two centuries it has been supposed by some that Venus rotated on its axis in a period not differing much from 24 hours. At the same time the more cautious astronomers have always maintained that the time of rotation was altogether unknown, because the spots on Venus, if they existed at all, were so indistinct that no one could trace them out, and follow their motion from night to night, with entire certainty. It was therefore not so surprising as it might have been, when Schiaparelli announced that Venus, like our moon, rotated on its axis in the same time that it revolves around the sun, and therefore always presented the same face to the sun. Quite recently, Perrotin has studied the planet from the summit of Mount Mounier, in southern France, with a view of testing Schiaparelli's conclusions, and has convinced himself of their correctness. But it is quite likely that most astronomers will still be somewhat skeptical. The fact is, that Venus, when seen through a telescope of high power, even the best, presents a glaring aspect, somewhat like that of burnished metal shining by the light of a strong fire, which prevents the observer from making out anything in the shape of fine details. It is true that different parts of the surface present very different degrees of brightness, according to the way the light is falling upon them, and appearances somewhat like bright spots are seen near the upper or lower limb. But it is still open to question whether there is anything to be outlined with such distinctness that an observer can positively identify spots or other markings on the planet.

The question as to the form and constitution of the satellites of Jupiter has given rise to much discussion. Barnard, while observing the transit of the first satellite over the disk of the planet, was surprised to see it look double. After long and careful discussion of this appearance, he concluded that the apparent duplicity was an illusion, produced by a dark belt across the body of the satellite. Prof. W. H. Pickering, who observed the satellites under exceptionally fine conditions at Arequipa, Peru, found them to exhibit irregular and anomalous forms at various times, showing a very great ellipticity of figure.

Interesting results continue to be obtained with the spectroscope. Among these we must give a high place to the very delicate determinations of the revolution of the rings of Saturn made by Keeler at Albany. These rings were long a marvel to astronomers, because it was clearly impossible that solid bodies of this kind could be maintained in equilibrium around the planet, or could even hold themselves together under the attraction of that body. It was therefore long ago surmised that they could be nothing but clouds of minute satellites or particles, which at so great a distance presented the appearance of a continuous mass of matter. But no proof of this had ever been obtained, except that it was impossible to see how it could be anything else. Keeler, by spectroscopic observation, was able to show that the inner portion of the rings actually

revolved around the planet at a more rapid rate than the outer portion. This observation was soon confirmed by other observers. It shows that the view that the rings are a cloud of satellites or particles, originally propounded by Cassini more than 200 years ago, and more recently developed by Maxwell and others, is the true one.

COMETS. Although few comets of great brilliancy have been discovered during the twenty years in question, the patience of careful observers who are continually sweeping the sky with comet-seekers to detect any new visitor of this class, is frequently rewarded by success. Many of these bodies revolve in orbits which are apparently parabolic, so that they will not again return for many centuries. But an unusually large number of periodic comets have recently been discovered. It is now fairly well settled that these bodies become periodic through the accident of having at some time passed very near a large planet, nearly always Jupiter, which by its attraction so changes their parabolic orbits as to make them elliptic. In this case the comet becomes a permanent member of the system, until it again happens to pass very near Jupiter, when its orbit may be again changed. Continued observations have confirmed the view that a comet thus brought into the system is short-lived, if we measure life by a celestial standard. It gradually grows fainter as it goes through its successive revolutions, and a considerable number have entirely disappeared. The tenuous masses of which they are composed are gradually scattered so as to be no longer visible. Their fate is much like that of a cloud of tobacco-smoke in the air. If the orbit happens to intersect that of the earth, then, at every passage of the earth through it, we may have a meteoric shower, caused by the atmosphere striking the invisible remains of the comet which are scattered around its orbit. Such showers occur in October and August, and sometimes in November.

DISTANCE OF THE SUN. Among the most interesting astronomical events of the period in question were the two transits of Venus, which occurred on Dec. 7–8, 1874, and Dec. 5, 1882. The first was not visible either in western Europe or on the American continent. The region of visibility included most of the Pacific Ocean, Asia, Australia and the neighboring islands. Very elaborate and costly expeditions were organized by the leading countries of the world, especially the United States, Great Britain, France and Germany, to make the necessary observations. As the phenomenon had to be observed in opposite hemispheres, the authorities of the United States selected stations on Kerguelen Island, Tasmania, New Zealand, and Chatham Island, in the southern hemisphere; and at Vladivostock, Nagasaki and Pekin, in the northern hemisphere. In the general average, the American expeditions were unfortunate as regarded weather. At every station the observations were seriously interfered with, either by clouds, or by haze and dust. So far as the exact determination of the solar parallax is concerned, the results scarcely corresponded to the popular expectation. It was found that the observation of the moments of contact of the limb of Venus with that of the sun, on which the result had generally been made to depend, could not be made with the accuracy that had been anticipated. The best observers frequently differed by a considerable fraction of a minute in their estimates. Other methods were, however, more successful. The measures of the distance between the center of the sun and that of Venus, made by the Germans with heliometers, and by Americans with photographic apparatus, appear to have been fairly reliable. But the fact is, that other methods of determining the solar parallax have been developed, so that less reliance is now placed on the observations in question.

These drawbacks did not prevent very elaborate preparations for the transit of 1882, which had the great advantage of being visible over the entire American continent, where the former one was quite invisible. It was supposed that with the aid of the experience derived in 1874 the methods of observation could be greatly improved. This was the case with the American photographic methods, but was not the case with the telescopic methods used by observers generally.

The most recent researches show that the problem of the exact value of the solar parallax, notwithstanding the progress that has been made, the elaboration of new methods, and the thorough discussion of old ones, is still in an unsatisfactory state. From the German heliometer measures made on the transits of Venus in 1874 and 1882, as just mentioned, Dr. Auwers has found a parallax of 8.88″. In 1889, on the proposal of Gill, several observatories in both hemispheres engaged in a campaign to determine the solar parallax by heliometer observations on those asteroids which came near the earth during the times of opposition. The result was 8.80″. This seemed to be confirmed by a number of other methods, which agreed remarkably with it. Up to the beginning of 1895 little doubt was felt among astronomers who paid attention to the subject that this figure was extremely near the truth. Then it was found that the observed motion of the orbit of Venus and of the ecliptic could not be reconciled with this value; indeed, that the only value which would bring everything into accordance was 8.76″. Whereabouts, between the limit 8.76″ and 8.80″, the truth may lie must be left to future investigation. Translated into miles, we may say that the mean distance of the earth from the sun lies between 92,900,000 and 93,300,000. miles.

The mysterious motion of the perihelion of Mercury, which is greater than that which calculation shows to be produced by the action of all the planets, is not yet satisfactorily explained. Heretofore, it has generally been attributed to the attraction of some unknown bodies near the sun. But the perihelion of Mars is found to be probably affected with a similar motion, though smaller in amount. The latest suggestion on this subject is, that the law of gravitation may not vary exactly as the inverse square. A very slight deviation from this law would account for the observed anomalies. But many years of accurate observation, and a large amount

of profound mathematical investigation, are requisite before further light can be thrown on this question.

On the physical constitution of the sun it can hardly be said that much new light has been thrown, though many facts have been collected. Observations of the solar corona are still made at every available total eclipse; the protuberances are from time to time observed with the spectroscope, and the spots on the sun are observed or photographed at several great observatories. All this work confirms what was previously known, especially that the spottedness of the sun goes through a regular period of 11 years, during a part of which time the spots are large and numerous, while during the remainder of the period few or none may be visible. Quite recently, however, interesting researches have been made on the light of the sun which belong to chemistry and physics as much as to astronomy. Among these may be mentioned the discovery of a new element which has long been known to exist in the sun, being shown by a line in the spectrum, but was sought in vain on the earth. In 1895 this element was discovered on the earth, in a rare mineral, clevite, found in Norway. Curiously enough, this discovery was almost coincident with that of argon, the new element of the atmosphere, by Rayleigh and Ramsay. Among the great advances in the study of the sun's light must be named the photographic spectrum of the sun now being completed by Rowland, including his measures of a great number of spectral lines, and the investigation of the spectrum of the heat-rays made by Langley at the Astrophysical Observatory in Washington. These researches may, in the future, be expected to throw more light on the question of the relation of climate to the heat of the sun.

Passing outside the solar system to the region of the stars, we find a number of investigations of the motion of the solar system toward some point in, or not far from, the constellation Hercules. Owing to the motion of the stars themselves, however, there is not yet an exact agreement as to the amount or direction of this motion. In a general way we may say that if the spectator looks up to the heavens a little south of the zenith, on a summer evening, he may correctly imagine our earth and everything upon it as moving toward the constellations he there sees, with a speed of several miles per second. The motion has been going on since the creation, and will probably continue for unknown ages in the future.

The number of stars known to be variable has increased from 100 to more than 250. For the most part, it seems that the variability is due to a cycle of changes going on within the star itself, similar, perhaps, to those of spots on the sun. But in the case of Algol, a star long known to be variable, it is now almost certain that the changes consist in a partial eclipse of the star, produced by the revolution of a dark body, having nearly the same size as the star itself, revolving around it. The period of revolution is, of course, that between the partial eclipses, about 2 days 21 hours. Other indications of dark bodies moving around stars and disturbing their motion have been brought to light. Among the most interesting is that of Procyon, a star of the first magnitude, which is affected by a periodic motion, showing that an invisible satellite is moving around it in a period of 20 years. But the most careful search with the great telescopes of the world, even that of the Lick Observatory, have failed to reveal the object. Chandler has found evidences of a similar revolution in the case of Algol, to which he attributes a change which has been noticed in the apparent period of the star. It is not, however, considered that this motion is yet fully established.

The general outcome of these and other discoveries of the same kind is, that many of the stars are probably accompanied by planets almost as large as themselves, and therefore very different from those of our system. A most powerful instrument for these discoveries is the spectroscope, by which the motions of the star to or from the earth are discerned. It is very remarkable that a motion of this sort, entirely invisible to the eye, can be thus detected, when it would be wholly incapable of detection if it took place across the line of sight, when the great distance of the star might make it insensible to our means of measurement.

The most accurate measures made on the parallax of stars by the aid of the heliometer have failed to show any star nearer than the nearest already known, $\delta$ Centauri. The parallax of this body is now very exactly fixed at .75″, corresponding to a distance of 270,000 times that of the earth from the sun. Through this space light itself, which would circle the earth eight times in a single second, requires more than four years to pass. It is very remarkable that no other stars, even of the first magnitude, are found to be so near as this. Most of those which have been measured have distances from five to ten times as great. Beyond the latter limit, the distance becomes unfathomable by any known method.

Among the new stars which have been found, the most noteworthy was that of 1892, which has since been called Nova Aurigæ, after the constellation in which it appeared. As in the case of other stars suddenly blazing out, the spectrum was found to be an extremely complicated one. It showed apparent displacements of the bright or dark lines, indicating rapid motion to or from the earth. But the spectrum changed in a manner which was very bewildering to one who attempted to construct any certain and well-defined theory of the nature of the star. That there was an explosion or outburst of some sort seems beyond doubt. Whether this arose from a dark body striking the star, or from a process going on inside of the star itself, science cannot decide. We have already cited the evidence of numerous dark bodies moving around or in the neighborhood of stars, and it is not at all impossible that such a body might at last fall into its central sun. But it is equally true that there is no positive proof of this. All that can be said is, that the sudden blazing up of a star, previously very small, perhaps quite unknown, so that its brightness is increased scores, or even hundreds, of times, is not a very uncommon phenomenon in the heavens, but the cause is yet unknown.

SIMON NEWCOMB.

ASTYAGES, a Median king; according to Herodotus, was the successor of his father, Cyaxares, and was the grandfather of Cyrus the Great. He was dethroned by Cyrus about 560 B.C., and is called the last king of Media. See PERSIA, Vol. XVIII, p. 564.

ATACAMITE, an ore of copper, most abundant in the Desert of Atacama, whence its name; found as a crust on the lavas of Vesuvius and Ætna. See COPPER, Vol. VI, p. 347; MINERALOGY, Vol. XVI, p. 385.

ATAMASCO OR ATAMASCO LILY, a bulbous plant (*Zephyranthes Atamasco*), native in the southern part of the United States. The plant bears a single white, lily-like flower, and belongs to the *Amaryllidaceæ*.

ATAULF, a Visigothic king. See GOTHS, Vol. X, pp. 849, 850.

ATAVISM (Lat., *atāvus*, "ancestor") OR REVERSION, ancestral, but not parental, characteristics in an animal or plant. See BREEDS, Vol. IV, p. 247.

ATCHISON, a city, the capital of Atchison County, northeastern Kansas, on the Missouri River, 50 miles above Kansas City; a railroad and commercial center, being on the line of the Missouri Pacific, Atchison-Topeka and Santa Fé, Chicago, Rock Island and Pacific and Burlington and Missouri railroads; has extensive flouring-mills; a large wholesale trade and some manufactures; has three colleges, Midland, St. Benedict's, and St. Louis. Population in 1880, 15,105; 1895, 15,500.

ATCHISON, DAVID R., politician, and United States Senator from Missouri, was born at Frogstown, Kentucky, Aug. 11, 1807, and died Jan. 26, 1886. In 1830 he went to Missouri, and was twice, in 1834 and 1838, elected to the legislature; in 1841 he was appointed judge of the Platte County circuit court, and in 1843 was appointed United States Senator to succeed Lewis F. Linn, holding the position until 1855. He took a prominent part in the Kansas troubles of 1854–56, being an active partisan of the pro-slavery forces.

ATELES (Gr. "incomplete"), spider-monkeys. See APE, Vol. II, p. 153.

ATELIERS NATIONAUX OR NATIONAL WORKSHOPS, an institution promoted by Louis Blanc in France. See SOCIALISM, Vol. XXII, p. 209.

ATELLANÆ FABULÆ, a kind of popular drama in Rome. See ATELLA, Vol. II, p. 827.

A TEMPO, literally, a relative rate of movement; in music, used to indicate that the time changed at some previous point is to be restored.

A TEMPO GIUSTO, a musical term signifying that after a recitative the performer should keep true and correct the rhythm and time, which had been altered during the recitative.

ATESSA, a town in the province of Chieti, southeastern Italy, 24 miles S.E. of Chieti. It has a beautiful collegiate church and several convents. Population 1890, 9,786.

ATEUCHUS, sacred beetle of Egypt. See COLEOPTERA, Vol. VI, p. 131.

ATHABASCA, a territory. See NORTHWEST TERRITORIES, in these Supplements.

ATHABASCAN OR TINNEY INDIANS include the majority of the North American Indians of to-day. According to the census of 1890, there were at that time about 33,000 Athabascans. These were divided as follows: In Alaska and British Columbia, 8,600; in Washington, Oregon, and California, about 900, and in New Mexico, Arizona, Indian Territory, Oklahoma and Colorado, about 23,000. See INDIANS, Vol. XII, p. 827.

ATHANARIC, a chief of the western Goths, whose settlements lay on the north bank of the lower Danube, in the fourth century. See GOTHS, Vol. X, pp. 848, 849.

ATHANASIAN CREED. See CREEDS, Vol. VI, pp. 562, 564.

ATHEISM. See THEISM, Vol. XXIII, p. 234.

ATHELING, a title of honor among the Anglo-Saxons, which, at first applied to the descendants of the primitive nobles of the first settlement, gradually became confined to the princes of the blood royal, and in the ninth and tenth centuries exclusively to the sons and brothers of the reigning king.

ATHELNEY, ISLE OF, a marsh embracing about 100 acres in Somerset County, southwestern England; formerly an island at the junction of the Tone and Parret rivers. Here Alfred took refuge when the Danes invaded Wessex in 1878. Here he built, in 888, a Benedictine abbey, since destroyed.

ATHENAIS. See EUDOCIA, Vol. VIII, p. 659.

ATHENS, AMERICAN SCHOOL OF CLASSICAL STUDIES AT, a school projected by the Archæological Institute of America, organized under the auspices of American colleges and in charge of a committee appointed by the institute. It furnishes to graduates of American colleges an opportunity to study classic art and antiquities under suitable direction and in co-operation with the Archæological Institute. The director, who is chosen from among the professors of Greek language and literature in the associated colleges, resides at Athens and serves for one or two years. The first session began in 1882. The co-operating colleges in 1893 were: Amherst, Brown, College of the City of New York, College of New Jersey, Colorado, Cornell, Dartmouth, Harvard, Johns Hopkins, Trinity, University of the City of New York, University of Michigan, University of Missouri, University of Pennsylvania, Wesleyan University, Wellesley College and Yale University. The most important work accomplished has been the discovery and excavation of the Heræum of Argos, completed in 1895. The famous Temple and the art of the period of Agamemnon and Ulysses were here brought to light. The same year the Greek government granted a concession for the exclusive privilege of excavating on the site of ancient Corinth.

ATHENS, capital of Limestone County, northern Alabama, is 108 miles by rail S. of Nashville, Tennessee, and 27 miles N.W. of Huntsville. On Sept. 23, 1864, Colonel Campbell, commanding a regiment of United States colored troops, surrendered this town to a cavalry force under General Forrest. Early in October, however, the place was retaken and held by United States forces under Colonel Slade of the Seventy-third

Indiana. Here are located a Methodist college for young women and the State Agricultural School. Population 1880, 1,011; 1890, 940.

ATHENS, railroad center, and capital of Clark County, north-central Georgia, is on the Oconee River, and contains the State College of Agriculture, the Lucy Cobb Institute, and the University of Georgia. It is an important cotton market, about 30,000 bales being received annually. Population 1880, 6,099; 1890, 8,639. See also Vol. III, p. 11.

ATHENS, town in Greene County, southeastern New York, is on the west bank of the Hudson River, 27 miles by rail S. of Albany. The town of Hudson, across the river, is connected with it by a steam-ferry. Limestone is quarried here and burnt for lime. Population 1880, 2,106; 1890, 2,024.

ATHENS, railroad center, and capital of Athens County, southeastern Ohio, is 130 miles E. of Cincinnati and 22 miles W. of the Ohio River. The University of Ohio was established here in 1804, and here also is located the Southeastern Ohio Asylum for the Insane. Furniture and machinery are manufactured. Population 1880, 2,457; 1890, 2,620. See also, Vol. III, p. 11.

ATHENS, a town of Bradford County, northeastern Pennsylvania, is 3 miles S. of the New York state line, 22 miles by rail S.E. of Elmira, New York, and 2 miles above the junction of the Chemung and the Susquehanna rivers. Athens was formerly known as Tioga, and was the most important trading-post in the region. Furniture, iron-work for bridges and farm implements are manufactured. Population 1880, 1,592; 1890, 3,274.

ATHENS, capital of McMinn County, southeastern Tennessee, is 55 miles by rail S.W. of Knoxville. An academy, a seminary for girls and the Grant Memorial University are here. Population 1880, 1,100; 1890, 2,224.

ATHENS, capital of Henderson County, east-central Texas, is 68 miles S.E. of Dallas, with which it is connected by rail. It is situated in a cotton raising district, and there are manufactures of brick, tile and pottery. Population 1880, 368; 1890, 1,035.

ATHERINE, a genus of small fishes related to the mullets and belonging to the family *Atherinidæ*. They are found in America and Europe. The common silversides, with bright silvery band along the sides, and the sand-smelt are examples. See ICHTHYOLOGY, Vol. XII, p. 690.

ATHEROMA. See FATTY DEGENERATION, Vol. XVIII, p. 390.

ATHERSTONE, an old market town of Warwickshire, England, 14 miles N. of Coventry by rail. It has manufactures of hats, stockings, and ribbons, and is situated on Watling street, the old Roman road to the north. The birthplace of Drayton is near Atherstone. Population, 4,645.

ATHERTON, CHARLES GORDON, United States Senator, was born at Amherst, New Hampshire, July 4, 1804, and died at Manchester, New Hampshire, Nov. 15, 1853. He was graduated at Harvard in 1822, and became a member of the New Hampshire bar three years later. He sat in the state legislature from 1832 to 1837, and was a Democratic member of Congress from 1837 to 1843, and was the author of a rule that all petitions relating to slavery should be tabled without debate,—a rule known as "Atherton's Gag." From 1843 to 1849, and again in 1852, he was a Senator from New Hampshire.

ATHERTON, GERTRUDE FRANKLIN, an American authoress, born in California. She commenced at an early age to depict the Old-World calm of the missions of her native state. Her *Los Cerritos*, a story of Mexican-American life, was a success, from the fidelity of its portraiture. Her later works were *A Whirl Asunder; The Doomswoman; Patience Sparhawk and Her Times;* and a graphic study of old Mexican days, *Before the Gringo Came*. Mrs. Atherton became a permanent resident in London, England, shortly after the publication of her earliest work.

ATHERTON, JOSHUA, lawyer and politician, was born at Harvard, Massachusetts, June 20, 1737, and died at Amherst, New Hampshire, April 3, 1809. He was an alumnus of Harvard; was for a time a loyalist, but finally took the oath of allegiance to the United States, and in 1779 was admitted to practice in the New Hampshire courts. He was a member of the convention which adopted the Federal constitution, and was attorney-general of the state of his adoption in 1783.

ATHLETIC TRAINING AND APPARATUS. The last 25 years have witnessed a practical revolution, not only in the manner of training athletes for general or special work, but also in the apparatus provided for their use, changed theories of course bringing about changed methods of practice. The theory up to within quite recent times was, that the muscles were best trained by "heavy" exercises,—lifting great weights, swinging from rings, horizontal bars and trapezes, etc. The present theory, based upon the intelligent research of physicians and anatomists, who have made the development of the human body a scientific study, and the correctness of which has been proved by the results obtained in many thousands of measured cases, aims at the symmetrical development of the entire body by means of light, rapid movements, often repeated, graduated to the ascertained strength of the performer, with apparatus specially designed for the production of the result determined upon beforehand. Thus a student going into a gymnasium fitted up and conducted in accordance with scientific ideas is first carefully measured, and the strength of every muscle determined; the grip of the hands, e.g., by an instrument held in them, recording upon a scale actuated by a spring the amount of power exerted; the strength of the back by a direct pull on a lifting-machine, the handle of which passes between the legs as the body is bent; the capacity of the chest by blowing into a reservoir that measures in cubic inches the amount of air exhaled by the lungs. The results thus ob-

tained are compared with the average results from thousands of other persons, and the deficiency of any part at once indicated. If the test proves that the applicant is proportionately too weak in the chest, neck and arms, strong enough in the back and legs, and too large in the abdominal regions, he will be given the chest-weights (weights graduated from 1¼ pounds up to about 15, secured to ropes, and sliding over pulleys, from which about thirty different exercises may be obtained) and overhead weights to strengthen these muscles, and weights pulled upward from the floor, together with exercise on the stationary bicycle, to reduce the superfluous abdominal flesh. As the strength of the practitioner increases, the number of pounds on the chest-weights, overhead weights and floor-weights will be slowly increased, and such machines introduced as will cause him to pull weights with his chest thrown greatly forward; a percussive rotary machine for direct action upon the abdominal regions; a machine by which the body is elevated and depressed horizontally, or at an angle of about 45°, by the motion of the legs, and another by which a downward pressure of perhaps 50 pounds is exerted by the arms. Other such apparatus for the development of the muscles of the neck, fingers, wrists and ankles is also added as occasion requires. About four years of constant practice is required, according to the calculations of science, to turn out a human body with the muscles trained to the greatest capacity possible to the individual subject.

Besides the apparatus in the scientific gymnasium, every outdoor game has, of course, its own set of implements, the character, quality and variety of such articles keeping pace with the progress or popularity of the game. As baseball, for instance, became more and more popular, outfitters designed a special ball for the game, special shoes for the base-runners, and yet another kind for the pitcher; pillow-gloves, a wire mask and a chest-protector for the catcher (the mask and the chest-protector being later also adopted by the umpire); smaller gloves for the basemen, etc. As fast as the game developed a need, it was met by the enterprising manufacturers. The same statement is true of all the other outdoor sports, demand and supply having in all cases gone hand in hand.

C. H. COCHRANE.

ATHLETICS. See Vol. III, pp. 12, 13, for an account of the development of athletic sports in England and a description of their general character. The various important athletic games, such as baseball, tennis, etc., are described under their proper headings.

Athletics, though broadly including all forms of physical exercise, is technically applied to track and field contests, in contradistinction to baseball, cricket, football, etc. The track events are those of running, hurdling and walking, while the field-contests include jumping, weight-throwing and pole-vaulting. During recent years the interest taken in these sports has very greatly increased, especially in the United States. This awakened interest and increased patronage has shown itself most decidedly in the colleges and universities, and intercollegiate athletic contests command widespread attention. New records are constantly being established in all events, and the various athletic teams generally attain a degree of proficiency unequaled by their predecessors.

The standard events, which are usually contested in all games with little variation, are the following:

| TRACK. | FIELD. |
|---|---|
| 100-yard run. | Running broad-jump. |
| 220-yard run. | Running high-jump. |
| 440-yard run. | Throwing 16-pound hammer. |
| 880-yard run. | Putting 16-pound shot. |
| Mile run. | Pole-vault. |
| 120-yard hurdle-race. | |
| 220-yard hurdle-race. | |
| Mile walk. | |

To the foregoing, one or more bicycle-races are usually added. A three-mile run is characteristic of all English games, but that distance is very little run in America. In contests between two or more athletic teams, it is customary to have firsts count 5 points, seconds 2, and thirds 1. The officials at such games should be a referee, a clerk of the course, a starter, timers, judges of finish, inspectors, field-judges, and judges of particular events, such as walking, in which the contestants are liable to foul. All protests are finally decided by the judgment of the referee.

In the United States, amateur sport is controlled by the Amateur Athletic Union, under whose auspices the national championship games are held in September of each year. For records to be recognized and participants to maintain an amateur standing, all athletic games must receive the sanction of this Amateur Athletic Union. Intercollegiate athletics are under the control of the Intercollegiate Athletic Association and the Western Intercollegiate Athletic Association, which are, in turn, members of and subordinate to the American Athletic Union. In addition to these there are local athletic associations in all colleges or universities of any athletic standing.

One of the most important duties of these associations is to differentiate between amateur and professional athletes, and to decide all cases of protested men. Thanks to the energetic and persistent efforts made in recent years, amateur sport, formerly badly tainted with professionalism, has been made comparatively pure. Professional athletics have declined, and the thrill of honorably contending, and not material gain, has become the reward of all true sportsmen.

College athletic associations pay the traveling expenses of their teams, the salaries of their trainers and all incidental costs from gate receipts at their games and individual subscriptions. Members of the teams receive no remuneration in money, and their eligibility to participate in sanctioned games necessitates a good record in their college-work, indisputable amateur standing and a variable period of enrollment at the institution under whose colors they contend.

The most important athletic games of recent years were held in 1895, when, upon the 21st of September, the team of the New York Athletic Club, whose members were representative of American athletics, met that of the London Athletic Club, which contained the picked athletes of England. The Americans were victorious in all of the eleven events contested. These games were held upon Manhattan Field, New York City, and upon the same field, on the 5th of October, another international athletic "meet" was held. The latter was between the teams of Yale and Cambridge universities. The Americans won eight of the eleven events. In the previous summer the Yale team had been defeated upon English soil by the team of the University of Oxford.

ATHOL, a town in Worcester County, north-central Massachusetts. It is 26 miles by rail N.W. of Worcester. The graded schools are excellent, and there are large manufactures of silk, lumber, shoes, castings, etc. Population 1890, 6,319.

ATHOL, a hilly district in northern Perthshire, Scotland. In it is the Pass of Killiecrankie, where Claverhouse fell in 1689. The name has no legal significance, but is much used in the popular speech of that region. Area of Athol, 450 square miles.

ATKHAS, an Aleut tribe. See ALASKA, in these Supplements.

ATKINS, JOHN, politician, was born in Henry County, Tennessee, June 4, 1825; graduated from the University of East Tennessee in 1846; became a state senator in 1855, and was a member of Congress, 1857–61. At the time of the downfall of the Confederacy he was a member of the Confederate Congress, and was then returned to the Forty-fourth and to three succeeding Federal Congresses. From 1885 to 1888 he was United States commissioner of Indian affairs.

ATKINSON, EDWARD, economist, was born in Brookline, Massachusetts, Feb. 10, 1827, and was educated at various private schools and at Dartmouth College. He resides chiefly in Boston, where he is engaged in the business of insurance, but is best known as an economic statistician and frequent writer on social and industrial problems for magazines. He has concerned himself with the reduction of the cost of food, and has invented the "Aladdin oven," a device for preserving the nutritious qualities of food while cooking, with the least consumption of fuel. He has delivered numerous public addresses on banking, labor, manufacturing, railways and food-consumption. Among his books and pamphlets may be mentioned *Labor and Capital; The Distribution of Products; The Railway and the Farmer; The Railroads of the United States; The Industrial Progress of the Nation;* and *The Science of Nutrition.* He advocated free-trade theories and new plans of insurance, but became most widely known by his optimistic monographs relating to the welfare of wage-earners and the best use of their resources.



EDWARD ATKINSON.

ATKINSON, GEORGE W., Congressman, was born at Charleston, West Virginia, June 29, 1846. He graduated at the Ohio Wesleyan University in 1870, studied law, and was admitted to the bar in 1875. He was for four years United States marshal for the district of West Virginia; for six years postmaster of Charleston, West Virginia, and for six years a revenue agent of the Treasury Department. He was elected as a Republican from West Virginia to the Fifty-first Congress.

ATKINSON, JOHN CHRISTOPHER, author and clergyman, was born at Goldhanger, Essex, England, in 1814. He was graduated at St. John's College, Cambridge, in 1838, and in 1847 was appointed vicar of Danby, Yorkshire. The University of Durham conferred upon him, in 1887, the degree of D.C.L. He was the author of *Play-hours and Half-Holidays; Sketches in Natural History; Eggs and Nests of British Birds; The History of Cleveland;* and many papers concerned with local antiquities.

ATKINSON, LOUIS E., Congressman, was born in Delaware township, Juniata County, Pennsylvania, April 16, 1841. He graduated at the medical department of the University of the City of New York in 1861, and entered the United States army the same year, serving until 1865, when he was mustered out. He then studied law, and was admitted to the bar in 1870. He was elected to Congress as a Republican from Pennsylvania in 1883, and was continued in that service for 10 successive years.

ATKINSON, THOMAS, a Protestant Episcopal bishop, was born in Mansfield, Virginia, Aug. 6, 1807, and died at Wilmington, North Carolina, Jan. 4, 1881. He graduated at Hampden Sidney College, Virginia, in 1825, studied law, was admitted to the bar, and practiced for nine years. He studied for the ministry, and was ordained deacon in Norfolk, Nov. 18, 1836. He became priest the following year, and was consecrated bishop of North Carolina in St. John's Chapel, New York, Oct. 17, 1853.

ATLANTA, the "Gateway of the South," capital of Fulton County and of the state of Georgia, is situated in the northwestern part of the state, 1,087 feet above sea-level, and on a ridge which forms the watershed between the Gulf rivers and those of the South Atlantic slope. It was early known as the village of Marthasville, and received, in 1847 its municipal charter as "the City of Atlanta." The city, at the opening of the war had a population of more than 15,000 and became one of the strongholds of the Confederacy. When the memorable siege of Atlanta began on July 21, 1864, there were 30,000 people in the city. It fell on the 2d of September, and was totally destroyed in November, on the eve of General Sherman's famous "march to the sea," but having speedily risen from its ashes, and become the

center of a vast system of inland trade and transportation, it was made in 1868 the capital of the state. A magnificent new state capitol, costing over $1,000,000, was completed in March, 1891. The city limits comprise a geometrical circle three miles in diameter, in the center of which, with the principal streets as radii, is the union passenger depot, into which run ten lines of railway. The city has 62 miles of street-railway. Atlanta is the seat of numerous important educational institutions, among which are Atlanta University, Clark University, Atlanta Medical College, Atlanta Female Institute, Southern Medical Institute, Means' Boys' High School, Seney and Washington Female Seminary, Steen's School, Orphan Free School, English and German Select School, and the grammar and high schools of the city. The International Cotton Exposition of 1881, the Piedmont Park Exposition of 1887, and the Cotton States Exposition of 1895, on the preparation for which $2,000,000 were spent, were held here. Atlanta, as a trading point, receives 300,000 bales of cotton annually. There are 20 banks, 217 wholesale houses and 633 manufactories, employing 15,208 hands. The city is well built, having several handsome public edifices, and well-paved streets. Population 1880, 37,409; 1890, 65,533. In 1895 there were probably 100,000 residents of this chief city of Georgia, of whom about a third were of African descent. See ATLANTA, Vol. III, p. 15.

ATLANTA, a town and railroad junction in Logan County, central Illinois, is situated in a rich cereal-producing and stock-raising region, 39 miles by rail N.E. of Springfield. Coal is mined in the vicinity. Population 1880, 1,368; 1890, 1,178.

ATLANTA, a town of Cass County, north-eastern Texas, is 28 miles by rail N. of Jefferson and 31 miles S.W. of Texarkana. Lumber and cotton are brought in from the surrounding country. Population 1880, 396; 1890, 1,764.

ATLANTES, in architecture, are male figures sculptured into columns or pilasters for the support of an architrave. They were so named by the Greeks on account of the mythical Atlas. The Romans called them Telamones. Female figures employed in this way are called Caryatids or Caryatides.

ATLANTIC, an agricultural center of Iowa, county seat of Cass County, is situated on the east bank of East Nishnabatona River. Starch-works, a large canning factory, and pork-packing establishments are located here. Population 1890, 4,351; 1895, state census, 4,954.

ATLANTIC CITY, a city of Atlantic County, New Jersey, situated on the coast, 60 miles S.E. of Philadelphia. It is one of the most popular of the many fashionable sea-bathing resorts on the New Jersey shore. The beach is noted for its safety. Its summer population is about 50,000. Permanent population, 1890, 13,055; by state census of 1895 it was 18,329.

ATLANTIDES, female descendants of the mythological Atlas. They included the Pleiades, daughters of Pleione or Hesperis, and the Hesperides, and Hyades whose mother was Æthra.

ATLANTOSAURUS, a name given by Professor Marsh to what appears to be the largest dinosaurian reptile of which any remains have been preserved. The femur of this colossal monster is more than eight feet in length. The size of the bone indicates a length for the animal of nearly 100 feet, and a height of 30 feet or thereabouts. The remains were obtained in the Jurassic strata of Colorado.

ATLAS, a silk fabric interlaced with satin weaves, manufactured in the East. The word is Arabic, and means "smooth," "bare," hence it has been applied to smooth silk cloth.

ATLAS, one of the vertebræ. See ANATOMY, Vol. I, p. 821; Vol. XXII, p. 111.

ATLEE, WASHINGTON LEMUEL, American surgeon and author, was born in Lancaster, Pennsylvania, Feb. 22, 1808, and died there Sept. 6, 1878. He received his diploma from Jefferson Medical College in 1829. Until 1834 he practiced in the village of Mount Joy, when he removed to Lancaster and practiced for the next 10 years. In 1845 he became a professor in the medical department of the University of Pennsylvania, but resigned in 1853 and resumed his private practice. He was the author of valuable papers on medicine and chemistry. Among them are *Ovarian Tumors* (1873); *Struggles and Triumphs of Ovariotomy* (1875); and *Fibroid Tumors of the Uterus* (1876).

ATMOLYSIS, a method of separating a mixture of gases by their different rates of passage through a porous septum. This method was first made known in 1863 by its discoverer, Prof. T. Graham, master of the English mint.

ATMOMETER, an instrument used to determine the humidity of the atmosphere. It consists of a hollow ball of unglazed clay with a glass stem. The whole is filled with water and inverted in a dish of mercury. As the water, having passed into the pores, evaporates from the surface of the ball the mercury rises in the stem. If much water vapor is present in the atmosphere, condensation takes place in the pores and the mercury falls in the tube. The atmometer was invented by Sir John Leslie.

ATMOSPHERIC DUST. See CHEMISTRY, in these Supplements.

ATOLLS. See CORALS, Vol. VI, p. 378.

ATOMIC WEIGHTS, the proportions by weight in which the various elementary substances unite. There are two systems of atomic weights at present in use. First, the "old" system, which, after a good deal of discussion, was generally adopted about 1845; and second, the new system, which is in many respects a revival of the system of Berzelius, and which may be said to have come into general use by scientific chemists about 1860. See CHEMISTRY, Vol. V, pp. 467–471, and in these Supplements.

ATOMIZATION, a process of converting liquid into diffused spray for purposes of inhalation, first introduced in France by Salas-Girons. It is effected by forcing a fine jet of liquid against

either a solid body or a very strong current of air. Two vessels are arranged so that their single, minute orifices are brought together at right angles to each other. One contains the liquid to be atomized, and through the other air is forced so that in passing over the orifice of the former it draws up the contained liquid by rarifying whatever air may be over it. As soon as the liquid reaches the current of air passing over it, it is atomized. The same principle is used in pulverizing the oil used in oil-engines.

ATONEMENT, literally, at-one-ment, the act of reconciling persons at variance with each other, or the means by which the reconciliation is accomplished; in theology, the work of Christ by means of which God and man are reconciled, and specially his expiatory sacrifice on the cross.

The churches of the second century, like those of the first, proclaimed the life and death of Christ as facts, and were content, in doing so, to use Biblical language without deriving a theology from it. The churches of the third and fourth centuries were busily occupied with questions concerning the person of Christ, and hence did not work out a consistent doctrine of the atonement.

All the early teachers of Christianity regarded the death of Christ as a sacrifice and ransom, and ascribed to his blood the power of cleansing from sin and guilt. In the second century they often used the sign of the cross, and ascribed great efficacy to it. But that they had no definite theory of the atonement, is shown by Origen, who sometimes speaks of the death of Christ as a sacrifice to God, sometimes as an offering to Satan, and sometimes as a purifying moral influence.

After Origen, two theories of the atonement grew up slowly beside each other. One regarded the death of Christ as a sacrifice to God for the sins of men, and the other regarded it as a method of outwitting Satan, and thus of liberating believers. In the Nicene age the first was advocated by Athanasius and the second by Gregory of Nyssa. The second was for a time most generally accepted; but ere long a further study of the Scriptures gave the ascendency to the first, and it was generally, though not universally, accepted after the middle of the fifth century.

The theory that the death of Christ was a means of outwitting Satan continued to maintain a feeble existence till the eleventh century, when Anselm finally destroyed it by his great treatise entitled "*Why Did God Become Man?*" This work, though somewhat colored with the mental habits of its age, has held its place ever since as one of the most satisfactory discussions of a profound theme. Anselm finds in the death of Christ a satisfaction to the honor of God, of which sin had robbed him. The punishment of man would be a satisfaction for his sin, but it would also be his eternal destruction, and God yearns to save him. Yet God would be acting unjustly if he should let the sin of man go unpunished. Man must make the payment; yet man cannot, and be saved. Here is the explanation of the incarnation of Christ: God becomes man in Christ in order that the God-man may do what man must do, and what only God can do. The God-man owed obedience to God for himself; but, being sinless, he did not owe his death on the cross. He presented to God this sacrifice of his life. This noble deed must be rewarded. But the Son of God already owns all things, and nothing can be given to him. Therefore the reward which is his due is given to those for whom he died.

This view reigned with but little opposition till the middle of the seventeenth century, when Grotius published his treatise on the satisfaction of Christ, written to defend "the Catholic doctrine" of the atonement. But his doctrine proved to be substantially new. It is stated thus by Fisher: "The relation of God to man is that of a ruler to a subject. A ruler has a right to remit a penalty, provided the end for which the penalty is ordained is otherwise attained. This end is the preservation of order, and the prevention of future transgression. The death of Christ secures this end, as being a 'penal example'; that is, as showing impressively what sin deserves. It is not actual punishment, but rather a symbol of it." The impressive sufferings of Christ exhibit to the universe God's hatred of sin, and thus create respect for his law, which sin has dishonored. God can now pardon the penitent without encouraging sin by a manifestation of too great leniency. This is called the "governmental theory." It is accepted by the Arminians in general, and by a large part of the Calvinists, and may now be said to divide the Christian world with the Anselmic theory. Many hold both, and believe that each, in this union, strengthens the other.

Both these views have been modified in certain details since their origin; but in essence they remain the same. For example, the modern theologian of the Anselmic school represents the essential justice of God as demanding the punishment of sin, instead of his honor, of which Anselm speaks.

Some other theories of the atonement deserve to be mentioned, as they have exercised a certain influence over Christian thought. The moral theory goes back to Abelard and the twelfth century. It regards the life and death of Christ as having no special relation to either the essential justice or the governmental arrangements of God, but as being a presentation of his infinite love in an impressive form adapted to touch and constrain the heart of man. The vital theory of Schleiermacher affirms that Christ came into the world to give life to men; that his redemptive agency consists in imparting to them, through the attractive power which he exerts upon them, an inward consciousness of fellowship with God which masters every other feeling; and his atoning work is the communication to them of his own blessedness, which grows out of his communion. The theory usually associated with the name of Edward Irving affirms that the Logos took to himself in the incarnation a fallen human nature;

that he held this above actual sin, though not above temptation; that he purified it perfectly through the discipline of life and death, and thus established a new humanity; and that sinners appropriate to themselves the power of this new humanity by faith, which brings them into contact with it.

The literature of this subject most accessible to the reader are the histories of doctrine and dogma by Hagenbach, Harnack, Sheldon and Fisher, and the treatises on systematic theology by Strong, Hodge, Shedd and others.

FRANKLIN JOHNSON.

ATRAULI OR ATTROWLEE, a town of British India, in Meerut, one of the Northwest Provinces, 22 miles N.E. of Aligarh, was founded about the twelfth century. It is well built, with wide streets, a good bazaar, and an abundant supply of water. Population 15,000.

ATROPA OR ATROPIN, an alkaloid existing in all parts of the deadly nightshade (*Atropa Belladonna*). A solution of sulphate of atropin is found to be efficacious in diagnosing certain maladies of the eye, as a small drop of it will dilate its pupil. See NARCOTICS, Vol. XVII, pp. 231, 232.

ATRYPA, a fossil brachiopod which resembled the living genus *Terebratulina*. The brachial appendages were borne on spiral plates. They were most abundant during Silurian times.

ATTACAPAN INDIANS, a family of North American Indians early inhabiting what is now southwestern Louisiana. From the fragments of their tongue extant it is believed that they spoke a characteristic language. The Coco and Hiyeketi are the only tribes of this family of which anything is known. The part of Louisiana inhabited by them is still sometimes called "Tuckapa" or "Old Attacapa" country. The word *Attacapa* was never used by members of the family, but was a name of ridicule, used of them by their enemies. A similar word in the Choctaw tongue signifies "man-eater." The name was used earlier than 1750 of some Texan tribes believed to be cannibals.

ATTACHMENT, in law, is the act of taking a person or his property into custody by virtue of an order or writ issued by a court. The term is applied both to the act and the writ. An attachment against the person is of general use by the courts in the United States for the purpose of bringing before the court one who has been guilty of contempt by refusing to obey the process of the court, or an injunction, or for openly insulting the court. The proceeding under an attachment against the person is in the nature of a criminal proceeding, and the punishment is by fine or imprisonment.

Attachment of property to enforce the payment of a debt is a remedy provided by statute in all of the states. Writs of attachment commanding the sheriff or other proper officer to seize such property, rights, credits or effects of the defendant as may be necessary to satisfy the plaintiff's demand may be issued when the suit is begun or during its progress. In most states, before an attachment will be issued it is necessary that an affidavit be filed stating that the defendant is not a resident of the state, or that he is about to depart from the state, or to conceal or dispose of his property for the purpose of hindering and delaying his creditors, or that he has concealed or disposed of his property for such purpose. It is also generally necessary that the plaintiff furnish a bond sufficient to indemnify the defendant if the attachment should not prove to be well founded. The prime object of attachment is to secure property from which the plaintiff's demand may be satisfied in cases where the defendant is a non-resident, or is attempting to defeat the claim of the plaintiff through fraud. The remedy in most states is exclusively a remedy at law, but in a few states it is permitted in chancery proceedings. The defendant is usually permitted to retain possession of the property attached by giving a bond to produce the goods or pay such judgment as may be rendered against him, but this does not release the lien. Where two attachments are levied at the same time, they will be entitled to *pro rata* shares in the proceeds of the property. In some states the same rule will apply to all who attach the property during the same term of court. Garnishment or trustee process is usually supplemental to attachment, by means whereof the plaintiff may summon any one who may have property or funds belonging or due to the defendant, to answer as to such property and hold it until the determination of the suit for the use of the plaintiff if he obtains judgment. The person thus served with garnishment summons must not turn over to the defendant any funds or property of the defendant he may have in his possession, as he will be obliged to account therefor to the plaintiff, if the plaintiff procures a judgment in his suit. If an attachment is levied maliciously, or without proper grounds, the plaintiff will be liable to the defendant for all damages which result. See ATTACHMENT, Vol. III, p. 51.

ATTALEA, a genus of palms, comprising a number of species natives of the tropical parts of South America. The fruit is a dry, fibrous husk, inclosing a nut with three cells and three seeds. The leaves of some species are much used for thatching, some are woven into hats, mats, etc. The nuts of some are burned to dry india-rubber, which acquires its black color from their smoke. The seeds of *A. funifera*, called "coquilla-nuts," are as large as ostrich-eggs, and supply a kind of vegetable ivory, used for making umbrella-handles, etc. The trees are stately and beautiful.

ATTALLA, a town and railroad center of Etowah County, northeastern Alabama, is 56 miles N.E. of Birmingham, and but a few miles below the southern end of Lookout Mountain. The town has developed with the iron region, near whose center it lies. It is also an important shipping-point for cotton. Population 1880, 351; 1890, 1,254.

ATTALUS, FLAVIUS PRISCUS, Arian emperor of Rome, proclaimed such by Alaric, A.D. 409;

deposed by him in 410, and banished by Honorius, 416. See ROME, Vol. XX, p. 780.

ATTALUS, two kings of Pergamos, both allies of the Romans: born 269, died 197 B.C.; born 220, died 138 B.C. See PERGAMUM, Vol. XVIII, p. 527.

ATTAMAN OR HETMAN, an order of Cossack chiefs. See HETMAN, in these Supplements.

ATTEMPT, in criminal law, is an unsuccessful endeavor to commit a crime, accompanied by facts which constitute not mere preparation alone, but an actual physical effort showing an intent to carry it into effect. In most states a punishment is fixed by statute for an attempt to commit a crime, and varies according to the nature of the crime attempted.

ATTERBURY, WILLIAM WALLACE, Presbyterian minister, was born of Huguenot parentage at Newark, New Jersey, Aug. 4, 1823. He is an alumnus of Yale, and after holding pastorates in Lansing, Michigan, and Madison, Indiana, became, in 1869, secretary of the New York Sabbath Committee, with which he has since been associated; has traveled, lectured, and written extensively for the press.

ATTESTATION is the act of witnessing an instrument in writing and signing it as a witness at the request of the person executing it. A deed which has been acknowledged before a notary public or other officer authorized to take acknowledgments does not require attestation in order to be valid. Attestation is made necessary to the execution of a will by statute in all the states. Generally, three persons must witness a will, which must be done in the presence of the testator. Attested writings can usually be proved by producing one or more of the witnesses in court, or if none of them can be produced, by proving the signature of at least one witness. The witnesses need not see the person executing the instrument, but must sign at his request and in his presence, and generally in the presence of each other.

ATTFIELD, JOHN, chemist and pharmacist, was born, Aug. 28, 1835, in Hertfordshire, England, and has been since 1862 professor at the Pharmaceutical Society's School. From 1854 to 1862 he was demonstrator of chemistry at St. Bartholomew's Hospital, London. He is the author of *A Manual of Chemistry, General, Medical and Pharmaceutical*, and of numerous works on kindred subjects.

ATTICA, town and railroad center of Fountain County, west-central Indiana, is on the Wabash River, and 21 miles W. of Lafayette. Carriages and agricultural implements are manufactured here, and sandstone is quarried in the vicinity. Population 1880, 2,150; 1890, 2320.

ATTICA, town of Wyoming County, western New York, is 31 miles E. of Buffalo and at a railway junction. A collegiate institute is located here. Population 1880, 1,935; 1890, 1,994.

ATTLEBORO, a town of Bristol County, southeastern Massachusetts, 31 miles by rail S.W. of Boston. It has manufactories of jewelry, buttons, braid, etc. Population 1880, 11,111; 1890, 7,577. In 1880 North Attleboro was included in the census.

ATTLEBOROUGH, a market town of some antiquity in Norfolk, England, 16 miles S.W. of Norwich, by rail. It has a college of the Holy Cross (1387), and its cruciform parish church contains some interesting monuments. Population, 2,244.

ATTORNEY. An attorney is one who acts for another through express appointment. An attorney in fact is one to whom another delegates his authority to do some special act or to transact business generally. Such authority is usually given in writing, which instrument is called a "power of attorney." All persons who are capable of transacting business for themselves, including married women and minors, are legally qualified to act as attorneys in fact. An attorney at law is an officer of a court of record who is legally authorized through appointment of the supreme court of the state in which he acts, or of the United States, to conduct and manage a cause in court on behalf of one of the litigants. The rules regulating the eligibility of persons to become attorneys at law are regulated by the state statutes and rules of courts. Male citizens of the age of 21 years may become attorneys at law upon complying with conditions prescribed in the various states. In some states, and in the courts of the United States, women may become attorneys at law upon meeting the requirements provided. An attorney has full power, within the scope of his employment, to act for his client and to bind the client by his act. Because of the confidential relation between an attorney and his client, an attorney is privileged from disclosing his client's secrets when called as a witness. For official misconduct an attorney may be disbarred and his name stricken from the roll, which forever afterward disqualifies him from the office of attorney. See ATTORNEY, Vol. III, p. 62.

ATTORNEY-GENERAL, the name applied to the attorney at the head of the department of law of the government of the United States or of a state. The Attorney-General of the United States is one of the officers of the President's Cabinet, by whom he is appointed to the office. His duties are chiefly to act as legal adviser to the President and the other Cabinet officers, and to conduct, on behalf of the United States, all its litigation in the supreme court. The attorney-general of a state holds his office by election. His duties are to appeal, for the people, in suits in which the state is a party, and to conduct certain kinds of prosecutions and investigations, in the name of the people of the state, against corporations and other business concerns who may be transacting business in a manner contrary to the law of the state. He is also an advisory officer to the governor and other state officers. See LAW, DEPARTMENT OF, in these Supplements.

ATTUCKS, CRISPUS, a half-breed Indian, or mulatto, killed in the Boston massacre, March 5, 1770. He was the leader of the mob which attacked the the British troops on that occasion.

He was a resident of Framingham, and is supposed to have been about fifty years of age at the time of the massacre. A monument was erected to his memory on Boston Common in the year 1888; but a serious doubt, founded upon a discovery of old documents in Boston about 1894, is expressed as to the truth of the tradition.

ATWATER, LYMAN HOTCHKISS, an American scholar, was born at New Haven, Connecticut, Feb. 23, 1813, and died at Princeton, New Jersey, Feb. 17, 1883. He graduated at Yale in 1831, at the theological seminary there in 1834, and was ordained pastor of the Congregational Church at Fairfield, Connecticut, in 1835, remaining there for 19 years. In 1854 he became professor of mental and moral philosophy in Princeton, and in 1869 was made professor of logic and of moral and political science. He edited the *Princeton Review*, and published a *Manual of Elementary Logic* (1876).

ATWATER, WILBUR OLIN, chemist and scientific agriculturist, was born at Johnsburgh, New York, May 3, 1844; graduated from Wesleyan University in 1865; and took Ph.D. at Yale in 1869, afterward studying chemistry in Germany. Since 1873 he has been professor of chemistry at his *alma mater*, and since 1888 also associated with the Central Bureau of Agricultural Stations at Washington, District of Columbia. His chief work has been in researches as to the nutritive and economic value of dietaries, on which he is one of the first living authorities. In these pursuits he devised a bombcalorimeter in which to inclose animals or men for the determination of "the laws of the conservation of matter and of energy in the living organism." He has published numerous articles of a popular and scientific nature in the *Century Magazine* and other periodicals, relating to his food investigations, and he founded the *Experiment Station Record*.



W. O. ATWATER.

ATWILL, EDWARD ROBERT, first Protestant Episcopal bishop of West Missouri, was born at Red Hook, New York, Jan. 18, 1840, and was consecrated Oct. 14, 1890. He is an alumnus of Columbia College, New York, and the General Theological Seminary, and before his consecration served in the dioceses of New York, Vermont and Ohio.

ATWOOD, capital of Rawlins County, northwestern Kansas, is on Beaver Creek, and on the Burlington and Missouri River railroad, in a farming community. Population 1890, 450; 1895, 711.

ATWOOD'S MACHINE. See MECHANICS, Vol. XV, p. 716.

AUBANEL, JOSEPH MARIE JEAN BAPTISTE THÉODORE, poet and orator of Provence, was born at Avignon, France, March 26, 1829, and was called the "French Petrarch." He did more, perhaps, than any other to restore the Provençal tongue to its former literary dignity. He was one of the founders of the Société de Félibrige and established many of the schools of Felibres now existing in southern France. In the restored Provençal tongue he has written *La Miougrano Entraduberto; La Perlo; La Ventoux;* and *Lou Castelas;* poems, and a drama entitled *Lou Pan dou Pecat.* He died at Avignon, Oct. 31, 1886.

AUBARET, LOUIS GABRIEL GALDERIC, naval officer and Orientalist, was born at Montpelier, France, May 27, 1825; retired from the navy in 1867 with the rank of captain, and in the same year became consul at Scutari. During the war with China he was in command of the advice-boat *Le Pregent*, and was an official interpreter. He translated from the original Chinese text a *History and Description of Lower Cochin-China; Laws and Regulations of the Kingdom of Annam;* and is the author of an *Annamite Grammar* and a *French-Annamite Dictionary.* He was made an officer of the Legion of Honor, Dec. 31, 1861. He died Aug. 21, 1893, at Poitiers.

AUBÉ, JEAN PAUL, sculptor, was born at Longwy, France, May 3, 1837; was a student at the School of Fine Arts, Paris, and went to Italy in 1866 to work at decorative sculpture. His first work to appear at the Salon was a marble bust, *Prosper Mérimée* (1873). Among his notable achievements since then are *La Sirène; Pygmalion; Dante Alighieri; La Guerre; Fête d'Enfant;* and a number of marble busts of eminent Frenchmen. In 1884 he executed the monument of Gambetta erected in the Place du Carrousel. He received the decoration of the Legion of Honor Oct. 14, 1873.

AUBER, CHARLES AUGUSTE, ABBÉ, priest and archæologist, was born at Bordeaux, France, June 22, 1800, and became canon of Poitiers in 1846. Among his extensive writings may be mentioned *The Catholic Priesthood in China; General Considerations upon the History of Christian Symbolism; The Catacombs; History, General, Civil and Religious, of Poitou;* some lives of pious men, and some antiquarian treatises.

AUBERLEN, KARL AUGUST, an orthodox theologian, was born at Fellbach, in Württemberg, Nov. 19, 1824, and died at Basel, May 2, 1864. He was the author of several works, among them *The Prophet Daniel and the Revelation of John Considered in Their Reciprocal Relations*, and *The Divine Revelation, an Essay in Defense of the Truth.*

AUBERT, JEAN LOUIS, ABBÉ, fabulist and poet, was born at Paris in 1731 and died there in 1814. He was for many years editor of *Les Petites Affiches*, a very popular journal, and he became immediately famous after his publication, in 1756, of a collection of fables. Voltaire regarded them the equals of the famous fables of La Fontaine. From 1773 until his death he was professor of French literature in the Collége Royal, Paris.

AUBERT DU BAYET, JEAN BAPTISTE ANNIBAL, French general, was born in Louisiana, Aug. 29, 1759, and died at Constantinople, where he was ambassador, Dec. 17, 1797. During the war of the American Revolution he fought with the Continental army, being on the staff of Rochambeau. He was elected to the French legislative assembly in 1791, and during the revolution of 1793 commanded at Mainz, which fell, after a siege, into the hands of the Prussians. During several months of 1795 he was minister of war.

AUBERTIN, CHARLES, litterateur, was born at Saint Dizier, France, Dec. 24, 1825, and has been professor of literature at the University of Dijon since 1879. He was made a member of the Legion of Honor, Aug. 15, 1864. Among his extensive critical writings are *Critical Study of the Supposed Correspondence between Seneca and St. Paul; The Public Spirit of the Eighteenth Century; History of French Language and Literature of the Middle Ages.* He has published numerous annotated editions of classical French and Latin authors.

AUBERVILLIERS, a city in the Seine department, France, is about 5 miles N. of Paris, and has a fort which is included within the system of fortifications of the capital. Its industries are iron-founding, manufactures of caoutchouc, paper, varnished leather, glass, and chemicals. Population, 22,223.

AUBLET, ALBERT, painter, was born in Paris in 1855, and after pursuing the courses at the School of Fine Arts, made his *début* at the Salon 1873. *La Prière; Les Derviches Hurleurs de Scutari; La Petite Marquise; A Street in Cairo, as seen at the Paris Exposition* (1889); and *Chrysanthemums* are among his best-known works. He received a gold medal at the Salon of 1889.

AUBURN, a town of Lee County, east-central Alabama, is the seat of the Alabama Agricultural and Mechanical College. It is 60 miles by rail from Montgomery. Population 1890, 1,440.

AUBURN, capital of Placer County, northeastern California, is a popular health-resort, on two railroads, and 36 miles N.E. of Sacramento. Breweries and manufactures of wine are located here, and 8 miles S. is the remarkable Alabaster Cave. Rich quartz-mines are in the vicinity. Population 1890, 1,440.

AUBURN, capital of De Kalb County, northeastern Indiana, is on two railroads, and 22 miles N. of Fort Wayne. Two natural gas-wells are in use here, and there are manufactures of furniture and agricultural implements. Population 1890, 2,415.

AUBURN, a city and capital of Androscoggin County, southwestern Maine, is on the Androscoggin and Little Androscoggin rivers, which furnish an immense water-power. It is the seat of extensive cotton and shoe manufacturing industries. Population 1890, 11,250. Its recent growth has been rapid and accompanied by good municipal improvements.

AUBURN, manufacturing town, and capital of Nemaha County, southeastern Nebraska, is on two railroads, 65 miles S. of Omaha, and 72 miles S.E. of Lincoln. Population 1890, 1537.

AUBURN, a city of New York, county seat of Cayuga County. It is handsomely built on both sides of the outlet of Owasco Lake, which is the source of supply for the Auburn water-works, and which furnishes a valuable water-power for the extensive factories of the city. These include manufactures of thrashing-machines, reapers, mowers, binders, woolen and cotton fabrics and iron. The gardens and residences of the city are remarkable for their beauty. A state insane asylum and a state prison are located here. Population 1890, 25,858. See AUBURN, Vol. III, p. 66.

AUBURN THEOLOGICAL SEMINARY, a Presbyterian institution, is located at Auburn, New York, and was founded in 1818 by the Synod of Geneva. It is controlled by a board of commissioners, three of whom are elected by each of 18 presbyteries, and this board appoints trustees and professors. The doctrine of the seminary is strictly Calvinistic. It owns and occupies a group of stone buildings on a large campus, valued at $300,000, and productive funds computed at $637,000. The annual attendance of students averages about 90.

AUBUSSON, PIERRE D', grand master of the Order of St. John of Jerusalem, was born in France in 1423; died at Rhodes in 1503. His early history is imperfectly known, but he is said to have borne arms, when very young, against the Turks in the wars in Hungary, and to have distinguished himself by the zeal and valor he displayed. See ST. JOHN OF JERUSALEM, Vol. XXI, p. 174.

AUCHENIA, a genus of ruminating quadrupeds, of which the llama and alpaca are the best known. See ALPACA, Vol. I, p. 597; LLAMA, Vol. XIV, p. 738.

AUCHINLECK, a village of Ayrshire, southern Scotland, 15 miles E. of Ayr. The parish contains Auchinleck House (locally called "Place Affleck"), the seat of the Boswell family. Near the mansion, Sir Alexander Boswell, son of Johnson's biographer, established in 1815 the Auchinleck Press, for printing rare works, such as the *Romance of Sir Tristram;* the *Disputation between John Knox and the Abbot of Crossraguel*, etc. Population, 1,528.

AUCHMUTY, RICHARD TYLDEN, philanthropist, was born in New York City, June 28, 1831; died at Lenox, Massachusetts, July 18, 1893. He had a collegiate education and then became an architect. After his service with the Union army he retired from business and devoted himself to philanthropic works. His home was in Lenox. He and his wife established the New York Trade Schools in 1881 in which they sought to shorten the time of acquisition of trades by teaching theories of mechanical work. The plans were carefully advised and elaborated. These schools, which were incorporated in 1889, and are located in New York City, are attended by more than 500 students. His family contributions to it were large, probably over $200,000, to which J. P. Morgan added $500,000.

AUCHMUTY, SAMUEL, an Episcopal clergyman, was born in Boston, Jan. 16, 1722; died in New York City, March 4, 1777. He was an alumnus of Harvard, and in 1764 became rector of Trinity parish, New York; was an adherent of the Royalist party during the Revolution.—SIR SAMUEL AUCHMUTY, British general, son of preceding, was born in New York, June 22, 1756; died in Dublin, Aug. 11, 1822. He served with the king's troops during the war for independence, and after service in India became a general in 1806, and was in command of the army which, in 1807, won Montevideo, South America, from the Spanish, and in 1811 took Java from the Dutch.

AUCOC, JEAN LÉON, lawyer and politician, was born in Paris, Sept. 10, 1828. He was a pupil at the school of the administration, and after service under the minister of the interior, became, in 1869, councilor of state. Deposed by the revolution of 1870, he was re-elected to the same office July 22, 1872. In that year he became superior councilor of agriculture, commerce and manufacture. He was made a grand officer of the Legion of Honor, July 9, 1891. He is the author of *Concerning Sections of the Commune; Introduction to the Study of Administrative Right; The Institute of France;* and *The Council of State Before and Since 1789.*

AUCUBA, a genus of plants of eastern Asia, of the family *Cornaceæ.* The best-known species is *A. Japonica*, long under cultivation, and prized for its mass of glossy, mottled leaves and coral-red berries.

AUDE (ATAX), a river in the south of France. It rises in the eastern Pyrenees, not far from Mont Louis; flows for some distance parallel to the canal of Languedoc, and falls into the Mediterranean 6 miles N.E. of Narbonne, after a course of more than 130 miles. It is almost wholly within the department of Aude.

AUDEBRAND, PHILIBERT, journalist and author, was born at Saint-Amand-Montrond, France, Dec. 31, 1815. He was educated at the Seminary of Bourges and at Paris, and began in 1845 to write for newspapers. His contributions were of the nature of stories and conversations, and were mostly printed in the *Gazette de Paris.* He has been a voluminous writer, and among his larger works may be mentioned *Voyage and Adventures around the World; The Enchantress; The Secret of Chamblis;* and *The Daughter of Cain.*

AUDIFFRET, CHARLES LOUIS GASTON, MARQUIS D'; born in Paris Oct. 10, 1787; died there April 28, 1878. On the completion of his studies in 1805 he entered the administration of the finances, and in 1812 became chief of the bureau and auditor to the council of state. On the return of the Bourbons in 1814 he was made chief of division and chevalier of the Legion of Honor. Appointed director of petitions in 1817, he became councilor of state in 1828, and was made president of the court of accounts in 1829. This last position he held during 30 years, resigning it in 1859 to become president of the administrative council of the Society of Commercial and Industrial Credit. Meantime, under Louis Philippe, he held a seat at the Luxembourg, as a peer, from 1837 to 1848, and was made a senator under the Empire. In 1847 he had been made grand officer of the Legion of Honor, and he received the grand cross in December, 1869. He published several works on finance.

AUDIFFRET-PASQUIER, EDMÉ ARMAND GASTON, DUC D', a French statesman, was born at Paris, Oct. 23, 1823. He was the son of Count d'Audiffret, but being adopted by his grand-uncle, Baron Pasquier, became heir to the title of duke, conferred upon the baron in 1844. He became auditor of the council of state in 1845. His liberal opinions prevented his holding any important office under the Empire, but in 1871, after the fall of the Empire, he became prominent as leader of the moderate conservatives in the assembly. He was strongly opposed to the Thiers government, and became one of the leaders of the Right Center. After the fall of that government, in 1874, he was elected vice-president of the national assembly, and president in 1875. The republican constitution of France was adopted by the assembly during his presidency. In December, 1875, he was elected permanent senator, and in March, 1876, became president of the senate. He was elected to the Academy in 1878.

AUDIOMETER OR AUDIMETER, an instrument for measuring the sense of hearing, and recording it upon an arbitrary scale. It is really an induction balance used in connection with a microphone and a telephone-receiver. Induction coils are placed upon the opposite ends of a frame or bar. These are in connection with a battery, and in the circuit are a microphone and a sound-receiver. When an intermediate sliding coil is equidistant from the end coils, through which an intermittent current is passing, there will be the most induction, and the sound of a ticking clock or other noise will be heard. As the central coil is passed along the bar or frame, a point will be reached where the induction is balanced and no sound can be heard.

AUDIPHONE, an instrument invented in 1879 by Mr. Rhodes, of Chicago, to assist the hearing of deaf persons whose auditory nerve is not entirely destroyed. It consists of a diaphragm, or plate, made of a fan-shaped sheet of vulcanized rubber, whose lower end is placed against the upper front teeth. When so placed it communicates the vibrations caused by sound to the teeth and the bones of the skull, and thence to the organs of hearing. The rubber must be tightened in proportion to the deafness of the person using the instrument.

AUDITOR. An auditor is an officer whose duty it is to examine accounts for the purpose of ascertaining whether they have been properly kept, and whether disbursements are properly made. An auditor, in legal proceedings, is an officer appointed by the court for the purpose of ascertaining and stating the items of account between the parties to a suit, where unsettled

accounts are in question. He may examine vouchers, hear testimony and do such other acts as will enable him to properly state the account. An auditor's report, stating the account, is in the nature of recommendation to the court, and the court may approve, set aside, or refer it back for further examination. See AUDITOR, Vol. III, p. 69.

AUDITORY NERVE. See ANATOMY, Vol. I, p. 893.

AUDLEY, SIR JAMES, one of the original knights of the Order of the Garter. He was frequently in personal attendance on Edward, the Black Prince, whom he accompanied to France in 1346, and subsequently to Spain. He showed great valor in the battle of Poitiers in 1356; died at Fontenay-le-Comte, France, 1369.

AUDLEY, THOMAS, LORD AUDLEY OF WALDEN, jurist, was born in Essex, England, 1488; died in London, April 30, 1544. He was speaker of the House of Commons under Henry VIII in 1529, and became Lord Chancellor in 1533; was created Baron Audley in 1538. He is censured for having complied with the dictation of Henry VIII at the trial of Sir Thomas More, over which he presided.

AUDRAN, EDMOND, a French composer of comic opera, as well as of overtures and chamber music, was born in Lyons, April 11, 1842, and was the son of a singer. He won prizes at the Niedermeyer School, became organist of St. Joseph's Church in Marseilles; produced there *La Chercheuse d' Esprit* and *La Nivernaise;* went in 1881 to Paris, and there, with collaborators, wrote *La Mascotte*, *La Dormeuse Éveillée*, *Pervenche*, *Le Paradis de Mahomet*, *Miss Helyett*, *L'Œuf Rouge*, and other examples of *opéra bouffe*, some of which are familiar to English and American theaters.

AUDUBON, capital of Audubon County, southwestern Iowa, is on two railroads, and 107 miles W. of Des Moines. It lies in the midst of a farming and stock-raising region. Population 1890, 1,310; 1895, 1,585.

AUENBRUGGER, LEOPOLD. See AVENBRUGGER, Vol. III, p. 145.

AUER, ALOIS, linguist and inventor, was born at Wels, Austria, May 11, 1813; died at Heitzing, July 10, 1869. In 1844 he published the Lord's Prayer in 603 languages, and in 1854 made the discovery of nature-printing, an important advance in the science of photography. He was director of the state printing establishment at Vienna.



BERTHOLD AUERBACH.

AUERBACH, BERTHOLD, author, was born of Hebrew parentage at Nordstetten, in the Black Forest of Germany, Feb. 28, 1812; died at Cannes, France, Feb. 8, 1882. He was educated at Tübingen, Munich, and Heidelberg universities, and was imprisoned in 1836 for joining the Burschenschaft. Under the influence of Spinoza's teaching, he renounced Judaism to devote himself to philosophy and literature. His *Village Stories Told in the Black Forest* won him early recognition, and gave a new direction to nineteenth-century pastoral literature. His *On the Heights* is oonsidered by many one of the best works of fiction. Among his other works, which have been extensively translated, are *The Villa on the Rhine; Edelweiss;* and *The Professor's Lady.* He translated into German the works of Spinoza. Among his other novels are *Brigitta; Aloys; Master Bieland;* and *Waldfried.* He produced nearly forty volumes. His earliest work was on *Judaism and Literature* (1836).

AUERSPERG, ADOLPH WILHELM DANIEL, PRINCE, was born July 21, 1821; died in his castle, Goldegg, near Vienna, Jan. 5, 1885. His father was Prince Wilhelm Auersperg. In 1870 he left the military service, having attained the rank of major of dragoons. In 1867 he was elected president of the Bohemian diet to succeed Count Hartig; was made, in the succeeding year, life member of the upper chamber of the Austrian Reichstag, and in 1870 governor of Salzburg. On Nov. 25, 1871, he became president of the Austrian ministry, his predecessor having been Count Beust. He led the policy of the German party in the Austrian government.

AUERSPERG, ANTON ALEXANDER VON. See GRÜN, ANASTASIUS, Vol. XI, p. 224.

AUERSPERG, KARL, PRINCE, a Bohemian of vast estates who favored a moderately liberal government with a sufficient German ascendency over his native country to secure the unity of Austria. He was born May 1, 1814, and died Jan. 4, 1890, and was a brother of Prince Adolph, premier of the empire, and sketched above. In 1861 he was president of the Bohemian Upper House, and in 1867 succeeded Balcredi as chief of the Imperial cabinet in what was called the "bourgeois ministry." He did not like Count Von Beust's policy of balancing Hungarian and Czech with German influences, although an upholder of the unity of the empire, and in 1868 retired from court life. He presided over the Bohemian diet in 1882–84, when it was dissolved. The rivalry of the Auersperg and Schwarzenberg princely houses was of great importance in shaping the political affairs of Bohemia.

AUERSTÄDT, a village in the Prussian province of Saxony, 10 miles W. of Naumburg. It is famous for the battle which took place there Oct. 14, 1806, between the French under Davoust and the Prussian army under Duke Charles of Brunswick, which resulted in a great victory for the former. The Prussians, who numbered fully 48,000, left nearly half their men dead or wounded on the ground, while the French (30,000) escaped with a loss of only 7,000. Napoleon, who had on the same day defeated the main army of Frederick William III at Jena, made Davoust duke of Auerstädt.

AUFRECHT, THEODOR, Oriental philologist, was born at Leschnitz, in Upper Silesia, Jan. 7,

1822. After studying at Berlin under Bopp, Böckh and Lachmann, he settled there in 1850, and devoted himself to Sanskrit and the old German tongues. To this time of his life belongs his collaboration with Kirchoff in the publication of *Umbrische Sprachdenkmäler* (2 vols.; Berlin, 1849–51), —an epoch-making work in the comparative study of the languages of ancient Italy,—as well as the founding of the well-known *Zeitschrift für Vergleichende Sprachforschung* (1852), in the editing of which he assisted A. Kuhn for some time. In 1852 he went to Oxford, where he helped Max Müller in his edition of the *Rigveda*, and was appointed to a place in the Bodleian Library, the fruit of which was his excellent *Catalogus codicum Sanscritorum bibliothecæ Bodleianæ Oxoniensis* (1864). In 1862 he became professor of Sanskrit and comparative philology at Edinburgh, and in 1875 resigned this chair for one at Bonn. Aufrecht has published scholarly editions of several classical Sanskrit works, the most important being his *Rigveda*, in the Roman character (2d ed., 2 vols.; Bonn, 1877), and his *Catalogus Catalogorum*, in 1891.

AUGIER, Guillaume Victor Émile, a French dramatist; born at Valence, Sept. 17, 1820; died at Croissy, Oct. 25, 1889. He was bred for an advocate; succeeded with his play *La Ciguë* at the Odeon, 1844, and gave himself up to literature. As against the extravagances of the Romanticists, he opposed "good sense," but he was too much of an idealist and moralist to accept the methods of realism. In 1849 his metrical drama *Gabrielle* obtained the Montyon prize of the Academy, chiefly on account of its purity of purpose. His *Diane* and *Paul Forestier* are plays in verse. In prose his comedies pursued the methods of intrigue. Among them are *Le Mariage d'Olympe; Les Lionnes Pauvres; Le Fils de Giboyer; Maître Guerin; Madame Caverlet;* and *Les Fourchambault.* One of his earliest works, *L'Aventurière*, long kept possession of the stage and the fame of being one of his best productions. In 1858 he became an Academician, and ten years later the commander of the Legion of Honor.

AUGITE or PYROXENE, a mineral very nearly allied to hornblende. See Mineralogy, Vol. XVI, p. 416.

AUGMENTATION, in music, the reproduction of a melody, or principal subject of a composition, in the course of the progress of the piece, in notes of greater length than those in which the melody is first introduced.

AUGSBURG, Apology of. See Creeds, Vol. VI, p. 564.

AUGUR, Christopher Colon, soldier, was born in New York in 1821. He graduated at West Point in 1843, and served during the Mexican War as aide-de-camp to General Hopping, and later to General Caleb Cushing. He served as captain against the Indians in Oregon in 1856, and in 1861 was appointed major in the Thirteenth Infantry. The same year he became a brigadier-general of volunteers, and was severely wounded in July, 1862, during the battle of Cedar Mountain. Subsequently he served in General Banks's expedition against New Orleans; was in command of the Baton Rouge district, and was engaged in the siege of Fort Hudson. He was retired July 10, 1885, having been breveted major-general for gallant and meritorious service in the field. From 1871 until his retirement he was in command of the department of Texas.

AUGUSTA, a trading-town and capital of Woodruff County, northwest Arkansas, is situated on the east bank of the White River, in a township of the same name. It deals chiefly in cotton, which is here shipped by steamboat, and is the seat of a good high school. Population 1890, 519; of township, 4,292.

AUGUSTA, an important commercial and manufacturing city of Georgia, county seat of Richmond County. It is the second oldest city in the state, having been settled by colonists under General Oglethorpe; laid out under royal charter in 1735; rechartered in 1798, and incorporated as a city in 1817. During the Revolutionary War Augusta was captured and held for two years by the British, until June 5, 1781; after a siege of thirteen days it was surrendered to the Americans under General Henry Lee. The war of 1812 and the Indian wars left the recuperated and prosperous city unmolested, but during the Civil War it was twice threatened by General Sherman, and was garrisoned by the Confederates. Augusta is well built; its streets are straight and wide, and cross each other at right angles. The Medical College of Georgia, founded in 1830, is located here. The Richmond Academy is an incorporated institution, and there are numerous flourishing graded schools. Among the notable public buildings and institutions are the City Hall, the Odd Fellows' and Masonic halls, the Opera-House and the Augusta Orphan Asylum. An Independence and a Confederate monument are located here. The Augusta canal, 9 miles long and 150 feet wide, and fed by means of an immense stone dam across the Savannah river, furnishes an abundance of pure water for domestic use and for the numerous manufactories of the city. The streets of Augusta are broad and well paved, and there are many beautiful residences. Summerville, a near suburb, is one of the most popular winter resorts of the South. Augusta is an important commercial city. There are four railroads centering here, and 200,000 bales of cotton are received annually. There are 450 manufactures with about 6,000 employees. The annual output of the cotton factories is worth more than $4,000,000. Population 1890, 33,300. See Augusta, Vol. III, p. 73.

AUGUSTA, a town of Hancock County, western central Illinois, is on a railroad, 37 miles N.E. of Quincy, in a fertile stock-raising region. Coal and mineral paint are mined in the vicinity. Population 1890, 1,079.

AUGUSTA, a city and township of Butler County, southeastern Kansas, is on two railroads, and 150 miles S.W. of Topeka. It is in the midst of a rich wheat-growing region. Population 1890, 1,343; 1895, 1,597.

AUGUSTA, town of Bracken County, northeastern Kentucky, is 45 miles above Cincinnati, on the Ohio River. It is on the Chesapeake and Ohio railway. Tobacco is the chief export. Population 1890, 1,447.

AUGUSTA, a city of Maine, capital of the state, and county seat of Kennebec County, is situated at the head of tidal navigation, on both sides of the Kennebec River, which is spanned by an elegant bridge uniting the two parts of the city. There is an abundant supply of water, which is utilized by a fine system of water-works, and in the extensive manufacture of lumber and cotton goods. The statehouse, situated on an eminence at the southern limit of the city, is a handsome structure of whitish granite. A handsome Federal building was erected here in 1889. Augusta has a free city library, and is the repository of the Maine State Library. It is the seat of St. Catherine's School, for young ladies. Cotton goods, paper, wood pulp and lumber are manufactured. The Maine Central is the only railway passing through Augusta. Population 1890, 10,527. See AUGUSTA, Vol. III, p. 73.

AUGUSTA, capital of Perry County, southeastern Mississippi, is on the Leaf River, and 100 miles S.E. of Jackson. Hattiesburg, the nearest railway point, is 15 miles N.W. Population 1890, 1,204.

AUGUSTA, town of Eau Claire County, westcentral Wisconsin, is 20 miles by rail S.E. of Eau Claire, in a lumber and agricultural region. Population 1890, 1,187; 1895, 1,356.

AUGUSTANA COLLEGE AND THEOLOGICAL SEMINARY was incorporated in Chicago in 1860. In 1863 it removed to Paxton, and in 1875 to Rock Island, Illinois. It is an Evangelical Lutheran institution, and has theological, collegiate, preparatory, musical, commercial and normal departments. The faculty numbers 24, and there are about 500 students, and a library of 15,000 volumes. Since 1891 the Rev. O. Olsson has been president.

AUGUSTAN AGE. See AUGUSTUS, Vol. III, p. 79.

AUGUSTULUS, ROMULUS, was the last emperor of the western portion of the Roman empire. His name was Augustus, but the diminutive title under which he is universally known was given him by the Romans on account of his littleness of character. He was the son of Orestes, a Pannonian of birth and wealth who arose to high rank under the Emperor Julius Nepos. On the flight of the emperer, Orestes conferred the vacant throne on his son Augustulus, A.D. 476, retaining all substantial power in his own hands. Orestes, failing to conciliate the barbarians, who had helped him against Nepos, was beseiged by them in Pavia, captured and put to death. Augustulus was dismissed to a villa near Naples, with an annual pension of 6,000 pieces of gold. His after fate is unknown.

AUGUSTUS WILLIAM, PRINCE OF PRUSSIA, was born in Berlin, August 9, 1722; died at Oranienburg, June 12, 1758. He rendered distinguished service at the battle of Hohen-Friedberg in 1745, and as a general of infantry showed his ability at Lowositz in 1756. Frederick the Great was his elder brother, and his son became King Frederick William II.

AUK (*Alca*), a genus of web-footed birds, the type of the family *Alcidæ*, which was in great part included in the Linnæan genus *Alca*. See AUK, Vol. III, p. 85, 734, 735. See also GARE-FOWL, Vol. X, p. 78; RAZOR-BILL, Vol. XX, p. 302.

AUMALE, CLAUDE, DUC D', was the third son of Claude, the first duke of Guise, a brother of Francis, "*le grand Guise*" of the civil wars under the Medicean monarchs of France. See GUISE, Vol. XI, pp. 265–267. The first duke of Guise bestowed Mayenne upon his third son. The appanage of Aumale had been raised to a duchy in 1547 in favor of the duke's younger son, Francis of Loraine, who was killed at Pavia, and the dukedom came to Claude, who was born in 1526. He came into ascendency when his neice, Mary of Scotland, became queen of France. Aumale adhered to the intolerant Catholic policy of his brothers. He fought against the Huguenots at St. Denis, 1567, and two years later played the same part at Moncontour, but in March, 1573, he was killed at the seige of La Rochelle. He is charged with being one of the conspirators who planned the massacre of St. Bartholomew's day.

AUMALE, HENRI EUGÈNE PHILIPPE LOUIS D' ORLÉANS, DUC D', the fourth son of King Louis Philippe, was born in Paris, Jan. 16, 1822. He entered the army in 1839, and in 1847 succeeded Marshal Bugeaud as governor-general of Algeria. He resigned in 1848, and, joining his father, resided in England till the law was repealed banishing the Orleans princes from France. While in England he became known for his literary work. In 1871 he was elected a member of the national assembly, and returning to France, became an Academician. He was president of the court-martial which tried Marshal Bazaine. In 1885 the expulsion bill was passed, and the Duc d'Aumale was struck off the French army list by the minister of war, General Boulanger, and he withdrew from France. Soon after he left it was discovered that the Duc had given his château of Chantilly, with all the priceless treasures it contained, to the Institute, in trust for the French nation. He was banished in 1886, but the decree was revoked in March, 1889. The same month he was elected president of the French Academy. The University of Oxford in 1891 conferred on him the honorary title of D.C.L. His principal literary works are the *Military Institutions of France* (1867), denouncing the empire, and a *History of the Princes of Condé* (1869). Died May 6, 1897.



DUC D'AUMALE.

AUNE is the French cloth-measure corresponding to the English ell. The English ell, 1¼ yards=45 inches; the French *aune usuelle* (or *nouvelle*), 1¼ meters=47½ inches, English. It is now used only in Switzerland.

AUNOY, MARIE CATHERINE JUMELLE DE BERNEVILLE, COMTESSE D' (1650–1705), was a French authoress of the reign of Louis XIV. She composed fairy tales, romances and historical memoirs. Among her works are *The History of the Count of Warwick* and *Memoirs of the Court of England.*

AURANTIACEÆ, formerly regarded as a separate family of exogenous plants, but now usually reduced to a tribe under *Rutaceæ*, consisting of trees and shrubs, often of great beauty. The species of the genus *Citrus* are best known, among which are the orange, lemon, citron, etc.

AURELIANUS (AURELIAN), CLAUDIUS LUCIUS VALERIUS DOMITIUS, one of the most powerful of the Roman emperors. On the death of Claudius II (A.D. 270), Aurelianus was elected emperor by the army. He commenced his reign by vigorous opposition to the barbarian Alemanni, or Marcomanni, whom he expelled. His most famous enterprise was an expedition against Zenobia, whom he defeated and captured. From Tetricus he retook Gaul and received the appellation "Restorer of the Empire." He fell a victim to conspiracy, and was assassinated by his secretary, A.D. 276. See ROME, Vol. XX, p. 773.

AURELIUS VICTOR, SEXTUS, was a Roman historian of humble origin who lived under Constantius and his successors. Under Theodosius I he was prefect of Rome, having earlier been prefect of Pannonia Secunda by appointment of the Emperor Julian. It is probable that he was consul in A.D. 373. He wrote the lives of the Roman emperors, from Augustus to Constantius, in a work entitled *De Cæsaribus*, in 42 chapters. This work was first printed at Antwerp in 1579, and has been re-edited several times since. To this author have been attributed wrongly *Origo Gentis Romanæ; De Viris Illustribus Urbis* and an *Epitome* of his lives of the Cæsars, but brought down to Honorius.

AURELLE DE PALADINES, CLAUDE MICHEL LOUIS D', general, was born at Malzieu, Lozère, France, Jan. 9, 1804, and died at Versailles, Dec. 17, 1877. After having received a military training, he served with such distinction in Algeria, from 1841 to 1848, that in the Crimean war he was made a general of division. At the commencement of the Franco-Prussian war he was in command of the ninth military division. Having been made commander-in-chief of the army of the Loire, Oct. 14, 1870, he met the German forces under Von der Tann at Coulmiers on the 9th of November. In this encounter he was victorious, but was less successful in his effort to displace the left wing of the army of Prince Frederick Charles. That effort was made at Beaune-la-Rolande on the 28th of November, and four days later he was driven from Artenay by the Grand Duke of Mecklenburg. His continued retreat was criticised by Gambetta, and D'Aurelle promptly resigned. In the peace negotiations he was associated with Thiers, and was made commander of the division of Bordeaux. He was the author of *The First Army of the Loire*, published in 1872.

AUREUS OR DENARIUS AUREUS, a Roman gold coin, first coined 207 B.C. See NUMISMATICS, Vol. XVII, pp. 652, 654

AURICULA (*Primula Auricula*), a plant of the same genus as the primrose; much cultivated in flower gardens; has smooth, dark-green leaves, leafless stems, and calices covered with a mealy powder. A similar powder appears also on the flowers, which adds much to their beauty. This plant is a native of the Alps and other mountains in the south and middle of Europe. The name *Auricula* is derived from the Latin word *auris*, an ear, and is applied on account of the resemblance of the leaves to the ears of an animal. Sometimes called "bear's-ear." See HORTICULTURE, Vol. XII, p. 253; Vol. XIX, p. 737.

AURICULA, a genus (and *Auriculidæ*, a family) of gastropod *Mollusca*. They belong to the group of gastropods with aërial respiration (*Pulmonata*), and are hermaphrodite. Most of the species inhabit marshy lands near the seas in warm climates. They are often known as ear-shells.

AURICULAR CONFESSION. See CONFESSION, Vol. VI, pp. 257, 258.

AURIGA, a constellation containing Capella, a star of the first magnitude, which, during the winter, may be seen near the zenith. Auriga lies northward in the celestial sphere, and is called "The Wagoner."

AURINE OR AURIN. See CARBOLIC ACID, Vol. V, p. 86.

AURIOL, a town of southern France, is in the department of Bouches-du-Rhône and is 14 miles N.E. of Marseilles. Population, 4,804.

AURISPA, GIOVANNI, Italian scholar, was born in Sicily in 1369, and died at Ferrara in 1460. He brought from Constantinople to Italy, in 1423, manuscripts of classical Greek literature, including writings of Arrian, Strabo, Diodorus, Æschylus, Sophocles and Pindar. He was successful as an itinerant teacher.

AUROCHS. See BISON, Vol. III, p. 792, and in these Supplements.

AURORA. See GRACES, Vol. XI, p. 26.

AURORA, a manufacturing city, beautifully situated on the Fox River, in the fertile southeastern part of Kane County, northeastern Illinois. It has an extensive trade in the staple products of the surrounding country, and a variety of manufactures, including machinery, flour, woolen goods, silverware, carriages, sashes and blinds. It is an important railroad center, and contains the shops of the Chicago, Burlington and Quincy railroad, which employ nearly 2,000 men. Among the notable buildings are that of the Young Men's Christian Association, and a fine city hall, which cost $75,000. Aurora is the seat of Jennings Seminary, and its public schools are excellent. Chicago is 39

miles E. Population in 1890, 19,688, and rapidly increasing.

AURORA, a town of Dearborn County, southeastern Indiana, is on the Ohio River, and on the Ohio and Mississippi railroad. It is 25 miles S.W. of Cincinnati, Ohio, and carries on a large trade in grain and hay. Several mills and distilleries are located here. Population 1890, 3,929.

AURORA, a town of Lawrence County, southwestern Missouri, is on two railways and 35 miles S.W of Springfield. It lies in a good agricultural district, and lead and zinc are mined in the county. Population 1890, 3,482.

AURORA, a city and capital of Hamilton County, southeastern Nebraska, is on two railroads. Lincoln is 75 miles E. The surrounding country is fertile and well farmed. There are creameries and machine-shops here. Population 1890, 1,862.

AURORA, a village in Cayuga County, western New York, is the seat of Wells College for Young Women and Cayuga Lake Academy. It is located beautifully on the east shore of Cayuga Lake, 25 miles by rail N. of Ithaca. It is a popular summer resort. Population 1890, 555.

AURORA, an incorporated town in the northern division of York County, province of Ontario, 30 miles N. of Toronto, with which it has railway connections. It was formerly known as Machell's Corners; is in a hilly country, with natural water-power; has manufactures of lumber, farm-tools and leather, also a water-supply system and electric lights. Population 1891, 1,743.

AU SABLE, a city of Iosco County, on Lake Huron, Michigan, is on Saginaw Bay and 50 miles N.E. of Bay City. It is at the intersection of two railways, and has important lumbering and fishing interests. Population 1890, 4,328; 1894, 2,661.

AUS DER OHE, Adèle, pianist, was born in Hanover, Germany, 1862, and was taken to Berlin when a child. When three years of age she was able to repeat performances upon the piano after a single hearing. At 8 she began to appear in public concerts in Berlin, and from 13 until 20, studied under Franz Liszt at Weimar. During this time she traveled extensively in Europe, and was a favorite at the Imperial Palace in Berlin. In October, 1886, she appeared in the Seidl concerts in New York City, and upon her reappearance in 1889 was received with great favor in several cities of the United States. She has written poems and musical compositions.

AUSPICES. See Augurs, Vol. III, pp. 72, 73.

AUSSEE, a market town in the Salzkammergut of Styria, Austria, is situated at the confluence of three mountain streams which form the Traun, 22 miles S.E. of Ischl. It has mineral springs and baths, and is visited by some 6,000 strangers annually. The rock-salt mines here have been worked for many centuries. Population, 1,369.

AUSTEN, William, an Englishman of the fifteenth century, celebrated as a metal-worker and designer. He constructed the famous tomb of Richard de Beauchamp, Earl of Warwick, in St. Mary's Church, Warwickshire. See Sculpture, Vol. XXI, p. 559.

AUSTIN, a city and the capital of Mower County, southeastern Minnesota, is on Red Cedar River, and 101 miles by rail S. of St. Paul. There are railroad-shops here, and a number of manufactures. Flour, canned goods, machinery and plows are the chief productions. Population 1890, 3,901; 1895, 5,087.

AUSTIN, a city and the capital of Lander County, central Nevada, is a railway terminus, and 150 miles E. of Carson City. It is at the northern end of the Toyabe range, in which there are rich silver-mines. Population 1890, 1,215.

AUSTIN, a city of Texas, capital of the state, and county seat of Travis County, situated in the midst of beautiful scenery, at the head of high-water navigation, on the left bank of the Colorado River, which here breaks through a range of hills, upon which the city is built, and is spanned by



STATE CAPITOL BUILDING, AUSTIN.

two fine bridges. Austin became the capital of the republic of Texas in 1839, and capital of the state in 1850. The most prominent feature of the city is the new capitol, built of Texas marble, for the cost of which 3,000,000 acres of state land were appropriated, and which occupies a central position on Capitol Hill. From this the well-shaded principal avenues, 120 feet wide, radiate north, south, east and west, crossed by shaded streets, most of which are 80 feet in width. The original city limits on the east and west are bounded by avenues 200 feet in width. Austin is an important railroad city and the trade center of a fertile agricultural and grazing district, the staple products of which are cotton, corn, sweet potatoes, pork and cattle. It is the seat of the State University, Texas Military Institute, a Roman Catholic academy, and asylums for the blind, the insane and the deaf. The population in 1890 was 15,700, but the annexation of some suburbs has since given to it a considerable increase.

AUSTIN, Alfred, English poet-laureate, was born at Headingly, near Leeds, England, May 30, 1835. He was educated at Stonyhurst and St. Mary's College, Oscott; graduated at the University of London in 1853; and was called to the bar in 1857. He became interested in literature, and soon devoted himself entirely to that pursuit. His first important book was *The Season, a Satire* (1861),

which was criticised severely. *The Human Tragedy* (1862) was recalled soon, and was not issued in altered form until 1876. Among later volumes of verse are *Savonarola*, a tragedy (1881), *Soliloquies in Song* (1882), and *At the Gates of the Convent* (1885). As a journalist, Austin was long connected with the London press, serving since 1883 as editor of the *National Review*. In 1891 he issued *Narrative Poems*. Among his later poems, *The Garden That I Love* and *In Veronica's Garden* have met with most favor. Among the New Year appointments of 1896 was his to the poet-laureateship. As Lord Tennyson's successor to this honor, the appointment of Mr. Austin aroused considerable interest and criticism. His *England's Darling*, written after his appointment, was published widely.



ALFRED AUSTIN.

AUSTIN, JANE GOODWIN (1831–94), an American authoress; born Feb. 25, 1831, in Worcester, Massachusetts; daughter of Isaac Goodwin; in her twentieth year married L. H. Austin of Cambridge, where, and in Concord and Boston, she successively passed her married life; died March 30, 1894, in the latter city; noted for her books of colonial tales concerning the careers of the Mayflower Pilgrims and their descendants, of which she published about a score. Among the best known of them are *Dora Darling* (1864), the story of a *vivandière; Standish of Standish; Betty Alden; A Nameless Nobleman; Dr. Le Baron and His Daughters; The Desmond Hundred; Nantucket Scraps;* and her last publication, *David Alden's Daughter* (1892). Some of her stories form a chronological series concerning Plymouth folk, and she left some incomplete manuscripts.

AUSTIN, MOSES, a Texan pioneer; born in Durham, Connecticut, in 1774. He went to the West in 1798, and engaged in lead-mining. In 1820 he removed to Texas and petitioned the Mexican commandant at Monterey for permission to colonize 300 families in that section. The hardships he encountered while in search of emigrants caused his death, in Louisiana, June 10, 1821. The colony, however, was established successfully by his son, for whom the state capital was named.

AUSTIN, STEPHEN F., a Texan pioneer, son of preceding, was born about 1790. He founded the present city of Austin, Texas, after obtaining a confirmation of the grant, obtained by his father from the Mexican authorities in 1820, for the colonization of 300 families. In 1833 the American settlers had become powerful, and were restless under Mexican rule, and Austin was imprisoned for several months. On his liberation in 1835 he took part with the revolutionists. He became commander-in-chief, and in November was sent on a commission to the United States to secure recognition from the government at Washington. In this capacity he acted with prudence, and would have been successful had he been properly provided with credentials. He returned to prosecute his work, but died, Dec. 27, 1836.

AUSTRALASIAN FEDERATION has been much considered in the Australian colonies for several years. In 1885 a Federal Council Act was formulated for the purpose of dealing with matters of common interest, but the federal union was effected only partially. A council was instituted and sessions were held in 1886, 1888 and 1889, but the colonies of New South Wales and New Zealand had not thus far sent a representative. The council did not meet in 1890, but, instead, a conference of representatives of the Australasian colonies met in Melbourne, Feb. 6, 1890, for the purpose of considering a scheme of Australasian federation and federal defense. The colonies represented were Victoria, New South Wales, South Australia, Queensland, New Zealand, Tasmania, and Western Australia. A resolution was adopted, declaring that the time had come for the union of the Australasian colonies under one government. Provision was made for the admission into the union of the more remote Australasian colonies, at such times and under such conditions as might thereafter be agreed upon. The conference sat till February 14th, and before adjourning, adopted an address to her Majesty the Queen of England, embodying the resolutions passed, one of which provided for holding a national Australasian convention early in 1891, to be composed of delegates appointed by the legislatures of the various Australasian colonies. This convention assembled, March 2, 1891, at Sydney, and passed several weeks in deliberation. The result was to formulate a constitution for the proposed commonwealth of Australia, the same to be submitted for adoption to the Imperial Parliament, and meanwhile to be urged on the legislatures of the several colonies as a project for ratification. Its adoption in England is still doubtful, but it continues to grow in favor throughout the colonies.

At Hobart, in January and February, 1895, a conference of the premiers of the Australian colonies was held. Here were passed resolutions which urged the importance of federation, and required that a convention of representatives chosen by the electors of each colony should draft a constitution to be submitted to the electors later. The acceptance of such a constitution was to be followed by an effort to secure its legislative enactment.

AUSTRALIAN ALPS. See VICTORIA, Vol. XXIV, p. 215.

AUSTRALIAN BALLOT SYSTEM. See BALLOT, in these Supplements.

AUSTRASIA, an ancient kingdom of the Franks. See FRANCE, Vol. IX, p. 530.

AUSTRIA, ARCHDUCHY OF, the origin of the empire of Austria. See AUSTRIA, Vol. III, pp. 123, 124; also ALBERT I, Vol. I, p. 450.

AUSTRIA-HUNGARY. For general history and description see Vol. III, pp. 115–143, and

HUNGARY, Vol. XII, pp. 361–380. Area, 240,942 square miles, exclusive of Bosnia and Herzegovina, which have an area of 23,262 square miles. Population, Dec. 31, 1890, 41,358,886; in 1895 the population of the two Balkan protectorates was 1,568,092. Capital of the empire, Vienna. Reigning emperor, Francis Joseph I, emperor of Austria and king of Bohemia, etc., and apostolic king of Hungary.

Austria proper, 115,903 square miles; population, 23,895, 413; Hungary, 125,039 square miles; population 1890, 17,463,473; the latest official statistics being for the first of 1891. The recognized religions are the Roman Catholic (78 per cent), Evangelical Brotherhood (9 per cent), Greek Oriental (7.5 per cent), Jews (4.5 per cent), Armenian Oriental and Old Catholics, the latter forming an inappreciable percentage of the population.

The ethnical elements of the population, on the basis of language, are thus given in latest returns:

| | Austria. | Hungary. |
|---|---|---|
| German | 8,461,580 | 2,107,177 |
| Bohemian, Moravian and Slovak | 5,472,871 | 1,910,279 |
| Polish | 3,719,232 | ------- |
| Ruthenian | 3,105,221 | 383,392 |
| Slavene | 1,176,672 | 94,679 |
| Servian and Croatian | 644,926 | 2,604,260 |
| Latin | 675,305 | ------- |
| Rumanian | 209,110 | 2,591,905 |
| Magyar | 8,139 | 7,426,730 |
| Gipsies | ------- | 82,256 |
| Others | ------- | 94,679 |

Following were the populations of the principal towns of the empire in January, 1891: Vienna, 1,364,548; Prague, 184,109; Trieste, 158,344; Lemberg, 128,419; Gratz, 113,540; Budapest, 506,384. The last-named city is the capital of Hungary, which has no other city reaching to 100,000 in population.

The system of defense is, in Austria and Hungary alike, founded on the principle of universal military service, and was put in its present form by statutes of 1889. The armed force comprises the army, navy, landwehr and landsturm, besides a reserve, called the ersatz, supplemental to both army and landwehr. Military service begins at the age of 21 and continues,—(1) in the army, three years in the line and seven years in the reserve; (2) in the navy, four years in the marines, five years in the reserve and three years in the seewehr; (3) in the landwehr, twelve years for those at once enrolled, and two years for those transferred to the army landwehr. Then follow ten years in the landsturm. The yearly contingent of recruits for the army amounts to 103,100, of which about two fifths is the proportion drawn from Hungary. The actual strength of the three services, on a peace footing, is as follows: Army, 313,613; landwehr, 40,639; total, 354,252; and on a war footing: Army, 1,872,178; while the number of men who could be obliged to serve in the landsturm is over 4,000,000. In peace the number of guns, exclusive of fortress artillery, is 912; in war, 1,864. In peace there are 63,323 horses; in war, 281,886. The Austrian navy consists of a total of 129 vessels (including 11 armored battle-ships and 57 torpedo-boats), of 411 guns, 366 machine-guns, 158,300 horse-power, and officers and crews, 8,740.

Upward of 4,710,000 persons, or 21.3 per cent, of the Austrian population, are now employed in manufactures. The glass industry is of great importance in Bohemia, there being 5,423 works of various kinds, with 29,168 work-people. In the woolen industry, 2,000 industrial establishments are engaged, beside 707 spinning and weaving factories, with 58,500 work-people. The cotton industry occupies 1,900 works, of which 633 are on a large scale, with 96,000 workers, about 2,350,000 spindles and 42,000 power-looms. There are 1,962 beer breweries, producing 294,000,000 gallons of beer, and numerous distilleries, mainly for brandy, both these products being extensively exported.

In 1894 the total imports amounted to 700,000,000 and the total exports to 795,500,000 florins.

The public debt in 1895 was $2,947,079,160, of which $596,215,080 was special to Austria, $1,009,562,940 special to Hungary, and $1,341,301,400 the common debt of both. The value of gold, silver and bullion exported in 1894 was 27,361,456 florins, and the imports 37,639,940 florins.

The length of railways in the empire in 1895 was: Austria, 10,100 miles; Hungary, 8,217 miles; total, 18,317 miles.

By law of Aug. 2, 1892, the monetary system of Austria-Hungary was reformed on a gold basis, though the krone, the standard coin, is not coined in that metal. It contains 4.175 grams of fine silver and is equivalent to a franc. One hundred heller make one krone, or crown, and hellers are coined in bronze and nickel. The new coinage is upon a decimal basis, and silver is not generally receivable in one payment for more than 50 crowns, or about $10, although there is no limitation on their legal tender.

HISTORY. For the preservation of the peace of Europe after the Franco-Prussian war, a league of the emperors of Germany, Austria-Hungary and Russia, known as the Dreikaiserbund, was formed under the influence of Bismarck. It was followed in 1879 by an Austrian and German alliance, on account of the resentment felt in Russia to the results of the Berlin congress of the preceding year. To this alliance Italy was admitted in 1888, and the compact became known as the Dreibund. It provided chiefly that all three powers would unite to resist any attack upon either of the allies, but was defensive rather than offensive. The Dreibund gave security to the peace of Europe, although it was opposed, in 1893, by the alliance of France and Russia. When the Armenian massacres occurred in 1895, Austria joined the great powers in remonstrances to the Sublime Porte, and went so far as to propose that Lord Salisbury should make a demonstration before Constantinople with a British fleet, but subsequently receded, for fear of arousing Russian intervention in the East. In 1896, Austria voted in favor of taking $2,500,000 from the reserves of

the Egyptian treasury to support the operations of a British expedition against the dervishes in the Sudanese Nile valley.

In internal affairs the difficulties of administration, growing out of the small groups of race-parties in the Reichsrath, were not overcome by the new constitution of 1867. They were rather augmented when the Slavic principalities of Bosnia and Herzegovina were handed over by the congress of Berlin for Austrian occupation in 1878, and the trouble of obtaining a parliamentary combination strong enough to carry on the government led to frequent changes of the ministry. Under Count Taaffe's balancing ministry, the Young Czech party grew strong in Bohemia, demanding a reorganization of their country, in order to restrict German influence there, and a coronation, at Prague, of Francis Joseph as their king. He refused, in 1890, to accede to this request, but the Bohemian discontent continued active. The Taaffe ministry fell in 1893, after a duration of 14 years, before the combined opposition of the German Liberals, the Conservatives and the Poles, to his scheme for doubling the suffrage privileges of the empire. To his successor, Prince von Windischgrätz, he also left the complications of a contest with the Clericals over the question of civil marriages in Hungary. In June, 1894, after much contention with the house of magnates in the Hungarian Parliament, a law was enacted making marriage and divorce uniform in the kingdom, and also civil functions free from ecclesiastical control. The same year a commercial treaty was entered into with Russia, and was thought to have some bearing on the Dreibund, as weakening its vigor. In September, 1895, Windischgrätz was succeeded by Count Casimir Badeni as president of the Austrian cabinet. Six months before, Count Kalnoky resigned the ministry of foreign affairs and of the imperial House for the whole monarchy, which he had held since 1881, a result of friction with the Vatican and the recall of the Roman nuncio. This weakened the Clerical party in Hungary, and ecclesiastical bills recognizing Jewish worship and enlarging freedom of worship became laws in June, 1895. In Austria proper the German Liberals lost their ascendency, through the growth of the Social Democrats and the Anti-Semites. The latter obtained control of the Council of Vienna, and persisted in electing and re-electing Dr. Lüger burgomaster, notwithstanding the opposition of Count Badeni and the Emperor. After a year of contest, Lüger withdrew in May, 1896, at the personal request of the Emperor; but the strength of his position was augmented by the belief of the Austrian Germans that the Anti-Semites were arrayed against the preponderating influence of Hungary in imperial affairs, as well as against Jewish financial oppression. Their Lüger programme also included an inhibition of Protestant teaching in the public schools.

By the treaty of Berlin (July 13, 1878), the Ottoman provinces of Bosnia and Herzegovina were handed over to the Austro-Hungarian government for military occupation and administration. The direction of the administration of the two occupied provinces is exercised by the Bosnian bureau, intrusted to the imperial finance minister in Vienna, in the name of the Emperor-King. The principal authority in the province itself, with its seat in Sarajevo, is the provincial government in three departments—for internal affairs, finance and justice.

AUTEUIL, formerly a village at the entrance of the Bois de Boulogne, is now inclosed within the fortifications of Paris. It is noted as the residence of famous literary men, such as Boileau and Molière, and of the gifted widow of Helvetius at the close of the last century.

AUTHORITIES, as a legal term, mean such enactments of law, opinions of courts of justice and opinions of recognized text-writers as declare the rules of law which are applicable to the case under consideration. The constitution, statutes and municipal ordinances are absolute authority, except where they conflict with each other, in which case the constitution governs. The opinions of courts of justice, which declare the law in cases where the principles involved are alike or similar, are binding authorities, except where they conflict with the constitution or statutes. Opinions of recognized text-writers are valuable as authorities, chiefly when no other authority on the question can be found. In such cases their value depends upon the approval with which the reasons assigned meet in the mind of the reader or of the court.

AUTHORITY is the power delegated by one person to another, authorizing him to do certain acts. Authority coupled with an interest is where the power is delegated for a valuable consideration. Authority may be general, special or limited. Authority may be delegated by deed for any lawful purpose, but it is not generally necessary that the authority be by deed. Oral authority is sufficient for most purposes. Authority, unless coupled with interest, may be revoked at any time.

AUTHORS' SOCIETIES. Having for its model the French *Société des Gens de Lettres*, which has been in existence for upward of fifty years, and has for its objects the protection of interests in literary property, the English Incorporated Society of Authors was established in 1884 by the late Sir Frederick Pollock, Sir Walter Besant and several noted literary men. Its principal *raison d'être*, the establishment of international copyright, having been successfully accomplished, the society turned its attention to a revision of domestic copyright law. Several useful works have been published by the society, bearing on various phases in the relations between authors and publishers, and excellent work has been accomplished in cases of colonial literary piracy. An affiliated agency, termed the Authors' Syndicate, attends to the business arrangements of members desiring to publish. In the United States, THE AMERICAN AUTHORS' GUILD exercises somewhat similar functions. Organized as The

Association of American Authors in May, 1892, and incorporated under its present name in 1894, the guild, under the presidency of James Grant Wilson, has a membership of over 200, and has been of much utility in informing authors of their legal rights and securing the observance of such rights.

AUTOGRAVURE, a peculiar process of photo-engraving, patented by a London engraver in 1884. If an ordinary autotype carbon print be placed on silvered copper instead of on paper, the slight relief which the picture possesses is enough to admit of an electrotype being taken from it. The raised part of the print becomes the depressed part in the electrotype, and impressions can therefore be taken from the latter in the same way as from an engraved copper plate.

AUTOHARP, a musical instrument having a board or tension-frame shaped like the body of a grand piano, but very much smaller in size, and bearing 21 to 36 strings, which are plucked with the fingers. It has a piano scale, and three to six cross-bar padded mutes. When any of these cross-bars are pressed, and the hand is run over the strings, a complete chord is the result; hence the name, which is a contraction of automatic harp. The system of finger-notation is exceedingly simple, complex chords being represented by a single figure.

*AUTOMOBILE VEHICLES AND MOTOR-CARRIAGES. Automobile vehicles may be divided into three classes: heavy omnibuses or cars, for road-use in carrying passengers or goods; pleasure-carriages, for use in driving on the streets or roads, in place of the ordinary horse and buggy, cab, etc.; bicycles, tricycles or quadricycles, furnished with a motor, to relieve the rider of the work of operating the pedals, and to increase speed.

Steam road-vehicles of a heavy type were the first form developed. These were built in England early in the sixties, and their construction has been a regular business with several firms ever since. In 1893 they were used in the British army, in the Berkshire maneuvers, to draw the field-pieces, and were pronounced a success, with the result that they are being introduced in the artillery companies to a considerable extent. They are also used by the Italian army, and by the Swiss government in the military service. In the Russian army their use is increasing constantly, and other governments are investigating their merits. The makers claim a saving of about 40 per cent over the cost of using horses, but, of course, this varies with the conditions. They are regarded with favor in many of the English colonies, and John Fowler and Company, of Leeds, England, sent one to Australia for use in a section where roads were so few that most trips were made across country, and this road-engine was actually driven across a small river. Another of Fowler's road-engines is in use, drawing the wagons of a country circus about England, hauling five vans in the daytime and running a dynamo at night to light the tent. The Cliff Hill Granite Company, of Leicestershire, ran two road-locomotives between their quarries and the railway, a distance of several miles, carrying 14 to 16 tons at a trip.

From 1893 to 1896 a number of road traction-engines were built, both in France and in England, to draw trailers, or short trains of cars, over ordinary roads, carrying passengers and baggage, and aiming to do the business of a trolley electric railway or steam-railroad without undertaking the expense of maintaining tracks. These road-engines are operated by steam, and some of them make 12 miles an hour on good roads. Charles Burrell and Son, of Thetford, England, sent one outfit to Greece. It included a locomotive and omnibus capable of carrying 40 passengers at a trip.

The Le Blant steam road-omnibuses have attracted much attention in France, and one of them was run in the competition of automobile vehicles at Paris in 1894, receiving third prize. Three of these were built before they were considered at all satisfactory. The one that took the prize weighed 9,500 pounds, including passengers, and had a car-weight of 950 pounds per passenger. Wooden wheels were used, though the makers now use wheels of iron and steel. The engine was a three-cylinder affair, arranged to generate steam at a moment's notice, and developing about seven horse-power. It made the trip from Paris to Rouen and return, about 80 miles, in 12 hours and 50 minutes, using 8 to 10 pounds of coal and 30 pounds of water per mile. The maker claims that it can be run at a cost of less than one cent a mile per passenger. A few delivery-wagons built on this plan are in use in Paris, the boilers being made non-explosive, so as to be run by inexperienced persons. They weigh about two tons, and are capable of as great a speed as 11 miles an hour. Le Blant also builds a motor-car, drawing a trailer, and has established omnibus routes for suburban communication in the departments of Tarne and Martinique.

The Peugeot automobile carriages are among the best known in France, one of them having been awarded first prize at the competition in 1895 arranged by James Gordon Bennett and Baron Zuylon de Nyevelt, being the first four-passenger vehicle to cover the 736 miles stipulated, the time being 54½ hours, including stoppages. The firm of Les Fils de Peugeot Frères are bicycle manufacturers, and their vehicles are built on the same lines which have made a success of that vehicle. In 1891 they produced a four-wheeled vehicle with gasoline motor that worked well, and subsequent vehicles have been improvements on that design. The first long journey with one of these vehicles was a trip of 1,280 miles, covered in the actual running-time of 139 hours,—an average of 9.2 miles an hour. The carriage weighed 1,170 pounds, with tools and 60 pounds of benzine,—a store sufficient for 160 miles of travel. The frame is built of weldless steel tubes, and the mechanism suspended on springs,

*Copyright, 1896, by The Werner Company.

so as not to be injured by the concussions of the road. A differential speed-motion is provided, so that by throwing certain gears in and out the speed can be increased or reduced at pleasure. The motor is 2½ to 3¼ horse-power for a four-passenger vehicle, or 1½ to 2½ horse-power for a two-passenger carriage. It will turn around within a circle of 10 feet, and there are hand-levers for steering, operating the brake, regulating the speed and reversing, and a pedal for disconnecting the motor. The tubes used in the frame-work are of drawn steel, 1½ to 2 inches in diameter. By an ingenious arrangement these tubes are made to contain water for cooling the motor, which tends to heat rapidly. A small centrifugal pump is used to keep the water circulating, and eight gallons of water are found sufficient for the cooling. The tubes are enameled inside with a hard varnish to prevent rusting. The mechanism is hung from the axles by plate-springs, and the carriage and mechanism are so suspended from central pivots on the fore and rear axles that they remain practically horizontal, regardless of ordinary twisting or falling of the wheels in ruts or depressions of the road. Tension spokes are used in the wheels, which are of bicycle-pattern slightly modified, and vulcanized rubber tires surround the rims. Pneumatic tires were tried, with a gain of five per cent in speed, but the weight of the vehicle made them so liable to puncture that their use was abandoned. Ball-bearings are used throughout, and sprockets and chains to connect the shafts and axles, and also the steering-wheel with the fore axle.

The Daimler gasoline-motor furnishes the power, and is used by other makers of automobile carriages, being regarded as one of the lightest motors in use. This motor utilizes the explosive force of a mixture of gasoline and air to drive pistons in the cylinders. The gasoline is vaporized by a current of air, and projected to a series of platinum points kept incandescent by burners, usually of the Bunsen type. The quantity of gasoline is absolutely regulable, so that the explosion cannot exceed a certain force, and there is no danger from that source. The motor is thrown into connection with the axles by means of a friction-clutch, which, in case of accident, will slip under strains that might otherwise break the mechanism. Toothed gearing is used on the shafts, belts having proved unsatisfactory. The gearing is designed to give a speed of 4 miles an hour on 10-per-cent grades, and 12 to 14 miles an hour on the level, but there are four graduated speeds which may be used. In starting, the burners are lit, and a hand-crank is rotated to start the motor to exploding, the regulating lever is set at the lowest speed, the clutch mechanism is thrown on by means of a pedal, and the carriage moves. As soon as headway is made, if the road be level the second, third and fourth speeds may be applied. With the slower speeds there is much more power developed, so that these have to be used in hill-climbing. By reversing the engine, the carriage can be run backward as readily as forward. A vehicle for two, built on this plan, weighs about 850 pounds, and a carriage for four about 1,350 pounds. The selling-price of the latter is 5,600 francs. The Peugeots also build omnibuses of the same character, as well as intermediate sizes of vehicles.

The Panhard and Levassor petroleum carriage made the fastest time at the French competition in 1895, as well as the best official time for an automobile carriage up to date. The run of 736 miles was covered in 48 hours and 53 minutes, including stoppages, being a speed of a little over 15 miles an hour. The first prize was not won by this achievement, however, because this carriage seated but two persons, and the rules reserved the first prize for a four-passenger vehicle. A gasoline-motor furnishes the power, and enough gasoline may be carried in the reservoir for a journey of 50 miles, while the cooling-water requires renewal every 30 miles of travel. Iron-tired wooden wheels are used, and the vehicles are sold for 5,000 francs.

M. Jeantaud, a Parisian, who has been experimenting with automobile carriages since 1877, produced an electric carriage in 1895, operated by storage-battery accumulators, which makes 12 miles an hour on a level road. He uses Fulmen accumulators, and has succeeded in reducing the weight of the batteries somewhat, so that a two-passenger vehicle weighs 2,500 pounds. About three horse-power is used.

Storage-battery carriages are used also in London for express and parcel-delivery, and an electric-power station was erected in 1895–96 for the special purpose of charging the batteries for these vehicles.

The building of automobile vehicles in the United States has not been marked by the same success that has crowned European efforts. There are several on the market, for which great claims are made, but the results of public trials have been unsatisfactory. At a trial in Chicago, Nov. 28, 1895, the best speed was seven miles an hour. The weather conditions were about as bad as could be, there being six inches of slush on the roadway. The Duryea gasoline motor-carriage, which was the winner, is constructed much like the Peugeot carriage described. It is said to have made 16 miles in an hour at a private test on the road. The Morris and Salom motor-carriage took a medal for general excellence, though it did not finish the course. The steering is accomplished by a parallel movement of the rear wheels. Its power comes from a storage-battery of 48 accumulators of 50 ampere-hours each, giving a total battery of about five horse-power. Two Lundel motors, with a total of three nominal horse-power, are used. The weight of the battery is 664 pounds, and of the carriage nearly 1,000 more. It will not run more than 20 or 25 miles under favorable conditions without recharging, however; which is the great drawback, with the storage-battery as a motor for such vehicles. The Mueller, Rogers and De la Vergne carriages, which also entered the Chicago race,

were unable to display their good points to advantage, the Mueller being the only one to complete the 54 miles, and displaying a speed of only 5½ miles an hour.

The Sturges motor-wagon, which is of the electric type, drew a prize at the Chicago run. It has the general appearance of a road-wagon, weighs 2,750 pounds, and carries 36 accumulators, with a three-horse motor, the power being transmitted to the axle by single reduction-gears. Under ordinary conditions it should run about fifty miles before the batteries require recharging.

The steam automobile carriage of A. C. Ames, of Chicago, is the lightest steam-vehicle suitable for carrying two persons that has yet been exhibited. It has ordinary bicycle-wheels, and weighs but 400 pounds. Gasoline is burned as fuel. The engine is of the oscillating type, and the cylinders are tubes of 1¾-inch diameter and 13-inch stroke. The arrangements for forced draft, and for quick heating of the water, are most ingenious. When the carriage stops, the rise in the steam-pressure is used to turn down the burners, so that it falls again, and thus is regulated automatically.

The lightest automobile carriage of any sort exhibited at Chicago was the gasoline carriage of Max Hertel, which weighed only 220 pounds. It carried two persons, and received a prize for a device of starting the motor from the driver's seat.

The De la Vergne motor-drag, as exhibited at Chicago, carried six persons, and weighed 1,800 pounds. The manufacturers also build a four-passenger vehicle. Two Benz gasoline-motors are used, the cylinders being balanced so that the pistons work oppositely, reducing the vibration to a marked degree. The tank is large enough to hold a supply of gasoline sufficient for a three days' run. The noise of the exhaust is muffled. The wheels are rubber-tired. Sprockets and chains are used to convey the power to the wheels. The wagon can be reversed without stopping the engine.

The Racine, Wisconsin, motor-carriage has not been tried in any public race; but as it makes use of a form of engine that is credited with driving a bicycle a straightaway mile in 58 seconds, great speed is expected. The motor is known as the Kane-Pennington engine, and utilizes kerosene, the explosion being caused by a two-spark mechanism, which is claimed to utilize most of the heat wasted in other engines.

Other makers are putting machines on the market in America. One is the Benton Harbor motor-carriage, for four persons. This has rubber tires and a seven horse-power motor, which the makers term a hydrocarbon-engine. Rawhide is introduced into the gears to lessen the noise, and the mechanism is all inclosed under the body of the carriage. There are only 10 bearings in the entire carriage, and all of them are ball-bearings. The frame-work and wheels are of the ordinary bicycle construction. One handle is manipulated to produce all the operations of starting, stopping, reversal or variation of speed. The weight is 1,050 pounds. The makers have experimented with it for a period of 10 years, trying first steam, then the storage battery, and finally the hydrocarbon engine.

The Hitchcock Manufacturing Company, of Cortland, New York, placed a quadricycle and a bicycle on the market in 1895, both of which were operated by miniature gasoline-motors. The quadricycle developed five horse-power, though weighing only 150 pounds; but the four-inch pneumatic tires have proved to be easily punctured, and some improvement in them is necessary. It is claimed that a gallon of naphtha will drive this vehicle 50 miles. The Hitchcock motor-bicycle, which weighs only 60 pounds, has a little naphtha-tank on top of the frame, between the saddle and the handles. It feeds, drop by drop, down through the hollow tubes of the frame, to the cylinders, one on each side of the rear wheel. The drops of naphtha are exploded by an electric spark, giving impulse to the pistons. A little battery is hung to the frame, and furnishes energy for the electric spark. The speed is regulated by the amount of oil let down, this being controlled by a thumb-trigger on the handle-bar. There are pedals for use in starting the bicycle, and the rotation of the wheels, together with the turning of a switch, sets the motor to working. The exhaust from the cylinders can be switched into the handle-bars, to warm the rider in cold weather.

Carriages driven by chloride accumulators have been built in Kansas City by Dr. H. C. Barker and J. R. Elbing, and in Boston by the Holtzer-Cabot Electric Company, but all of them are heavy, and cannot make long runs without recharging of the batteries.

A successful motor-bicycle has been built in Germany and introduced into France. Messrs. Wolfmuller and Geisenhof are the inventors. It is run by a 2½ horse-power gasoline-motor, and the rear wheel is a solid, comparatively heavy disk, so made to prevent its racing or running away, should it slip on wet ground. The ordinary light wheel would be liable to cause dangerous racing of the motor if it slipped. The frame of the bicycle is bent down, as in a woman's safety bicycle, and between the double tubes are located the motor-cylinders, the evaporator and the water-reservoir. The whole machine weighs 110 pounds, and its speed is varied by the touch of a button. It is claimed that 23 miles have been made in an hour, on a good road, with this bicycle. Cooling-water for the cylinder is circulated through the frame. A small lamp is used to explode the gasoline mixture.

Another United States invention is a motor-tricycle devised by H. P. Maxim. It consists of two large wheels, side by side, with tandem seats for two. A small steering-wheel is in front, and between this steering-wheel and the main axle the motor is hung, close to the ground. It is a three-cylinder engine, cold-drawn steel tubes $\frac{1}{16}$ of an inch thick being used for the cylinders. A spark-battery is located under the saddle. The gaso-

line tank and motor weigh 32 pounds, and the whole machine, 100.

The use of automobile vehicles is largely dependent upon good roads. Of the various forms of power, steam appears to be most preferred for heavy vehicles, while the gasoline-motor is undoubtedly the best for light carriages. The storage-battery as a motive power is handicapped by the necessity of frequent charging, which can be made only from some electric-power station. Light carriages of the gasoline type, for either pleasure or delivery of goods, are now on sale in most of the larger cities of the world, and the tendency to use them is on the increase.

C. H. COCHRANE.

AUTONOMY, the management of the government by the citizens of a state; applied especially to the political conditions of ancient Greece, where nearly every city was an independent state, and the general welfare of the whole country often was sacrificed to the individual ambition of a single city. In modern usage it means the right of self-government within a particular area, as a city, a province or a state.

AUTOPLASTY, a mode of surgical treatment which consists in replacing a diseased or defective part by means of healthy tissue from other parts of the same body. The most familiar instance is the Rhinoplastic or Taliacotian operation for supplying a new nose from the skin of the forehead. The operation for the lips is called chiloplasty.

AUTOTYPE. A sheet of paper coated with a film of bichromatized gelatin, in which lampblack or other permanent pigment has been held in solution or suspension, is exposed to the action of light in a printing-frame, beneath an ordinary photograph negative. In proportion as the light is admitted to the gelatin film or "tissue" through the negative, it becomes hardened and insoluble in water. The print afterward is treated by washing away the unaltered portions of the film, and the result is a permanent print of the object photographed. The autotype process is adapted admirably for the reproduction of oil paintings, and has been employed successfully for the reproduction of drawings; but where the work to be copied has a perfectly dead surface, the slight gloss possessed by the autotype print is a disadvantage. This objection is still greater in the reproduction of engravings and etchings; and for these the heliogravure process of Mr. Amand Durand, of Paris, is preferred.

AUTRAIN, capital of Alger County, on Lake Superior, northern peninsula of Michigan, is 30 miles by rail E. of Marquette. The "Pictured Rocks," on the south coast of Lake Superior, are 18 miles E. of here. Fishing is the chief industry. Population 1895, 280.

AUTREFOIS CONVICT, a plea in court to the effect that the defendant has at another time or place been convicted of the charge on which proceedings are being taken. It usually operates as a bar to further prosecution. If the defendant's plea is acquittal on a previous trial, it is called *autrefois acquit*. In the Bill of Rights incorporated into the amendments of the United States constitution it is enacted specifically, "nor shall any person be subject for the same offense to be twice put in jeopardy of life or limb," and in American jurisprudence either of the above pleas is a sufficient answer to any information or indictment, but neither is applicable to proceedings in continuation of a former action or on appeal. In other words, the "jeopardy" is not complete until a verdict has been rendered.

AUTUMN, the third season of the year, between summer and winter. Astronomically, in the northern hemisphere, it begins at the autumnal equinox, when the sun enters Libra, about September 22d, and ends at the winter solstice, when the sun enters Capricorn, about December 21st; but popularly in the United States it comprises the months of September, October, and November. In Great Britain it comprises August, September, and October; while, according to Littré, it extends in France from the end of August to the first fortnight of November. In the southern hemisphere it corresponds in time to the northern spring.

AUWERS, ARTHUR, astronomer, was born at Göttingen, Germany, Sept. 12, 1838, and has been since 1866 astronomer of the Royal Prussian Academy of Sciences. He has received the gold medal at the Royal Astronomical Society, and the Watson medal from the National Academy of Sciences at Washington, District of Columbia. His chief work is a four-volume publication on German observations of the transit of Venus. He has edited three volumes of the re-reduction of Bradley's *Observations*, and determined the variable motions of Sirius, Procyon and their invisible neighbors.

AUXANOMETER, an instrument for measuring the rate and indicating the varying periods in the growth of plants. There are several different forms of the instrument. The one in most common use consists of a small wheel over which passes a thread weighted at one end, and attached to the growing tip of a plant at the other; a much larger wheel rotates on the same axis as the small wheel, and over it is passed another thread bearing at one end a needle, and so weighted at the other that an exact counterpoise is obtained. The needle point is in contact with a smoked cylinder, which is rotated slightly by clock-work at whatever intervals may be desired. Growth of the plant causes rotation of both wheels, and the record thus made on the cylinder is in known proportion to the actual growth of the plant.

AUZOUX, THÉODORE LOUIS, physician and medical writer, was born at St. Aubin d' Escroville, Eure, France, in 1797, and died in Paris, May, 7, 1880. He invented *anatomie classique*, a papier-maché way of making models of anatomical preparations. His writings include *Treatise upon Cholera Morbus; Elementary Lessons in Anatomy and Physiology;* and two works on the horse.

AVA, ARVA, YAVA, KAVA OR KAWA (*Piper methysticum*), a plant of the family *Piperaceæ*, having narcotic properties. It is found in many of

the South Sea Islands, where the people intoxicate themselves with a liquor produced from its root. A tincture of it is used beneficially in chronic rheumatism. The intoxicating liquor is prepared by macerating it in water.

AVALANCHES, masses of snow or ice that roll down the sides of high mountains. They have different names, according to their nature. Drift or powder avalanches (*Staub Lavinen*) consist of loose, dry snow, which, once set in motion by the wind, accumulates in its descent and finally comes into the valleys in overwhelming clouds of dustlike snow. Another kind of avalanche resembles a landslide. In the spring, when the snow begins to melt, the sod underneath becomes detached and the snow and sod go down the mountain, carrying all before them. The greatest danger is from avalanches passing over precipices or precipitous walls of rock. The very wind they create often prostrates forests and houses. Ice avalanches consist of masses of ice that detach themselves from the glaciers in the upper regions and are heard in summer thundering down the mountains. In the Rocky Mountain country an avalanche is termed a "snowslide." The name is sometimes applied to landslides, or the slip of land from a high to a lower elevation.

AVALON, AVALLON, AVELION OR AVILION, the earthly paradise of Celtic mythology, a "green island" far to the westward, where the sun-god seems to sink to his rest. It was the land of the mystic fountain, the apples (*avlan*), with their strange, magical properties, and the mighty smith who forged "Duré Entaille" for Arthur. The name was applied in the chivalrous poetry of the middle ages to the region where the fairy Morgana holds her court, and afterward by rationalizing historians to the Isle of Saints. It is believed by many to have been on the present site of Glastonbury, on the river Brue, in Somersetshire, famous in romantic British history as an abode of Druids and the place to which Arthur was carried to be healed of his wounds. See CELTIC LITERATURE, Vol. V, p. 325.

AVALON, a peninsula forming the eastern part of Newfoundland, on which St. Johns, the capital, is situated. See NEWFOUNDLAND, Vol. XVII, p. 382.

AVARI OR AVARS, an eastern tribe who made their appearance 100 years later than the Bulgarians in the countries about the Caspian Sea and rivers Don and Volga. About A.D. 555, one part of them passed on to the Danube and settled in Dacia, the others remaining at Caucasus. Those at Dacia served in Justinian's army, and assisted the Lombards in overthrowing the kingdom of the Gepidæ; and about the end of the sixth century, under the mighty Khan Bajan, they conquered Pannonia. Later they made themselves masters of Dalmatia; made devastating incursions into Germany; went into Italy, where they warred with the Franks and Lombards; extended their dominion over the Slavs living on the Danube, and ruled over the Bulgarians as far as the Black Sea. In 640 all these nations rose against them and drove them out of Dalmatia. They were subdued by Charlemagne and disappeared from history in 827.

AVATAR signifies, in Sanskrit, a descent, but is applied particularly to a Hindu deity who descends upon the earth in a manifest shape, either for good or for retributive ends. The Avatars of Vishnu are the most famous in Hindu mythology. The word sometimes is employed rhetorically in English literature as equivalent to manifestation or phase. It is, in general, any incarnation, material or ideal. See BRAHMANISM, Vol. IV, pp. 207, 208.

AVELLANEDA, GERTRUDIS GOMES DE, a Spanish poetess, novelist and author of successful plays; born in Cuba, March 23, 1814; died in Madrid, Spain, Feb. 1, 1873; known to some under the pseudonym of "La Peregrina." *La Cruz*, a poem, the dramas *Egilona*, *Sonambula*, *The Glories of Spain*, and the novels *Dos Mujeres* and *El Mulato Sab*, are among her best-known works.

AVE MARIA, ALSO ANGELICA SALUTATIO OR THE ANGELIC SALUTATION, are names given by the Roman Catholics to a very common form of address to the Virgin Mary. *Ave Maria* are the first two words of the prayer, in Latin, which is taken from the angel Gabriel's salutation (Luke i, 28): "Hail, Mary, highly favored, the Lord is with thee; blessed art thou among women." In this form, according to an ordinance of Gregory I, with the addition of Elisabeth's words, "and blessed is the fruit of thy womb," the invocation was at first said by the priest during mass on the fourth Sunday after Advent. With the extended worship of the Virgin since the eleventh century, the Ave Maria appears as a lay-prayer of equal use with the Paternoster, and was sanctioned as such at the end of the twelfth century. Accordingly, not only did Urban IV (1261) add the concluding words, *Jesus Christus, Amen*, but since the first half of the sixteenth century the prayer began to receive, more and more commonly, as an addition to the old formula, what constitutes the conclusion or invocation of the modern form: "Holy Mary, mother of God, pray for us sinners, now and at the hour of our death. Amen."

AVENEL, PAUL, French author; born at Chaumont, Oct. 9, 1823. He has published many historical and romantic novels and dramas, among them: *Antithèses Morales* (1850); a collection of stories called *Coin du Feu* (1839); *Roi de Paris*, a historical romance (1860); and *Docteur Hatt* (1887).

AVENGER OF BLOOD. See BLOOD, AVENGER OF, in these Supplements.

AVENTINE HILL, the one of the seven hills of Rome which lay farthest to the south, near the Palatine, and on the left bank of the Tiber. Northeast of it lay the Circus Maximus, and east of it the Thermæ of Caracalla. It was first included in the limits of Rome by Servius Tullius. On it were placed by that ruler a line of fortifications. Later a temple to Diana was erected there.

AVENTURIN GLASS OR GOLD-STONE, an

iridescent glass possessing a rich brown color, dotted with colors produced by the incorporation of iron and brass filings; manufactured in Venice; first found in Aventura, Spain, whence its name. Aventurin is also a mineral consisting of quartz spangled with scales of mica or other mineral. See GLASS, Vol. X, p. 66.

AVERELL, WILLIAM WOODS, general and inventor; born at Cameron, New York, Nov. 5, 1832; graduated at West Point in 1855; served in garrison at Carlisle, Pennsylvania, until 1857; from then until 1861 did frontier duty against the Kiowa Indians; was promoted to be lieutenant of mounted riflemen in 1861; appointed colonel in August, 1861; was with the army of the Potomac in most of its campaigns; conducted cavalry raids in 1863; was breveted through all ranks to major-general; resigned May 18, 1865. He was consul-general to the dominion of Canada from 1866 to 1869, at which time he became president of a large manufacturing company. In 1869–70 he discovered a process of obtaining cast-steel direct from the ore; in January, 1879, invented the American asphalt pavement; in 1884–85 invented the Averell insulated conduit for electric wires, and also a machine for laying electric conductors underground.

AVERY, WAITSTILL OR WAIGHTSTILL, lawyer and patriot; born at Groton, Connecticut, May 3, 1745; died in Burke County, North Carolina, March 15, 1821; graduated at Princeton in 1766; went to Mecklenburg, North Carolina, to practice law; was one of the alleged signers of the "Mecklenburg Declaration"; was sent to the Hillsborough congress in 1775; in 1776 was sent to the state congress; in 1777 was elected attorney-general of the state; and in 1779 was colonel of militia in active service.

AVERYSBOROUGH OR AVERASBORO, a village in Harnett County, central North Carolina, on Cape Fear River, 32 miles S. of Raleigh, known on account of a battle fought there March 16, 1865, in which the Federals under Sherman repulsed the Confederates under Hardee, who was moving to join General Johnston in his closing campaign of the Civil War. Population 1890, 53.

AVESTAN OR ZEND LANGUAGE. See PERSIA, Vol. XVIII, pp. 653, 654.

AVEZZANA, GIUSEPPE, soldier; born in Chieri, near Turin, Italy, Feb. 19, 1797; died in Rome, Dec. 25, 1879; served under Napoleon from 1813 to 1814; in the Sardinian army against Napoleon; fought against the restoration of Ferdinand VII to the Spanish throne in 1823; was captured, and when set free went to America; fought in Mexico against the Spaniards in 1827; served under Santa Anna in 1832. In 1834 he engaged in business in New York, where he remained until 1848, when he returned to Italy to take part in the revolution; in 1849 was appointed minister of war of the Roman republic; again went to New York when the French took Rome in July, 1849; returned to Italy to fight under Garibaldi in 1860; became prominent in the Italian house of representatives, and was a leader of the Irredentists in 1878.

AVIANUS OR AVIANIUS, FLAVIUS, Italian fabulist; date uncertain, probably during fourth century; of his writings only 42 verses in the manner of Æsop's fables, are extant. These fables were used in the schoolbooks of the middle ages. See FABLE, Vol. VIII, p. 838.

AVIARY, a place or inclosure for keeping birds. Amongst the Romans the name *aviarium* was sometimes used of a place for keeping and fattening birds meant to be killed for food. A large form of aviary is to be seen in nearly every public zoölogical garden.

AVICENNIA, a genus of plants of the family *Myoporaceæ*, a family very nearly allied to *Verbenaceæ*, and found almost exclusively in the southern hemisphere. This genus consists of trees or large shrubs. They resemble mangroves in appearance, and, like them, grow in salt swamps. Their creeping roots often curve above the mud for the space of six feet before penetrating it, and the naked asparagus-like shoots which they throw up have a very singular appearance. *Avicennia tomentosa*, the white mangrove of Brazil, has cordate ovate leaves. Its bark is used in tanning. The *Avicennia resinifera* has a green resinous substance exuding from it, which is eaten by the New Zealanders. The genus is named in honor of the Arabian physician Avicenna. See MANGROVE, Vol. XV, p. 481.

AVIDIUS, CASSIUS, a Roman general under Marcus Aurelius; a native of Syria; commanded a Roman army in the Parthian War, A.D. 165, as a general under Verus; afterwards he took Seleucia and Ctesiphon; was appointed governor of all the eastern provinces; in A.D. 175 proclaimed himself emperor, but was killed by his own officers in the same year.

AVILER, AUGUSTIN CHARLES, a French architect; born at Paris in 1653; died in 1700 at Montpellier; studied in Rome; worked under the younger Mansard in Paris; designed and erected many fine buildings, of which the palace of the Archbishop of Toulouse is the best known; published a *Dictionary of All the Terms of Architecture*, and also a *Course of Architecture*.

AVISON, CHARLES, a musical composer; born at Newcastle, England, about 1710, and died there May 9, 1770. He was a pupil of Geminiani, and is best known on account of his *Essay on Musical Expression*, in which he ranked the French and Italian music above the German. He figures in Browning's *Parleyings with Certain People*. His reputation as a composer rests chiefly upon his concertos.

AVITUS, ALCIMUS ECDICIUS, known as Saint Avitus, whose calendar-day falls on the 17th of June; born in Orleans about A.D. 450; died about 530. He was one of the leaders against Arianism, from which he is said to have converted Sigismund, prince of Burgundy. He was abbot, probably of Misci, surely of Chateaudun, and he presided at the Council of Epaune in 517. He wrote many letters and poems, the principal one extant of the latter being a poem, or rather a series of poems, called *On the Creation*, *On Original Sin*, *On the Deluge*, etc. This poem has been

compared to Milton's *Paradise Lost*, the similarity having attracted much attention.

AVIZ OR AVIS, ORDER OF ST. BENEDICT OF, a Portuguese order of knighthood, instituted in 1143–47, by Sancho I. Its purpose was to aid in the suppression of the Moors. It received the papal confirmation as a religious order under the rules of St. Benedict in 1162. In 1187 the seat of the order is said to have been placed at Aviz. In 1550 Paul III united the grand-mastership to the Portuguese crown, and in 1789 it was changed into an honorary order for the reward of military merit.

AVOCA OR OVOCA, a small river in Wicklow County, southeastern Ireland; flows into St. George's Channel at Arklow; nine miles in length; formed by the union of the Avonmore and Avonbeg. The Avoca valley is famous as the scene of Moore's poem, *The Meeting of the Waters*. See WICKLOW, Vol. XXIV, p. 557.

AVOCADO, ALLIGATOR-PEAR OR AGUA CATA, a fruit-bearing tree (*Persea gratissima*) of the family *Lauraceæ*, a native of the warm climates of America. It is a slender tree, with a domelike top, and grows from 30 to 70 feet in height. The leaves are similar to those of the laurel. The flowers, which are small and acrid, are produced toward the extremities of the branches. The fruit, which is like a pear in size and shape, is usually of a brown color, and has a soft yellow or greenish pulp, somewhat marrow-like, and hence sometimes is called "vegetable marrow," or "midshipmen's butter." It is not very sweet, but of a delicate flavor, which is believed to proceed from a fixed oil. It is highly esteemed in the West Indies. Also called "avocato" and "avigato." See CUSTARD-APPLE, Vol. VI, p. 729.

AVOCET OR AVOSET (*Recurvirostra*), a genus of birds having webbed feet. See STILT, Vol. XXII, p. 552.

AVOGADRO, AMADEO, COUNT, Italian physicist; born at Turin, Aug. 9, 1776; died there July 9, 1856; was elected professor of physics in the Vercelli gymnasium in 1809; in 1820 was appointed to the professorship of mathematical physics at Turin University. In 1811 he discovered what has since been called Avogadro's law as to the atomic theory, one of the principal bases for fixing all atomic weights as used by chemists.

AVON, a village in Livingston County, northwestern New York, on the Genesee River, 19 miles S. of Rochester. It is on the New York, Lake Erie and Western and on the Dansville and Mt. Morris railroads. It is a health-resort, having several sulphur springs. Population 1890, 1,653.

AVONDALE, a village of Hamilton County, southwestern Ohio, a suburb of Cincinnati, from whose center it is three miles distant; is on the Cincinnati, Lebanon and Northern railroad. Avondale railroad station is two miles from the village. The Cincinnati Zoölogical Garden is located here. Population 1890, 4,473.

AWARD is the decision or judgment reached by arbitration or by referees upon a matter which has been committed to them. An award is conclusive upon the parties when it follows the terms of the submission, and when the decision is certain, complete, lawful and contains no palpable mistake. An award can be enforced in the same manner as a contract. Courts of equity have jurisdiction to enforce an award or to set aside or modify it, but an award will not be set aside except for very cogent reasons. See ARBITRATION, Vol. II, pp. 311–313.

AWE, LOCH, a lake in the center of Argyleshire, western Scotland; is about 24 miles long, and extends in a northeast and southwest direction, with a width of from ½ to 2½ miles; is 8 miles from Inverary. The scenery around it is most striking, there being many wooded islands and high mountains, among them Ben Cruachan, 3,669 feet high. The lake is drained by the river Awe, which flows into Loch Etive. Loch Awe was the scene of many battles during the Scottish wars, and there remain the ruins of castles once famous.

AWN (*Arista*), in the flowers of grasses, a solitary pointed bristle, growing either from a glume or a palea. See GRASSES, Vol. XI, p. 55.

AXE, an instrument, usually of iron, edged with steel, for hewing timber and chopping wood. See HAND-TOOLS, Vol. XI, p. 437.

AXE, the name of two small rivers in the southwest of England. See SOMERSET, Vol. XXII, p. 257.

AXEL, archbishop of Lund, in Denmark. See ABSALON, Vol. I, p. 57.

AXESTONE, a mineral, generally regarded as a variety of nephrite. It is of greenish color, is more or less translucent, hard, tough, and not easily broken. It occurs in primitive rocks, always massive, and is found in Saxony, in Greenland, and in New Zealand and other islands of the South Pacific. It derives its name from the use to which it is put by the natives of those islands for making their hatchets. See JADE, Vol. XIII, p. 540.

AXIA, a town of ancient Etruria, discovered in 1808; was about six miles W. of present site of Viterbo, in the province of Latium, western central Italy. Many Etruscan inscriptions have been found there, and many supposedly sepulchral chambers.

AXIL (*axilla*), a term applied in botany to the angle between the upper side of the leaf and the axis from which it grows. Buds generally grow in the axils of leaves, but they do not always develop. A bud may be made to appear in such a situation, and to form a new shoot, by artificial means, such as cutting over the main stem, wounding it above the place where the new branch is desired.

AXIM, an important station and port on the Gold Coast, on the north of the Gulf of Guinea, western Africa, 73 miles W. of Cape Coast Castle; was taken from the Portuguese in 1642, and confirmed to the Netherlands by the Treaty of Westphalia; in 1873 was ceded to the English. Inland from Axim, in the basin of the Ancober River,

and in the district between it and the Prah, there is considerable gold-mining carried on. See GOLD COAST, Vol. X, p. 755.

AXINITE, silicate of alumina with boracic acid, lime, etc., usually occurring in oblique rhomboidal prisms having axlike edges. See MINERALOGY, Vol. XVI, p. 411.

AXINOMANCY, an art practiced by the ancient Greeks, especially with the object of detecting the perpetrators of great crimes. An ax poised upon a stake was supposed to move so as to indicate the guilty individual; or the names of those suspected being pronounced, the motion of the ax at a particular name was accepted as a sign of guilt. See DIVINATION, Vol. VII, p. 293.

AXIS, a genus of deer, abundant on the banks of the Ganges, but found throughout India and in many islands of the Eastern Archipelago. It was known to the ancients by the name *axis*. One of its Indian names is chittra, and by British sportsmen in India it is often called the spotted hog-deer, though that name is also given to a rarer species. The axis has a great resemblance in size and coloring to the European fallow-deer. See SPOTTED DEER, Vol. VII, p. 23.

AXIS, in botany, a term applied to a longitudinal member, upon which lateral members are borne. The main axis of a terrestrial plant is partly above ground and partly below, the root being called the descending axis and the stem the ascending axis. The opposite tendencies appear as soon as a seed begins to germinate, the radicle, or root-axis, descending, and the plumule, or stem-axis, ascending toward the light and air. That part of the stem around which the flowers are arranged is called the axis of inflorescence, and sometimes, in describing some kinds of inflorescence, the terms *primary axis*, *secondary axis*, etc., are employed.

AXIS. (*a*) *Of Revolution.* A straight line about which a body or geometrical figure revolves, or may be supposed to revolve. (*b*) *Of Symmetry.* A straight line about which a body or geometrical figure is arranged symmetrically. (*c*) *Of a Crystal.* A straight line chosen with reference to the arrangement of the faces of the crystal. See MINERALOGY, *Systems of Crystals and Laws of Crystallization*, Vol. XVI, p. 348. (*d*) *Optic.* The direction in a crystal along which light in passing is not doubly refracted. See MINERALOGY, *Refraction*, Vol. XVII, p. 373. (*e*) *Of a Lens.* Any straight line drawn through the optical center of a lens. If the line passes through the center of curvature also, it is called the principal axis. (*f*) *Of a System of Lenses.* The straight line with which the axis of the several lenses in an optical instrument are made to coincide, as in the telescope and microscope.

AXOLOTL. See SIREDON, Vol. XXII, pp. 96, 97.

AXTELL, SAMUEL B., jurist; born Oct. 14, 1819, in Franklin County, Ohio; died in Morristown, New Jersey, Aug. 6, 1891; was a member of Congress from the first California district from 1867 to 1871; was appointed governor of Utah territory in 1874; afterwards was appointed to the same position in New Mexico; from 1882 to 1885 was chief justice of the New Mexico supreme court.

AYACUCHO, a city in the department of Ayacucho, south-central Peru, midway between Lima and Cuzco, between the Cordillera of Peru and the western Cordillera; is about 8,000 feet above sea-level; was formerly known as Guamanga, and was founded by Pizarro in 1539; the name was changed in honor of the battle of Ayacucho, Dec. 9, 1824, in which the Spanish troops made their last fight on the American continent, being defeated by the combined forces of Peru and Colombia. The city has a university, and is the seat of a bishopric. Population 1890, 20,000.

AYALA, PEDRO LOPEZ DE, Spanish statesman and historian, born at Murcia in 1332; died at Calahorra in 1407; was called "El Viejo" to distinguish him from his son. He was taken prisoner at the battle of Nájera in 1367; was carried to England; upon his return to Spain was appointed grand chancellor to Henry II. He is known as a historian, principally by reason of his *History of Castile.*

AYE-AYE (*Chiromys madagascariensis*), a quadruped found in Madagascar. See MADAGASCAR, Vol. XV, p. 170; LEMUR, Vol. XIV, p. 443.

AYESHAH, AYESHA OR AISHA, Mohammed's favorite wife, born at Medina, A.D. 610 or 611; died there about 678. She was only nine years of age when she was married to the prophet. Ayeshah was beloved so tenderly by Mohammed that he was wont to say that she should be the first of his wives to whom the gates of paradise would be opened. Mohammedan historians state that to her charms of beauty were added a knowledge of mathematics, rhetoric and music. She was accused of adultery; but Mohammed produced a revelation from heaven to the effect that she was innocent, so he punished her accusers, and made it an article of faith that whoever should not believe in her purity should suffer the pains of hell forever. By request, Mohammed in his last illness was taken to the house of Ayeshah, and there expired in her arms. After Mohammed's death, Ayeshah was active in the plot which deprived Caliph Othman of his power and life, and was leader of a force to resist the accession of Ali. Her forces were defeated by Ali, and she was taken prisoner. Is called by the Moslems "Prophetess" and "Mother of Believers." The name was also that of the mother of BOABDIL the last Moorish king in Spain; q.v. in these Supplements.

AYLMER, a town in Elgin County, southwestern Ontario, Dominion of Canada, 12 miles E. of St. Thomas, on the Grand Trunk railway; has a number of small factories, canning and packing establishments, etc.; a collegiate institute and mechanics' institute, with a good library in connection. Population 1891, 2,166.

AYLMER-GOWING (MRS.) EMILIA, English dramatist and poet; born at Bath, October, 1846; maiden name was Aylmer-Blake; was married in 1877 to William Gowing, known under the pseudonym of "Walter Gordon." She was educated

in Paris, and first attracted attention by her recitations in French under the tutorship of Lamartine; her first story was *Leon de Beaumanoir*, a Breton tale, written in blank verse; she next produced the dramas, *A Life Race* and *A Crown for Love*, both performed in London with success; her *Ballads and Poems*, and the novels *The Jewel Reputation* and *An Unruly Spirit*, are among her most popular later works.

AYMAR OR AYMAR-VERNAY, JACQUES, an impostor in the art of divination; born in France in 1662. In 1692 a murder and robbery were committed in Lyons, and Aymar was called upon to detect the perpetrators. In some manner he succeeded in discovering one of the criminals. He was then called upon to go to Paris to exhibit his powers before the Prince de Condé, but, utterly failing in his attempts, he was forced to confess himself an impostor, and was sent back in disgrace.

AYMARAS, a race of partially civilized South American Indians, closely related to the Quichuas, or Inca people, whom they resemble in appearance and somewhat in language. The two races formed the chief population of the ancient Peruvian empire, the Aymaras inhabiting the fertile valleys of the Andes. They were skillful in architecture, many of their monuments still remaining. They were also expert workers in gold and silver. As sun-worshipers they claimed Lake Titicaca as the ancient center of their religion, believing that the orb periodically disappeared, and that after an interval of darkness it again emerged from the sacred Isle of that lake. At the present time the Aymaras number about 200,000, located in the provinces of La Paz and Oruro, in Bolivia, and in the Peruvian province of Puno. They are small of stature, have brown complexions, regular and strongly marked features, and straight black hair. They are now zealous Roman Catholics, though still retaining certain heathen observances. They cherish the memory of their ancient empire, and hope for future independence. In 1780, together with the other Peruvian Indians, they revolted and massacred thousands of the Spaniards, and during the war of the provinces for independence they opposed both parties and gave much trouble. See BOLIVIA, Vol. IV, p. 15; PERU, Vol. XVIII, p. 676; RELIGIONS, Vol. XX, p. 364.

AYMESTRY LIMESTONE, a well-marked horizon in the Ludow group of the Silurian system. See GEOLOGY, Vol. X, p. 336.

AYMON, FOUR SONS OF. See ROMANCE, Vol. XX, p. 652.

AYORA, a town of the province of Valencia, southeast Spain. The inhabitants chiefly are engaged in agriculture and oil-making. Population 1890, 4,935.

AYRES, DANIEL, an American surgeon and philanthropist; born in Jamaica, Long Island, New York, Oct. 22, 1822; died in Brooklyn, New York, Jan. 18, 1892; studied at Wesleyan College, Connecticut, and at Princeton, from 1838 to 1841. Three years later he began the practice of medicine in Brooklyn. His professional services brought him membership in several foreign medical societies. Wesleyan *University* conferred the degree of doctor of laws upon him in 1856. In 1857 he became professor of surgery in the Long Island Medical College, filling this chair until 1875, when he was made professor emeritus. In the summer of 1889 he gave $25,000 in money, and land of equal value, for the endowment of the chair of biology at Wesleyan. At the semi-annual meeting of the trustees of Wesleyan University held Dec. 13, 1889, Dr. Ayres presented to the board cash and approved securities to the amount of $250,000, accompanying the gift with no restrictions, save that the money be devoted to the promotion of scientific study in the university.

AYRES, ROMEYN BECK, an American soldier, born at East Creek, New York, Dec. 20, 1825; died at Fort Hamilton, New York, Dec. 4, 1888; graduated at West Point in 1847; served during the final operations of the war with Mexico as brevet second lieutenant. From the close of the Mexican War until the opening of the Civil War he was engaged in garrison duty, first as second lieutenant and later as first lieutenant of the Third artillery. On the breaking out of hostilities in 1861, he was promoted to a captaincy in the Fifth artillery, and was engaged at Blackburn's Ford, July 18th, and three days afterward at Bull Run. He became chief of artillery and participated in the Peninsular and Maryland campaigns. At Chancellorsville he commanded a brigade in the fifth corps, and at Gettysburg, and afterward throughout the war a division of the same corps. He was breveted major for his gallantry at Gettysburg, lieutenant-colonel for bravery in the Wilderness campaign, colonel for his action at the battle on the Weldon railroad, brigadier-general for his action at Five Forks, and major-general for gallant and meritorious services in the field during the war. After the war he was appointed lieutenant-colonel of the Twenty-eighth infantry, but was transferred to the Third artillery in 1870, and became colonel of the Second in 1879.

AYRTON, WILLIAM EDWARD, English scientist; born at London in 1847; entered the government Indian telegraph service immediately after graduation; was professor of natural philosophy and telegraphy at the Imperial College of Engineering, Tokyo, Japan, from 1872–79; was appointed professor of applied physics at the City and Guilds of London Technical College in 1879; and in 1884 chief professor at the Central Institution, South Kensington. His discoveries in applied electricity have been of great service, chief among these being the system of automatic electric transport called "telpherage." Among his writings are *Electricity as a Motive Power*, *Practical Electricity*, and in conjunction with Prof. J. Perry, *Contact Theory of Voltaic Action*. He was made a fellow of the Royal Society, and in 1892 was elected president of the Institution of Electrical Engineers.

AYUNTAMIENTO, the council or governing

body of towns in Spain. It sprang from a similar institution of the ancient Romans, and became firmly established during the long struggles between the Spanish Christians and the Moors; especially was it strong when the nobility were no longer excluded from it. Its power began to wane from the accession of the Bourbon king, Philip V, and the system was abolished. The people, however, remembering their power during the time of its importance, in the Cortes of 1812 at Cadiz demanded the re-establishment of its more important features. Again, on the return of Ferdinand II, it was abolished; but it was restored in 1823, and confirmed by the constitution of 1837. In 1844 a law was enacted depriving the ayuntamiento of its political power, which consisted in the privilege of making up the lists of electors and jurors, organizing the national guard and controlling the police. It is now permitted to deal with municipal matters alone. Its presiding officer is known as the alcalde, who is elected by the people. The government can annul its acts, but the Cortes alone can dissolve it.

AZAMGARH OR AZAM'S FORT, a city in the northwest of India. See AZIMGARH, Vol. III, pp. 168, 169.

AZANI, AZANION OR AIZANI, an ancient city of Asia Minor, in the province of Phrygia, on the river Rhyndacus, 73 miles S.W. of Brusa and 20 miles S.W. of the ancient Cotyæium, now Kintayah. Many ruins are found there, principal among them being a temple and a theater, the latter nearly 14 rods in diameter.

AZAZEL, a name occurring in Lev. xvi, in the account of the rites of the day of atonement. See DEVIL, Vol. VII, p. 137.

AZELAIC ACID (*chem.* $C^9H^{16}O^4$), formed along with suberic acid by oxidizing castor-oil. It is soluble in cold ether and in boiling water. It forms large white needle-crystals, which melt at 106°. By heating with caustic baryta, it yields heptane ($C^7H^{16}$). Called also anchoic acid and lepargylic acid.

AZEVEDO, MANOEL ANTONIO ALVARES DE, Brazilian poet; born at Paolo, Sept. 12, 1831; died April 25, 1852. He was educated as a lawyer. A collection of his poems, with a memoir, was published by his father in 1862, and revealed a lyric genius full of fire, idealism, and melancholy.

AZHAR, a mosque and college in Cairo. See EGYPT, Vol. VII, p. 785.

AZIMUTH, the angle a vertical plane touching a heavenly body makes with the meridian plane. See GEOGRAPHY, Vol. X, p. 198. For the azimuth compass, see COMPASS, Vol. VI, p. 225.

AZO-COLORS, dyestuffs obtained by the action of azobenzene with some of the phenol or naphthol compounds. All aromatic compounds containing the group $NH^2$ may be converted into azo-compounds, or, more strictly speaking, diazo-compounds. There are many varieties, and shades of each variety, of azo-colors. At first there were but three: Bismarck-brown; aniline-yellow; and chrysoïdine, a yellow. Recently there have been discovered acid-yellow, anizol-red, benzo purpurin, Bielrich-scarlet, crocein-scarlet, azo-blue, etc. The two scarlets mentioned belong to the group of secondary azo-colors, the others to the acid azo-colors. The acid azo-colors will dye silk and wool without the use of a mordant. A mordant is necessary to fix them on cotton. The secondary colors, on the other hand, take more readily upon cotton. See TAR, XXIII, p. 59.

AZOIC, a term applied, in geology, to rocks formed prior to the period of organized life. See GEOLOGY, Vol. X, pp. 327, 329.

AZOTIZED BODIES, those substances which contain azote or nitrogen as one of their constituents, and which form part of the living structure of a plant or animal, or are produced during the natural decay. The principal members of the group are *albumen*, present in white of eggs and the juices of plants and animals; *globulin* or *crystallin*, a variety of albumen found in the lens of the eye; *vitellin*, another variety of albumen, composing the greater bulk of the yolk of the egg; *paralbumen*, a third variety of albumen, found in the animal system during certain diseases; *fibrin*, which occurs largely in the seeds of cereals and in animal muscle; *casein* (or cheese-matter), present in all milk; *legumin*, a variety of casein found in peas, beans and leguminous seeds in general; *gelatin*, which is present in the skin, bones and other parts of animals; *chondrin*, a variety of gelatin obtainable from the cornea of the eye and the permanent cartilages; *isinglass*, another variety of gelatin, manufactured from the inner membrane of the floating bladder of sturgeons and other fishes; *glue* and *size*, which are secondary forms of gelatin; *urea*, *uric acid* and *hippuric acid*, which are present in the urine of the higher animals; *creatine* and *creatinine*, occurring in the juice of flesh; several forms of *urinary calculi*, which are found as stone in the bladder; and a very large and important class of *alkaloids*, including strychnin, morphin, quinin, etc.

AZRAÉL, in Moslem mythology, is called the "Angel of Death." It is he who separates the soul from the body. He is sent by Allah, and executes his commissions. No idea of degradation is attached to him in the Moslem mind. He seems rather to have been identified with fate, without any special malignity inherent in his nature. Azrael, Gabriel, Michael and Israfel form the group of the four highest angelic beings who surround the throne of God.

AZUAY, province of Ecuador, lies just north of Loja, the farthest south of the provinces; its capital is Cuenca, which ranks third among the cities of Ecuador. The province is 644 miles long and 276 miles wide; is on the east slope of the Andes. Population 1889, 133,000.

AZUAGA, a town in the province of Badajoz, southern Spain; 37 miles N.E. of Seville and 20 miles E. of Llerena. Population 1887, 8,253.

AZURINE, a fresh-water fish of Europe, said to be a variety of the rudd or red-eye (*Scardinius erythrophthalmus*). It is commonly called the blue roach.

chemist; born at Babcock Hill, New York, Oct. 22, 1843; attended Tufts College, Massachusetts, and Cornell University, New York; studied in Germany at Göttingen University; was the inventor of the Babcock milk-tester; was for a time chemist at the New York State Experiment Station; for several years professor of agricultural chemistry at the University of Wisconsin. He has made a special study of milk and its products, and has written many articles upon the subject. He is one of the authors of a *Manual of Qualitative Chemical Analysis.*

BABEAU, ALBERT ARSÈNE, a French historian; born at Cambrai in 1835. He settled at Troyes for the purpose of studying the books upon local history and administration of the times previous to the Revolution. He was made secretary of the Academical Society of Aube; in 1887 was elected correspondent of the Academy of Moral Science, and in 1891 was decorated with the order of the Legion of Honor. Among his works are *History of Troyes During the Revolution; France and Paris Under the Directory;* and *Paris in 1789.*

BAB-EL-MANDEB, a cape and strait, the cape is the most southwestern point of Arabia, and the strait flows between it and the French colony of Obock, Africa. It is 15 miles wide, and connects the Red Sea with the Indian Ocean through the Gulf of Aden.

BABINET, JACQUES, a French physicist; born at Lusignan, March 5, 1794; died in Paris, Oct. 21, 1872. After the downfall of Napoleon he was successively professor of mathematics at Fontenay, professor of physics at Poitiers, and afterward at Paris. He invented and perfected a great number of scientific instruments, and was the author of many memoirs on various branches of physical science. His labors for the promotion of science were largely in the direction of meteorology, to which science he is said to have given its name. See MINERALOGY, Vol. XVI, p. 375.

BABINGTON, CHARLES CARDALE, an English scientist; born at Ludlow, Shropshire, in 1808; educated at St. John's College, Cambridge, where he graduated in 1833. He was for many years professor of botany at Cambridge University. He is widely known as a naturalist, and has published *Flora Bathoniensis; The Flora of the Channel Islands;* a *Manual of British Botany; Flora of Cambridgeshire; The British Rubi,* besides numerous botanical articles in scientific periodicals.

BABINGTON, CHURCHILL, an English classical scholar; born at Ludlow, Shropshire, in 1821; died Jan. 13, 1889; graduated at St. John's College, Cambridge; in 1865 was appointed professor of archæology at Cambridge, and held the position until 1880. He edited several newly discovered Greek manuscripts, as well as a number of old English works. He wrote a number of articles on numismatology, botany and antiquities, and was a contributor to Smith's *Christian Antiquities.*

BABINGTONITE, a mineral of the pyroxene group, a silicate of iron, manganese and calcium; named after William Babington. See MINERALOGY, Vol. XVI, p. 417.

BABIROUSSA (*Sus babirussa*), a species of hog, a native of the Celebes and of the smaller islands of Malaysia. See SWINE, Vol. XXII, p. 774.

BABISTS, a religious sect in Persia. See BÂBI, Vol. III, p. 180.

BABLAH OR NEB-NEB, a name given to the pods which grow on severals pecies of *Acacia* in Senegal and the East, and are used for calico-printing and dyeing drab. See ACACIA, Vol. I, p. 68.

BABOO OR BABU, a term used in Calcutta and other parts of lower Bengal for a Hindu gentleman; often applied to natives who speak or write English, and sometimes used in speaking of clerks.

BABOON. See APE, Vol. II, p. 152; MANDRILL, Vol. XV, p. 476.

BABUYAN ISLANDS OR FIVE ISLANDS, a group of small volcanic islands in the Pacific Ocean, belonging to Spain, off the north coast of Luzon, at lat. 19° N., long. 121° 30′ E. They furnish sulphur; Babuyan Claro is so active in eruptions that it is not inhabited. Area of the group, 175 square miles; population, about 7,000. See PHILIPPINES, Vol. XVIII, pp. 749–751.

BABYLAS, BABYLLUS OR BABILA, SAINT, the martyred bishop of Antioch, who suffered death A.D. 250; remembered in history for the discipline of the Emperor Philip for complicity in the death of Emperor Gordianus, compelling him to do penance publicly. His body, buried first at Antioch, was transferred to Daphne in 351; removed to Antioch by the Emperor Julian in 362. St. Babylas's Day in the Greek Church is September 4th; in the Catholic Church, January 24th.

BABYLON, a town of Suffolk County, southeast New York; on the south shore of Long Island, on the Long Island railroad, about 30 miles E. of Brooklyn; known chiefly as a summer resort. Population 1890, 2,000.

BACCARAT, a French game of cards, in which each player or better deposits a stake which in each case is duplicated by the "banker." Then the banker deals two cards to each player, including himself. Each individual bet is decided by comparison of the total count held by each better with that held by the banker. Generally, in Europe, the court cards count 10 each and the others count according to the spots. The counts range in value by series of 9, 19, etc., and 8, 18, etc., the 9 range being the highest or best count. More cards may be called for by any player, but at the risk of making his count exceed 29, in which case the excess forfeits his bet. If the player's cards count 9 he declares it, when all who hold hands superior to that of the banker may claim the amount of their bets, and the banker claims the other stakes. As played in America, court cards and tens do not count.

BACCHANALIA, the feasts observed among the Romans and Greeks in honor of Bacchus. Those who took part in these celebrations were called Bacchantes by the Romans. See DIONYSIA, Vol. VII, p. 247; ORGIES, Vol. XVII, p. 859.

BACCHUS, Latin name for the god of wine. See DIONYSUS, Vol. VII, p. 248.

BACCIOCHI, MARIA ELISA BONAPARTE, sister of Napoleon I. In 1805 she was made princess of Massa, Lucca, Carrara, and Piombino, and in 1809 received the title of Grand Duchess of Tuscany. Her husband survived her 21 years and her son 13 years. The Countess Camerata, her only daughter, died in 1869. See BONAPARTE, Vol. IV, p. 29.

BACHARACH, a town in the province of Hessen-Nassau, East Prussia; on the Rhine, 24 miles above Coblenz; famous for its wines, its name being derived, so it is said, from a rock in the Rhine, called *Bacchi ara* (altar of Bacchus), whose exposure in very dry weather is regarded as prophetic of a good vintage. It was here that Blücher (Jan. 1, 1814) crossed the Rhine in pursuit of Napoleon's army. Population 1890, 1,984.

BACHE, BENJAMIN FRANKLIN, printer and journalist; born in Philadelphia, Aug. 12, 1769; died there, Sept. 10, 1798; grandson of Benjamin Franklin; went to Paris with his grandfather, and learned printing and type-founding in the establishment of the brothers Didot. Returning to America in 1790, he published the *General Advertiser*, afterward called the *Aurora*, which was one of the most influential journals of the time, and was opposed to the administrations of Presidents Washington and Adams.

BACHE, FRANKLIN, physician and chemist; son of Benjamin Franklin Bache, born in Philadelphia, Oct. 25, 1792; died there March 19, 1864. He received his medical diploma from the University of Pennsylvania in 1814, and was appointed surgeon in the army. In 1816 he began the practice of his profession in his native city; from 1826 to 1832 he was professor of chemistry in Franklin Institute; from 1831 to 1841, professor of chemistry in the Philadelphia College of Pharmacy, and from 1841 to 1864 was professor of chemistry in Jefferson Medical College. He was president of the American Philosophical Society in 1854 and 1855, and of the Deaf and Dumb Asylum Corporation at the time of his death. He was the author, compiler and editor of a number of standard works on chemistry and cognate subjects, and a large contributor to scientific journals. In conjunction with Dr. George Wood he prepared a *Pharmacopœia*, the basis of the present *United States Dispensatory*.

BACHE, GEORGE M., naval commander; born Nov. 12, 1840, in the District of Columbia; graduated at Annapolis in 1860; became a lieutenant in 1862; commanded the ironclad *Cincinnati* until that vessel was sunk in 1863; then was in command of three vessels of the Mississippi squadron; was wounded in the assault on Fort Fisher. He won the admiration of his superiors by his bravery at critical times. He was placed on the retired list, on account of disabilities, April 5, 1875.

BACHE, HARTMAN, engineer; born in Philadelphia in 1797; died there, Oct. 8, 1872; son of Benjamin Franklin Bache; graduated at West Point, 1818; was employed under the direction of the War Department for 47 years. In 1865 he was breveted brigadier-general for meritorious service—the highest grade in the engineer corps. The construction of the Delaware Breakwater and the successful application of iron screw-piles for the foundation of lighthouses on reefs and shoals were among his conspicuous works. He was a member of the lighthouse board from 1862 to 1870; was placed on the retired list in 1867.

BACHE, RICHARD, second postmaster-general of the United States; born at Settle, Yorkshire, England, in 1737; died in Berks County, Pennsylvania, in 1811; followed his brother Theophylact to the colonies, and in 1770 became his agent in Philadelphia and accumulated a fortune. At the beginning of the Revolution he was president of the Republican Society in Philadelphia. In 1767 he married the only daughter of Benjamin Franklin, whom he succeeded as postmaster-general in 1776.

BACHE, SARAH, only daughter of Benjamin Franklin, and wife of Richard Bache; born in Philadelphia, Sept. 11, 1744; died Oct. 5, 1808. During the war for independence she was untiring in her efforts to mitigate the hardships of the soldiers, for whom she collected large sums of money and hospital stores. At one time over 2,000 women worked under her direction in sewing for the army during the winter of 1780.

BACHE, THEOPHYLACT, merchant; born in Settle, Yorkshire, England, Jan. 17, 1734; died in New York, Oct. 30, 1807; came in 1751 to New York, where he engaged in business, also becoming the owner of vessels engaged in privateering. He was prominently connected with the events leading to the war of the Revolution, being, in 1774, one of the committee to carry out the resolutions of non-intercourse; but, on account of his neutrality when hostilities began, incurred the suspicions of the Committee of Safety. Remaining in New York during the British occupation, he was able to render assistance to continental officers held as prisoners of war.

BACHE, WALTER, English pianist, born in Birmingham, England, June 19, 1842; died March 26, 1888; studied in Rome; went to Leipsic in 1858; in 1862 returned to Rome to study under Liszt, whose ardent admirer he became. His enthusiasm for Liszt did more than any other influence to bring that composer into prominence in Britain. The Liszt scholarship at the Royal Academy of Music is largely due to Bache.

BACHELOR'S BUTTONS, a name given to several species of RANUNCULUS. See HORTICULTURE, Vol. XII, pp. 252, 259.

BACHMAN, JOHN, an American naturalist; born in Dutchess County, New York, Feb. 4, 1790; died in Charleston, South Carolina, Feb. 25, 1874; pastor of a Lutheran congregation in Charleston from 1815 to the end of his life. He is best known for his valuable contributions to natural history, and as the associate of Audubon in the preparation of the great work of the latter on ornithology.

He wrote *Two Letters on Hybridity, Characteristics of Genera and Species.*

BACHMUT, BAKHMOOT OR BAKMUT, a city in the province of Ekaterinsolaff, southern Russia, 120 miles E. of the town of Ekaterinsolaff; is a market for trade in tallow, meat, grain, horses and cattle; there are coal-mines in the vicinity; here are the remains of an ancient Tatar wall. Population, about 16,000.

BACILLARIACEÆ, minute vegetable organisms. See DIATOMACEÆ, Vol. VII, p. 169.

BACILLI OF DISEASES. See BACTERIOLOGY, and SURGERY, AMERICAN, in these Supplements.

BACILLUS is the name commonly applied to bacteria, although it properly belongs to a separate genus of SCHIZOMYCETES; q.v., Vol. XXI, p. 398.

BACK, SIR GEORGE, a British navigator; born in Stockport, Nov. 6, 1796; died June 23, 1878. After serving against the French in 1809, in 1819 he accompanied Sir John Franklin on an Arctic voyage; was sent out in 1833 to search for Captain Ross, and made several important discoveries. He was knighted in 1839 and made an admiral in 1867. He published an account of his Arctic voyages. See GEOGRAPHY, Vol. X, p. 193; POLAR REGIONS, Vol. XIX, pp. 319, 320.

BACKUS, CHARLES, Baptist clergyman; born in Norwich, Connecticut, Nov. 5, 1749; died in Somers, Connecticut, Dec. 30, 1803; graduated at Yale in 1769; was the theological teacher, in his own house, of many notable students; published sermons, including *Five Discourses on the Truth of the Bible.*

BACKUS, ISAAC, a clergyman and writer of religious history; born in Norwich, Connecticut, Jan. 9, 1724; died in Titicut, Connecticut, Nov. 20, 1806. He was at first a Congregationalist, but changed to the Baptist Church in 1756; in 1774 was sent to Congress by the Warren Baptist churches to claim the same rights accorded other churches; in 1788 was a delegate to the convention that adopted the Federal constitution. He wrote many historical articles, the chief among them being a *History of New England, with Special Reference to the Baptists*, a denomination that has a historical society named for him.

BACON, DELIA, teacher and writer; born at Tallmadge, Ohio, Feb. 2, 1811; died at Hartford, Connecticut, Sept. 2, 1859; daughter of David Bacon, missionary to the Indians, and sister of Dr. Leonard Bacon. For some time she was a teacher and lived near Boston, where she delivered a course of lectures. She wrote *Tales of the Puritans; The Bride of Fort Edward* (a drama); and *Philosophy of the Plays of Shakespeare Unfolded.* The latter raised much criticism, as in this work she sought to prove that the Shakespearean plays were the joint work of Shakespeare, Bacon and other writers.

BACON, EZEKIEL, jurist; born in Boston, Massachusetts, Sept. 1, 1776; died in Utica, New York, October 18, 1870; graduated at Yale in 1794; began the practice of law in Stockbridge, Massachusetts; was a member of the general court in 1806–07; representative in Congress from 1807 to 1813; chief justice of the court of common pleas of western Massachusetts in 1813, and comptroller of the United States treasury from 1813 to 1815. Moving to New York, he was there successively elected member of the legislature, judge of the court of common pleas, and member of the state constitutional convention held in 1821. He was defeated for Congress in 1824. He published *Recollections of Fifty Years Since.*

BACON, HENRY, artist; born in Haverhill, Massachusetts, in 1840; took part in the Civil War until 1864, when he went to France to study painting. His masters there were Cabanel and Edward Frère. He has taken for his subjects scenes on transatlantic steamers and peasant-life in France. Among his paintings are *Franklin at Home; Land! Land! The Luck of Roaring Camp;* and *Boston Boys and General Gage.*

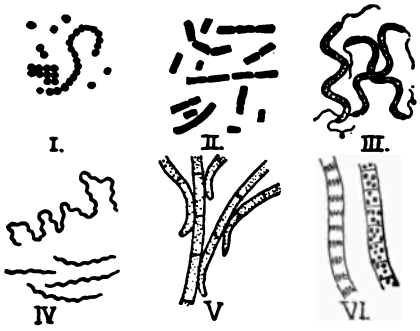
BACON, LEONARD, clergyman; born in Detroit, Michigan, Feb. 19, 1802; died in New Haven, Connecticut, Dec. 24, 1881; was pastor of a Congregational church in that city 57 years. He was successively professor of didactic theology and lecturer on church polity and history in Yale College from 1866 to 1881. He assisted in founding and editing the *Independent* and the *New Englander*, and wrote numerous works on Congregational history. He was a strong supporter of the anti-slavery cause and a stanch Unionist throughout the war. Among his works are *Slavery Discussed in Occasional Essays*; *Christian Self-Culture*; and *The Genesis of the New England Churches.*

BACON, LEONARD WOOLSEY, clergyman; son of Leonard Bacon, mentioned above; born in New Haven, Connecticut, Jan. 1, 1830; graduated at Yale in 1850; was pastor of the Congregational Church at Litchfield, Connecticut, from 1857 to 1860; from 1872 to 1877 he studied in Europe, most of the time at Geneva; after his return he was pastor at Norwich, Connecticut; Brooklyn, New York, and Philadelphia, Pennyslvania. He is well known as a hymn-writer. Among his published writings are *The Vatican Council* (1872); *Sunday Observance and Sunday Law* (1882), and *Simplicity that is in Christ.*

BACON, NATHANIEL, a colonial Virginian leader; born in Suffolk, England, Jan. 2, 1647; died in Virginia, Oct. 29, 1676; emigrated from England about 1670; in 1672 became a member of the council. He gained popular favor by his eloquence, and in 1676 was chosen by the people to lead them in their war with the Indians. His expedition was declared a treasonable one by Governor Berkeley, who proclaimed Bacon a traitor. He was tried and acquitted. He then demanded of Berkeley a royal commission, so that he might legally act as head of the colonial militia. This Berkeley refused, and immediately Bacon, with the promptness that was a characteristic of the man, marched at the head of an armed force to compel the governor to issue the commission. Upon his arrival in Jamestown he was called a rebel by Berkeley, who, however, was

forced to issue commissions to Bacon and his subordinate officers. Berkeley was also compelled to assent to the enactment of a number of laws beneficial to the colony and to the repeal of obnoxious laws. Again the Indians invaded the colony and Bacon set out to suppress them. He was successful in that; but while he was away from Jamestown, Berkeley undid all the good that had been accomplished. Bacon hastily marched to Jamestown, and then began the war that has since been known as Bacon's rebellion. He attacked Jamestown, compelled Berkeley to evacuate and take refuge with the fleet in the James River. Bacon's force being too small to do battle with the fleet, he burned the town. Here, however, his career ended, his premature death putting an end to the small war. The laws enacted according to his dictation were known to the people afterward as "Bacon's laws."

*BACTERIOLOGY is that division of botany which treats of bacteria. The name *bacteria* has been applied in a general way to the whole group of *Schizomycetes*, under which title a full discussion of their structure and classification may be found. They are the minutest of organisms, always one-celled, though these cells may occur in filamentous chains, or in plates, or in masses, in most cases without chlorophyll, and with the power of remarkably rapid multiplication by cell-division, hence very commonly called "fission-fungi." They form a group closely related to the *Cyanophyceæ*, or "blue-green algæ," and are often associated with them under the group name *Schizophytes*. While generally associated with the fungi, some botanists have included them under algæ, on account of their evident relationship with *Cyanophyceæ* and the occasional presence of chlorophyll. Others separate them from both algæ and fungi, as a separate great division of thallophytes, along with the *Cyanophyceæ*. Whatever may be their proper taxonomic position, they present so many special problems in their morphology, in their physiology, in their effects upon substances and organisms with which they are associated, in their economic importance, and in the necessity of a special technique for their study, that they form a large and sharply differentiated field of work, fully justifying the specialization of a group of biologists known as "bacteriologists."



BACTERIAL FORMS.

I. Coccus; II. Bacillus; III. Spirillum; IV. Spirochæte; V. Cladothrix; VI. Beggiatoa. (After Rabenhorst.)

*Morphology.* A brief account of the morphology of Bacteria will serve as an introduction to the technique of their study and their physiology. They occur everywhere,—in air, in water, and in soil,—but can be reduced to three types of body, viz.: (1) the coccus forms, in which the cells are spherical (as in *Micrococcus*), occurring either singly or in pairs, or in nostoc-like chains; (2) the rod forms, as in *Bacterium* and *Bacillus*, in which the cells are cylindrical, occurring either singly or in filamentous chains (in which case the filament may be invested by a mucilaginous sheath), or even in branching filamentous colonies (as in *Cladothrix*); (3) the curved forms, in which single cylindrical cells may be more or less curved, as the "comma bacillus," or filamentous colonies of such cells may develop a more or less spiral form (as in *Spirochæta*). The constancy of these forms is an open question, some bacteriologists claiming that they are convertible or mutually derivative forms. There seems to be no doubt that polymorphism does occur, but its extent has not been ascertained. In no case does the cell-membrane give the cellulose reaction characteristic of most cell-membranes, but consists of an albuminous substance in which occasionally there is found a carbohydrate different from cellulose. This simplicity of the cell-wall, which may possibly be regarded as primitive, is accompanied by simplicity of cell-contents, no nucleus having been detected, although the staining of the whole plasmic body would seem to indicate the diffused presence of chromatin. These facts have led certain bacteriologists (Klebs and Bütschli) to consider the whole cell to represent a nucleus surrounded by a membrane in which the cytoplasm is entirely reduced or almost so. The coloring matters produced by many bacteria are various, and are either the result of the fermentation which they produce in the nutrient solution, or are secreted by the cells for some specific physiological purpose. The colors are all shades of yellow, red, blue, violet and brown.

Peculiar to bacteria (and certain *Cyanophyceæ*) is the so-called "zoöglœa" condition to be observed in many forms, in which case the cells become strongly mucilaginous, and numbers of them are found embedded together in a mass of mucilage, just as *Nostoc* among the *Cyanophyceæ*. These mucilaginous masses usually form pellicles ("scum") upon the surface of the nutrient medium. In case the surface is restricted in area, the pellicle becomes variously wrinkled. The cells thus embedded continue in a state of active division, but may eventually escape from the mucilaginous matrix and continue their division independently. The "resting stage" condition into which many bacteria pass upon the approach of unfavorable nutrient conditions is, so far as known, without a parallel in any other group of plants. It consists in the formation of endospores,—a process which has been carefully observed in *Bacillus subtilis*, and described by Migula as follows: "The motile rodlike cells come to rest and develop into long multicellular filaments which form a pellicle over the surface of the nutrient medium. The hyaline cell-contents become turbid, and small granules are visible with

*Copyright, 1896, by The Werner Company.

high magnification. Then at one end or in the center of the cell there appears a light spot which grows larger and becomes a brightly shining refractive body, and in its growth fills the cell or even distends the cell-wall. As this 'endospore' develops, the cell-contents gradually disappear, until when the endospore is mature it is covered by the cell-membrane alone. This membrane next becomes gelatinous, dissolves, and thus frees the endospore, which now is covered by a tough membrane." There are various modifications of this process in different forms. In *Bacillus tetani* (the bacillus of tetanus) the endospore is formed in one end of the cell, and so distends it as to give to the cell a peculiar "drumstick" appearance. In other cases (as in *B. amylobacter*) the endospore distends the center of the cell, and produces a spindle-shaped outline. In some cases not all of the cell-plasma is used by the endospores. In most cases but one endospore is formed in a cell, but in *B. ventriculus* and *B. inflatus* two are often formed. The vitality of the mature endospores is remarkable, being capable of resisting prolonged desiccation, high temperatures, and many of the common antiseptics. They form the so-called bacterial "germs" of popular writing. Upon coming in contact with a favorable nutrient medium, the endospore rapidly germinates, swelling up by the absorption of liquid, bursting or dissolving its tough wall, and protruding a newly formed bacillus-cell, to which it sometimes remains attached for a time as a cap.

The so-called arthrospores of certain groups represent another phase of the resting-stage; but this seems to be but the general result upon all cells of diminishing food-supply. Under such conditions the protoplasm becomes denser and less hyaline and somewhat shrunken, the vegetative work of the cell being reduced to a minimum. Such a structure is to be regarded as a temporary condition of a cell, rather than a differentiated "spore."

The reproduction of bacteria is by means of a very rapid cell-division, but in some of the higher forms, as *Chlamydobacteriaceæ*, true asexual spores are also found. They do not have the function of the endospores, which seem to serve simply for protection during unfavorable conditions, but germinate immediately upon formation, and serve for multiplication. In the groups producing asexual spores the cells are held together in filaments, often branching, by a mucilaginous sheath. The spores, having been formed from the cells, either by division or without it, escape from the sheath either as motile or non-motile bodies, and develop new filaments. The formation of spores by the abstriction of certain parts of the filament has been observed in *Thiothrix*, while in *Crenothrix* large and small spores are formed, the significance of which is obscure.

*Methods of Study.*—It has been discovered that the ordinary morphological characters, such as individual form and structure and reproductive habit, are of service in distinguishing bacterial species only in special cases. Resort has therefore been had to "artificial cultures," by means of which the different species are separated, and, as colonies, show recognizable microscopic characters, either in their own appearance or in the changes which they induce. The ordinary culture media used are composed of beef-broth mixed with bone-gelatin or vegetable-gelatin (agar-agar), so that they may be liquid or solid with slight changes of temperature. Plate-cultures are used to separate species. A small quantity of the liquefied medium, containing a trace of the substance containing mixed bacteria, is poured upon a sterilized glass plate. By the hardening of the medium, the scattered bacteria are held apart. Each cell becomes the center of a colony, the different colonies being recognizable to the naked eye. By means of a sterilized platinum needle a small quantity of any desired colony may be removed to a test-tube containing a properly sterilized culture-medium, in which the isolated species may be developed as a "pure culture." These pure cultures show very definite characters in their development, colonies of different species varying from each other in the shape and general structure of the patches formed, in color and luster, as well as in their effect upon the medium (liquefying it or not). Some of these characters may be changed with continued cultivation, nor are they always the same on different media. It is therefore evident that a wide range of observation is necessary for the establishment of any species.

*Physiology.*—Many forms possess the power of more or less rapid locomotion, mostly through the development of extremely fine protoplasmic threads or "cilia" from the membrane. These cilia seem to have no connection with the plasmic cell-contents, as is evidenced by plasmolyzed bacteria, in which the protoplasm has been withdrawn from that part of the membrane bearing cilia, and still the power of motion is retained. The movement is a forward one, combined with rotation on the axis. The cilia are attached at one or both poles of the cell, or are distributed over its surface. The power of locomotion may persist throughout the life-history of the individual, or may be restricted to longer or shorter periods of its history.

The chief interest, however, centers about the chemical changes involved in the life of bacteria, especially in their relation to the nutrient substances from which they obtain their food-supply. Associated as certain species are in the popular mind with contagious diseases, the great usefulness of many of the group is lost sight of. Upon the basis of food-supply, bacteria may be divided into parasitic and saprophytic forms, according as they prey upon living animals and plants, or live upon dead organic material or the products of organisms. Among the parasitic forms are to be found those associated with certain plant and animal diseases. Among the saprophytic forms are to be found those which induce useful changes in organic substances. Bacteria may be always either parasitic or saprophytic (*obligate* forms) or

they may be able to live in either condition (*facultative* forms). Upon the basis of their prominent effects, bacteria may be divided into pathogenic, chromogenic and zymogenic forms. The pathogenic forms are necessarily parasites, and induce disease, generally by producing poisonous substances among the products of the fermentation they induce in attacking the tissues of the host, in which capacity they are "organic ferments." Some of the pathogenic forms attack but a single host, others (as *Bacterium tuberculosis*) can utilize a wide range of hosts. The chromogenic forms are readily recognized by the coloring matters they produce. The zymogenic forms are those which produce "inorganic ferments" (enzyms), which induce fermentation without themselves being changed. Upon the basis of oxygen supply, bacteria may be either aërobic or anaërobic, dependent upon their need of free oxygen or not. Certain bacteria can live without a supply of free oxygen if living in a solution in which they can produce fermentation; but if such is not the case, free oxygen must be available. Hence there are facultative and obligate aërobic and anaërobic forms; many of the pathogenic forms being facultative anaërobic forms. Notable among bacteria are those forms concerned in the process of "nitrification," and in the separation of sulphur and iron from watery solutions. The nitrifying bacteria change organic nitrogenous substances into soluble salts of nitric acid, thus performing an immense service in preparing the nitrogenous materials of the soil for absorption by plants, and in transforming into harmless and usable forms the nitrogenous wastes found in water. A striking expression of this work among the nitrogen compounds is to be seen in the niter or saltpeter beds. The sulphur-bacteria occur chiefly in waters in which hydrogen sulphid is being formed from the decay of plants and animals. The bacteria oxidize the hydrogen-sulphid and deposit masses of sulphur. The sulphur is then oxidized into sulphuric acid, which usually unites with lime and forms calcium sulphate. The iron-bacteria play the same part in waters containing iron, much of the iron deposits (ocher-colored slime) about bogs and springs probably being due to their activity. Many of the marine forms also produce a somewhat intense phosphorescence.

From the above statements it becomes apparent that bacteria are largely concerned in some of the most important processes of nature, notably in attacking complex organic substances, and reducing them to simple and mostly soluble forms useful to green plants (the changes known as "decay"); also in inducing, in connection with these changes, many useful fermentations, such as occur in milk and various fruit juices.

Of most immediate interest to man, however, are the injurious pathogenic forms, which produce disease in his own body, or in the bodies of useful animals and plants. Many destructive plant diseases have already been traced to a bacterial origin (as "pear-blight"), while in many of the so-called "infectious" diseases of man and other animals the causal relation of bacteria has been demonstrated.

The following are among the noteworthy saprophytic forms: *Leptothrix ochracea*, one of the iron-bacteria, multiplying enormously in iron-impregnated waters; *Micrococcus ureæ*, producing fermentation of urine; *M. nitrificans*, a species concerned in the process of nitrification; *M. prodigiosus*, found in starchy foods, and having the power of producing an intensely blood-red coloration which gave rise to the superstition of "bloody hoste"; *Leuconostoc mesenterioides*, the "frog-spawn" bacterium, which occurs in sugar manufactories, producing a viscous fermentation in sugar solutions; *Bacterium aceti*, the vinegar-bacterium; *Bacillus lacticus*, producing lactic-acid fermentation in the sugar of milk, the lactic acid ultimately causing the coagulation connected with the formation of cheese, and entering with other forms (*Dispora caucasica*, etc.) into the formation of "Kefir-grains" of the Caucasus; *B. amylobacter*, an anaërobic form, active in food-destruction, producing the butyric-acid fermentation; *B. subtilis*, developed in all decoctions of hay; *Beggiatoa* species, the most prevalent "sulphur-bacteria."

The following are among noteworthy parasitic forms: Harmless parasites occur in the alimentary canal of animals, such as *Sarcina ventriculi*, occurring in small masses, and only known in the human stomach and intestines; many mildly active parasites are found in the mouth, such as *Leptothrix buccalis* and other forms which contribute to tooth-decay; among dangerous parasites are *Streptococcus pyogenes* of malignant puerperal fever, *S. erysipelatis* of erysipelas, *Micrococcus pyogenes* of abscesses, *M. gonorrheæ* of gonorrhea and inflammation of the eyes, *Bacterium anthracis* of anthrax (splenic fever, etc.), *B. pneumoniæ* of pneumonia and cerebro-spinal meningitis, *B. tuberculosis* of consumption, *B. lepræ* of leprosy, *B. syphilidis* of syphilis, *B. influenzæ* of "grip," influenza, etc., *B. diphtheritidis* of diphtheria, *Bacillus tetani* of tetanus, *B. typhi* of typhus fever, *Microspira comma* of cholera (known as the "cholera bacillus," "comma bacillus," etc.). The synonymy of these species is somewhat perplexing, owing to changes in view from increasing knowledge, but the list given will serve to specify some of the best-known forms.

Knowledge of bacterial forms and their work has led to the development of antisepsis by which undesirable forms are either destroyed or excluded. The familiar operation of canning fruits and vegetables to prevent fermentation seeks first to destroy the micro-organisms present by subjecting them to high temperatures, and then to exclude others by air-tight sealing. The development of antiseptic methods in surgery is well known, by which dangerous inflammation and suppuration with the formation of active poisons may be avoided.

It is by no means certain that all bacterial forms that are found associated with different dis-

eases hold a causal relation to those diseases, and in fact many that were once supposed to be pathogenic have been found to be comparatively harmless. But enough is definitely known to assure bacteriologists that they are dealing with forms that are really pathogenic, whether they have been able or not, in every case, to isolate the specific bacterium and demonstrate its causal relation. The isolation of specific pathogenic forms is accomplished by the ordinary culture methods. When an absolutely pure culture has been obtained, experiments are made in the inoculation of animals with it, to demonstrate whether or not the form under cultivation is the real cause of the disease with which it was found associated. In many cases this demonstration has been successful, and has suggested the further culture of the proved pathogenic species. It has been found that by culture, under certain conditions, it is possible to produce physiological varieties of the original form of nature which differ from it in virulence. Their effects upon the host organism are similar in kind, but very different in degree. It has also been found in some cases that if an organism is inoculated with the cultivated varieties, mild symptoms of the disease will follow, which will result in producing immunity from subsequent attacks of the natural malignant form. Just what change is wrought in the organism to bring about this immunity is a matter of discussion, rather than knowledge. The use of artificial culture-forms as vaccines has proved successful in some diseases; but for others the use of "germicides" is found to be necessary, in the development of which much progress has recently been made.

There is no subject of more practical interest to mankind than bacteriology, and as the science develops in its methods of isolation and culture, and in its demonstration of vaccines and germicides, large results will accrue to mankind in the protection, not merely of the human body, but of useful plants and animals. JOHN M. COULTER.

BACTRIS (from a Greek word meaning a "cane"), a genus of slender palms, numbering about forty species, found along marshy regions in the American tropics, where it sometimes forms impenetrable forests. The Maraja palm bears a grapelike fruit which is eatable. Tobago canes are made from the stems of *Bactris minor*.

BACTRITES AND BACULITES, genera of fossil mollusks, of the family *Ammonitidæ*, order *Tetrabranchiata*. See MOLLUSCA, Vol. XVI, pp. 668, 669.

BADAGRY, a port of Upper Guinea, western Africa, near Lagos, on the Slave Coast; thence the expedition of 1825, under Lander and Clapperton, started on an exploring tour through central Africa. It is under British rule, and formerly traded extensively in slaves. Population, about 10,000. See YORUBA, Vol. XXIV, p. 754.

BADALONA, a seaport in the province of Barcelona, northeast Spain, 6 miles from the city of Barcelona. It carries on ship-building and glass manufacture. The surrounding country is fertile and orange groves abound. Population 1890, 15,974.

BAD AXE, a village, capital of Huron County, eastern Michigan, 17 miles S.W. of Port Austin; on the Saginaw, Tuscola and Huron, and the Flint and Père Marquette railroads. It is a lumbering center. Population 1895, 1,071.

BADDERLOCKS (*Alaria esculenta*), an edible seaweed belonging to the *Laminariaceæ*, growing on rocks in deep water on the shores of Britain, Iceland and the northern parts of Europe. It has a stem 4 to 8 inches long, bearing a few short ribless leaflets, and a terminal membranous olive-green frond 2 to 12 inches long, with a stout mid-rib. The name *badder-locks* (supposed to be "Balder's locks") is Scottish; also called "henware"; in the Orkneys "honeyware"; in parts of Ireland, "murlins."

BADEAU, ADAM, soldier; born in New York City, Dec. 29, 1831; died March 20, 1895; entered the United States Army in 1862; was aid to Brigadier-General Thomas W. Sherman. While serving in this capacity he was wounded in Louisiana. In 1864 he became military secretary to General Grant, in which capacity he remained till 1869. He was consul-general at London from 1870 to 1881; in 1877–78, while on leave of absence, he accompanied General Grant in his tour around the world; was consul-general to Havana from 1882 to 1884. He published a *Military History of General Grant; Aristocracy in England; Grant in Peace*, and *A Conspiracy*, a romance of Cuba.

BADEN-BEI-WIEN, a watering-place in Lower Austria; 12 miles S.W. of Vienna; the Aqua Pannonicæ of the Romans; famous for its warm sulphurous springs; much frequented by the Austrian nobility. Population 1890, 11,262.

BADEN, GRAND DUCHY OF, a state of Germany, at the southwest extremity of the empire; area, 5,822 square miles; population in 1890, 1,657,867; two thirds of the population are Roman Catholics and one third Protestants. The Grand Duke is a Protestant; there are two universities, at Heidelberg and at Freiburg, with, in 1895, 209 teachers and 2,240 students; there are 1,862 other public schools, having 7,483 teachers and 348,262 students in 1895; over half of the area is under cultivation, one third is forest, and the remainder is given up to towns, roads, etc.; at the end of 1893 there were in the state 929 miles of railroad, 801 of which belonged to the state; the principal manufactures are silk ribbons, hats, clocks, musical instruments, etc.; wine-making is an important industry; the revenue for 1895 was estimated to be about $20,000,000; the only debt is the railway debt, amounting to about $83,000,000; the Grand Duke and his household are allowed a yearly income of $446,436. According to the constitution, the legislative power is divided between the Grand Duke and a parliament, consisting of two branches. The upper branch of the parliament is composed of the princes of the reigning family, the heads of the seignorial families, eight members elected by the nobility, the Roman Catholic archbishop, the prelate of the Protestant church, two representatives of the universities, and eight mem-

bers named by the Grand Duke, without regard to rank or birth. The lower branch is composed of 63 representatives of the people, 20 of whom are elected by towns and 43 by rural districts. The members of the second house are elected for four years, one half retiring every two years. The parliament must be convened at least once every two years. The executive department consists of four departments, under the administration of four ministers, which are: Interior; the grand ducal house and foreign affairs; finance and justice; ecclesiastical affairs and instruction. The present grand duke, Frederick, succeeded his father, Leopold, in 1852. The succession belonged to his brother, William, but the latter was mentally incapacitated. For early history and descriptions of the physical geography, see BADEN, Vol. III, p. 224.

BADENI, CASIMIR FELIX, COUNT, prime minister of Austria, was born of Polish parents. His father, a *chef de cuisine* in the household of one of the last kings of Poland, was created a count in recognition of his services. Anna Wierer, a famous German actress, was his aunt, and at her death left him a large fortune. In 1871 he held the office of district chief of Zolkiew; in 1873 became a member of the ministry of the interior, and in 1888 governor of Galicia. The Emperor called upon him to form a ministry at the end of the semi-provisional government of Count Kielmansegg, which had lasted for but three months. There was need of some one able to put a stop to the Anti-Semitic uprisings in Vienna, and who could put into force needed electoral reforms. These demands needed a strong and popular leader of the conservative element. This Badeni was thought to be. He formed a cabinet Sept. 15, 1895, himself taking the office of minister of the interior.

BADEN-POWELL, SIR GEORGE SMYTH, an English legislator, author and diplomatist; born in Oxford, Dec. 24, 1847; graduated at Balliol College, Oxford, in 1876. For three years previous to attending Balliol he traveled in New Zealand and Australia, and published a work on those countries which was pronounced by the London *Times* to be a standard work. He was private secretary to the governor of Victoria in 1877; spent 1880–81 in the West Indies, studying their economic situation, and returned there in 1882 as government agent; in 1885 he was sent on a diplomatic mission to Zululand; in the winter of 1886–87 Mr. Baden-Powell was in Canada and the United States to draw up a report on the fisheries question, and a year later was made special commissioner to Malta to help Sir George Bowen to arrange the details of its constitution. Among his numerous published writings are *Protection and Bad Times*, with special reference to the new British empire (1879); *State Aid and State Interference* (1882); *The Truth About Home Rule* (1888); besides numerous articles in the *Quarterly*, *Nineteenth Century*, *Contemporary* and *Fraser's* dealing with Australian constitutions, imperial defense, import duties, fiscal policy, various details of West Indian, South African and colonial policy, industries in the United States, and other topics of national and international interest. In 1887 he was knighted in commendation of five valuable books on the West Indies.

BADGER, GEORGE EDMUND, statesman; born in Newbern, North Carolina, April 12, 1795; died at Raleigh, North Carolina, May 11, 1866; graduated at Yale in 1813; from 1816 to 1820 was a member of the legislature; from 1820 to 1825 was judge of the North Carolina superior court at Raleigh; in 1841 was appointed Secretary of the Navy, but resigned the same year, giving as his reason the vetoing of the bill to recharter the United States Bank; was elected United States Senator in 1846, holding the position until 1854. He opposed secession in 1861.

BADGER, GEORGE PERCY, an English clergyman; born in Chelmsford, England, in 1815; died in 1888. In 1840 he was ordained a clergyman of the Church of England. He is best known, however, for his attainments and public services as an Orientalist, and by numerous literary works on Eastern subjects, among these being the *Nestorians and Their Rituals*, and an *English-Arabic Lexicon.*

BADGER, OSCAR C., a naval officer; born in Windham, Connecticut, Aug. 12, 1823; entered the navy in 1841; took part in the Mexican War; from 1847 to 1852 was with the Pacific squadron; made a lieutenant in 1855; in 1861–62 was with the Potomac flotilla; lieutenant-commander in 1862; fleet-captain in the attack on Fort Sumter, Sept. 1, 1863; commander in 1866; captain in 1872; and commodore in 1881. He was placed on the retired list in 1885.

BADHAM, CHARLES, classical scholar; born in Ludlow, Shropshire, England, July 18, 1813; died at Sydney, Australia, Feb. 26, 1884; was tutored by Pestalozzi; graduated at Oxford in 1837; appointed professor of classical philology and logic in the University of Sydney in 1867, remaining in the position until his death. Among his publications are editions of Euripides's *Iphigenia* and *Helena;* Plato's *Philebus*, *Laws*, *Euthydemus* and *Symposium;* and *Criticism Applied to Shakespeare.*

BADIN, STEPHEN THEODORE, clergyman; born in Orleans, France, in 1768; died in Cincinnati, Ohio, in 1853; came to the United States after having received a classical education in a Roman Catholic college, and was the first priest ordained in this country, being ordained in the old cathedral of Baltimore in 1793. After a time spent in Georgetown College, where he perfected himself in the English language, he was appointed to missionary work in Kentucky. For three years he was the only priest in Kentucky, but he was given an assistant in 1803. He erected churches in Louisville, St. Louis and Lexington. From 1819 to 1828 he traveled in Europe. On his return he did missionary work in Michigan and Kentucky. The three years previous to his death he lived in Cincinnati. He is the author of several Latin poems.

BAD LANDS, a term translating the *mauvaises*

AZURITE, a name given to the mineral commonly called lazulite and lapis lazuli. See MALACHITE, Vol. XV, p. 315; MINERALOGY, Vol. XVI, p. 399.

AZYMITES, by this term the Greek schismatics designate Christians of the Latin Church, because the latter use unleavened bread in the administration of the Eucharist. In the Western Church the point has never been regarded as being of much importance. The propriety of using or not using leaven turns upon the question whether in instituting the Lord's Supper leavened or unleavened bread was used. The Council of Florence, in 1439, decided there was no sacramental difference. This decision, however, did not stop the discussion, and the difference has entered strongly into some church polemics.

# B

## BABA—BABCOCK

BABA, a Turkish word signifying *father*, originating like our word *papa*, in the first efforts of children to speak. In Persia and Turkey it is prefixed as a title of honor to the names of ecclesiastics of distinction, and is applied particularly to the patriarch of Alexandria. The Anglo-Indians use the word as a term of endearment for a young male child, in a sense similar to the English "baby."

BABA, a legendary being known among the ancient Slavs as the thunder-witch, and supposed to be the Devil's grandmother. She was represented as a vicious little old woman, having knotted hair, a very large nose and sharp, protruding teeth, and being borne swiftly through the clouds in an iron mortar. The modern Czechs call her the Iron or the Golden Baba.

BABA CAPE, a bold, rocky headland near the western extremity of Asia Minor, in lat. 30° 29′ N., long. 24° 6′ E.; about 12 miles from the northern extremity of Mitylene, at the entrance of the Gulf of Adramyttium.

BABAHOYO OR BODEGAS, a town, the capital of the province of Los Rios, western Ecuador, South America, on the Guayas River, 20 miles from Guayaquil. In warehouses here are stored goods which have been sent from Guayaquil, and are to be carried into the interior. The place is famous as a depot for this carrying trade. Population 1890, 2,000.

BABBITT, ISAAC, inventor; born at Taunton, Massachusetts, July 26, 1799; died at Somerville, Massachusetts, May 26, 1862. Being a goldsmith, his attention was turned to alloys, and he produced the first Britannia-ware made in America. His name is best known, however, from his invention in 1839 of "Babbitt metal," a soft alloy prepared from copper, tin and zinc, and used in bearings to diminish friction. The invention was patented in England and Russia. Congress awarded the inventor $20,000, and in 1846 a gold medal was given him by the Massachusetts Charitable Mechanics Association. He became insane and was confined in an asylum at Somerville, Massachusetts, dying there. See ANTIMONY, Vol. II, p. 179.

BABCOCK, CHARLES A., an American naval officer; born in New York, June 12, 1833; died in New Orleans, June 29, 1876; was appointed midshipman in 1850; became lieutenant in 1859; was lieutenant-commander in 1862, and commander in 1869. He was with the North Atlantic blockade squadron from 1862 to 1864; was afterward fleet-captain of the Mississippi squadron. The ordnance barracks erected in 1865 at Jefferson City, Missouri, were built under his supervision. In 1868–69 he was with the South Pacific squadron.

BABCOCK, JAMES F., journalist and politician; born in Connecticut in 1809; died in New Haven, June 18, 1874. For 31 years he edited the *Palladium*. He was collector of the port of New Haven under Presidents Lincoln and Johnson, and was elected by the Democrats in 1873 to the state legislature, and by that body was made judge of the police court in 1874. He was a strong leader in the Whig party, being said at one time to have controlled the nominations of that party. He became a Free-Soiler and supporter of the Union policy during the war. He was a Republican until the rupture between that party and President Johnson, when he went over to the Democrats, by whom he was nominated for Congress, but was defeated by the Republicans.

BABCOCK, JAMES FRANCIS, chemist; born in Boston, Massachusetts, in 1844. He was professor of chemistry in Boston University for five years, and in the Massachusetts College of Pharmacy. For 10 years he was state assayer of liquors. He published reports on foods and on sanitary topics, and invented a fire-extinguisher that has come into general use. Died July 20, 1897.

BABCOCK, ORVILLE E., soldier; born in Franklin, Vermont, Dec. 25, 1835; drowned June 2, 1884, at Mosquito Inlet, Florida; graduated at West Point in 1861; participated in the battles of Vicksburg and Blue Lick Springs, and at the siege of Knoxville. Promoted from captain of engineers to lieutenant-colonel, he was placed on the staff of General Grant, and subsequently served with the Army of the Potomac. At the close of the war he was breveted brigadier-general of volunteers, and then colonel in the regular army, still serving on the staff of the general of the army. When General Grant became President, Colonel Babcock was assigned to duty with him and was his secretary. As superintending engineer of public buildings and grounds he supervised many prominent works, among them constructive work on the Washington aqueduct, the Potomac chain-bridge, and the east wing of the state, war, and navy departments building. Being accused of complicity in revenue frauds, and indicted by the grand jury of St. Louis in 1876, he was tried and acquitted.

BABCOCK, RUFUS, a Baptist clergyman; born in North Colebrook, Connecticut, Sept. 18, 1798; died in Salem, Massachusetts, May 4, 1875. He was tutor in Columbia College, president of Waterville College, three times elected corresponding secretary of the American and Foreign Bible Society, corresponding secretary of the Sunday School Union of Philadelphia, and of the American Colonization Society, and district secretary of the Baptist Publication Society, Philadelphia. He did much pastoral and literary work. Among his books are *Claims of Education Societies; Making Light of Christ;* and a *History of Waterville College.*

BABCOCK, STEPHEN MOULTON, agricultural

BAIL, in criminal law, is the delivery of a defendant to persons who enter into bonds to produce him in court at such a time as may be appointed. The term *bail* is sometimes applied to him who becomes surety for the appearance of the defendant. In the United States a person charged with the commission of a crime, other than a capital offense, may claim bail. In most states, by statute, in crimes punishable by death, bail cannot be given; but by the common law, and in states where not otherwise provided by statute, even in capital offenses the defendant may be admitted to bail, in the discretion of the court. The liability upon the forfeiture of a bail bond is limited by the amount named in the bond. The surety on the bond has the right at any time before forfeiture to arrest the person for whom he is bail, and by delivering him to the proper officer is released from liability. See BAIL, Vol. III, p. 241.

BAILEE. A bailee is one to whom personal property is delivered for the purpose of performing some duty in respect thereto, or deriving some benefit from such property, and thereafter returning it to the owner. All persons who receive personal property for storage or to make repairs, and all who borrow personal property for hire or otherwise, are considered bailees. Where a bailee alone receives benefit from the property, as where he borrows goods for his use without consideration, he is bound to use the greatest degree of care in preserving the goods from injury or loss. Where the parties are mutually benefited, and where goods are hired, the bailee must use such care as he would be expected to use with his own property. Where the bailee receives no benefit from the goods, as where he receives them under his care for the accommodation of the other party, he is liable only in case of gross negligence in caring for the goods. See BAILMENT, in these Supplements.

BAILEY, a wall, space or prison. See ARCHITECTURE, Vol. II, p. 460.

BAILEY, GAMALIEL, American journalist; born at Mount Holly, New Jersey, Dec. 3, 1807; died at sea, June 5, 1859. In 1836, in partnership with J. G. Birney, he began at Cincinnati the publication of an anti-slavery paper called *The Philanthropist*. The office was twice mobbed. In 1847 he started the *National Era* in Washington. In this paper Mrs. H. B. Stowe's *Uncle Tom's Cabin* first appeared.

BAILEY, GILBERT STEPHENS, Baptist clergyman; born at Dalton, Pennsylvania, Oct. 17, 1822; graduated at Oberlin College, Ohio; in 1845–46 was pastor at Cornwall, New York; from 1846 to 1863 did pastoral work in Illinois; was superintendent of missions for his denomination in Illinois from 1863 to 1867, and from 1867 to 1875 was secretary of the Baptist Theological Union at Chicago. He afterward resumed his preaching. He originated the Baptist system of ministers' institutes.

BAILEY, JACOB WHITMAN, naturalist; born in Auburn, Massachusetts, April 29, 1811; died at West Point, New York, Feb. 29, 1857; graduated at West Point in 1832; remained in the army until 1838, during which time he served in South Carolina during the nullification troubles, and at West Point as assistant professor of the natural sciences. He resigned his commission, but remained at West Point up to the time of his death as professor of chemistry, mineralogy and geology. He was the inventor of several improvements in the microscope, principal among them being Bailey's indicator. His microscopic work in natural history placed him in the front rank of investigators. He was president of the American Association for the Advancement of Science when he died, and had contributed freely to Smithsonian literature and scientific periodicals.

BAILEY, JAMES MONTGOMERY, a humorous writer; born in Albany, New York, Sept. 25, 1841; died in Danbury, Connecticut, 1894. He received only a common-school education and learned the carpenter's trade. He served in the Civil War till its close. On his return he became a journalist in Connecticut, purchasing the *Danbury Times* and changing its name to *Danbury News*. He acquired considerable renown for the short, humorous sketches which he published in this paper. Among his books are *Life in Danbury; England from a Back Window; They All Do It;* and *The Danbury Boom.*

BAILEY, JOSEPH, a soldier; born in Salem, Ohio, April 28, 1827; killed near Nevada, Missouri, by desperadoes whom he had put under arrest, March 21, 1867. He entered the United States military service in 1861, and distinguished himself by the engineering skill displayed in building two dams across the Red River, in Louisiana, in 1864, in order to deepen the water in the middle of the channel and thus enable the ships belonging to the Mississippi flotilla to pass over the rapids. By this expedient the imperiled gunboats of Admiral Porter, which accompanied General Banks's disastrous expedition to Alexandria, were enabled to escape capture by the Confederates. For this service Colonel Bailey was made brigadier-general, received the thanks of Congress, and $3,000 from the officers and crews of the rescued fleet. In 1865 he resigned from the army, settled in Newton County, Missouri, as a farmer, and was sheriff of that county when slain.

BAILEY, LIBERTY HYDE, horticulturist; born in South Haven, Michigan, March 15, 1858; graduated at the Michigan Agricultural College in 1882; from 1882 to 1884 was instructor in botany at Harvard College; from 1885 to 1888, professor of horticulture at the Michigan Agricultural College; was then appointed professor of horticulture at Cornell University; is the editor of *American Gardening*. He has written a great deal upon subjects included in his favorite study. Among his works are *Field Notes on Apple Culture; American Grape Training; Annals of Horticulture*, now in its fifth volume; *Horticulturist's Rule-Book;* and *Cross-Breeding and Hybridizing.*

BAILEY, PHILIP JAMES, an English poet; born

at Basford, Nottingham, April 16, 1816; became a student at the University of Glasgow; was called to the English bar in 1840, but never practiced. The first edition of *Festus*, the poem by which he is best known, was published in 1839, and in subsequent editions received a large amount of new matter. It is a feeble production, and little read now, its chief merit perhaps being that it was commenced before the author was 19 and completed in three years. He wrote, in addition, a *Universal Hymn*, *The Mystic*, and *The Age*.

BAILEY, THEODORUS, naval officer; born in Chauteaugay, New York, April 12, 1805; died in Washington, District of Columbia, Feb. 10, 1877. He entered the navy as midshipman in 1818, and reached the rank of rear-admiral. When the Mexican War broke out he conveyed an artillery company to California by way of Cape Horn. He took part in several expeditions, suppressed a riot in Panama, helped in restoring friendly feelings between the United States and the Fiji Islanders, and when the Civil War broke out he commanded the frigate *Colorado*. He led in Farragut's attack on New Orleans and was sent to demand the surrender of the city,—a commission requiring great bravery. From 1862 to 1865 he was in command of the eastern Gulf blockade squadron, when he suppressed blockade-running trade. He commanded at the Portsmouth, New Hampshire, navy-yard in 1865–67, and was placed on the retired list in October, 1866.

BAILEY, WILLIAM WHITMAN, botanist; born at West Point, New York, Feb. 22, 1843; graduated at Brown University, Rhode Island, in 1864; was deputy secretary of state of Rhode Island in 1868; instructor in 1877, and since then professor of botany at Brown University. He has published a *Botanical Collector's Hand-Book*.

BAILIFF. A bailiff is a person to whom is intrusted some care or guardianship. Sheriffs' officers appointed for the care of property taken under execution, attachment or other process are termed bailiffs, as are also the representatives of the sheriff in court, who preserve order in the courtroom.

BAILIWICK, legally the county or district within which the sheriff's bailiffs may execute their office. Blackstone says that this word was introduced by the princes of the Norman line in imitation of the French, whose territory was divided into bailiwicks, as that of England into counties.

BAILLIE, LADY GRIZEL, a Scottish poet; born at Red Braes, Berwickshire, Dec. 25, 1665; died in London, Dec. 6, 1746. She wrote the song, *An' werena my heart licht I wad dee*, and is gratefully remembered for her tender and heroic devotion to her father, Sir Patrick Hume, during his concealment in the vault of Polwarth Church.

BAILLIE, ROBERT, OR BAILLIE OF JERVISWOOD, often called "The Sidney of Scotland," Scottish patriot; born in Lanarkshire about the middle of the seventeenth century; executed Dec. 24, 1684. He distinguished himself during the latter part of the reign of Charles II by his bold opposition to the tyrannical misgovernment of the Duke of Lauderdale. He was accused of conspiring against the king's life, and of being hostile to monarchical government; was tried at Edinburgh, and condemned to death upon evidence at once insignificant and illegal.

BAILLIÈRE, EMILE JEAN and HENRI PAUL, French publishers whose special line is medicine and physics; the first, Emile, was born in Paris, Nov. 7, 1831; went into the publishing business with his father in 1857; became a member of the Paris chamber of commerce in 1859; from then until 1862 was one of the directors of the Bank of France; was decorated with the badge of the Legion of Honor in 1876. His brother, Henri, was born in Paris, Sept. 15, 1840; entered the firm in 1863; is himself the author of many works of merit. Among the publications of the firm are *A New Dictionary of Medicine and Surgery*, consisting of 40 volumes, published from 1864 to 1886; *a Dictionary of Electricity*, and a *Library of Useful Knowledge*, composed of 35 volumes, published from 1887 to 1891.

BAILLON, ERNEST HENRI, French naturalist; born at Calais, Nov. 30, 1827; was elected professor of natural history at the Paris College of Medicine; he was decorated with the badge of the Legion of Honor in 1867; resigned his position in 1888. His principal publications are *General Studies upon the Euphorbiaceæ; Study of the Organogeny of Conifers;* and his monumental *History of Plants*, published in eight large volumes,—one of the most important additions of the century to botanical literature.

BAILLY, JOSEPH A., a French sculptor; born at Paris in 1825; died June 15, 1883; moved to Philadelphia in 1850; became a professor in the Pennsylvania School of Fine Arts; executed the Washington monument in front of the statehouse at Philadelphia; two groups, *The First Prayer* and *Paradise Lost;* two groups, *Adam and Eve* and *Eve and Her Children;* a portrait bust of General Grant, etc.

BAILMENT, in law, is the delivery of personal property by one person to another, under contract, without parting with the title thereto, which goods are to be returned or accounted for at a specified time. The person making the delivery of property is called the bailor; the one to whom the property is delivered is the bailee. Any delivery of goods from one person to another for any purpose, where the ownership does not change, may be said to be a bailment. See BAILEE, in these Supplements.

BAILY'S BEADS, named from Francis Baily, who first fully described them. They are appearances seen at the limb of the moon at the moment of internal contact in a total solar eclipse. They resemble a row of brilliant beads, and are the result of diffraction and irradiation, being very much exaggerated when the telescope is out of focus or imperfect. See BAILY, FRANCIS, Vol. III, p. 245.

BAIN, ALEXANDER, a Scotch metaphysical writer; born at Aberdeen in 1818; graduated at

the University in that city in 1840; occupied the chair of natural philosophy in the Andersonian University of Glasgow in 1845; was appointed assistant secretary to the Metropolitan Sanitary Commission in 1847, and to the General Board of Health in 1850. The publication of *The Senses and the Intellect* (1855) and *The Emotions and the Will* (1859) established his reputation as one of the profoundest investigators of psychological problems. His other important works include *Mental and Moral Science; Logic, Deductive and Inductive; Mind and Body, Theories of Their Relation; Education as a Science; English Grammar*, and *English Composition and Rhetoric*. He was appointed regius professor of logic in the University of Aberdeen in 1860, and lord rector of that university in 1881, and re-elected in 1884. In 1857 he was appointed examiner in logic and moral philosophy in the University of London, and in 1858 was examiner in moral science at the India civil service examinations. See ÆSTHETICS, Vol. I, p. 223; BELIEF, Vol. III, p. 534.

BAINBRIDGE, a town, the capital of Decatur County, southwest Georgia, on the Flint River, at the head of navigation. Much cotton is shipped from here, and also large quantities of tobacco. It is on the Alabama Midland and the Savannah, Florida and Western railroads. There are three private academies. Population 1890, 1,668.

BAINBRIDGE, a small town of Chenango County in southern central New York, situated on the Susquehanna River and the Delaware and Hudson railroad, 25 miles N.N.E. of Binghamton. It has several churches, factories, printing-office and a handsome park. Population 1890, 1,049.

BAINBRIDGE, WILLIAM, American naval commander; born in Princeton, New Jersey, May 7, 1774; died in Philadelphia July 28, 1833. His father was a physician in New York City. When 18 years of age he was mate, and at 19 became captain of a merchant vessel. When the United States navy was reorganized in 1798, he was appointed lieutenant-commandant. In May, 1800, he commanded the frigate *George Washington*, which carried to Algiers the commercial tribute then levied by the dey of that country; and afterward was coerced to convey an Algerine embassy to Constantinople. In 1801 Bainbridge was captain of the *Essex*, which cruised in the Mediterranean. In 1803, in the United States war with Tripoli, he commanded the frigate *Philadelphia*, under Commodore Preble, and while chasing a blockade-runner his vessel grounded and was taken. The captain and his 315 men were prisoners until the peace in June, 1805. After some years of service with merchant vessels, when war with Great Britain became imminent he hastened from St. Petersburg to offer his services to the government. In October, 1812, he sailed from Boston in command of a squadron comprising the *Constitution*, *Essex* and *Hornet*. On December 26, off the coast of Brazil, he captured the British frigate *Java*, of 49 guns, for which Congress distributed among the crew $50,000 as prize-money, voted the commodore a gold medal, and to each of his officers a silver one. In 1815 Bainbridge commanded the Mediterranean squadron. He was afterward president of the board of navy commissioners. In the duel between Barron and Decatur, he acted as second to the latter.



COMMODORE BAINBRIDGE.

BAINES, SIR EDWARD, an English journalist and politician; son of EDWARD BAINES (Vol. III, p. 245); born in Leeds, England, May 28, 1800. He was for many years editor and principal proprietor of the Leeds *Mercury*, and at the time of his death was believed to be the oldest journalist in Europe, having been connected with the press for seventy years. He represented Leeds in Parliament from 1859 to 1874; was a stanch Liberal; long known as an able temperance advocate, a strong nonconformist, and a forceful advocate of parliamentary and municipal reform. He was knighted by the Queen in 1880, and died near Leeds, March 2, 1890.

BAINS (Fr. *baths*), an affix applied to the names of many European cities noted for their thermal springs and curative baths. Of these Aix-les-Bains is prominent. The Teutonic equivalent is *bad*. Thus are found Bad-Ems, Carlsbad, and many other watering-places in Germany.

BAIRD, ABSALOM, an American soldier; born at Washington, Pennsylvania, in 1824; graduated at West Point in 1849, and was assigned to the artillery service; served in the Seminole war, and subsequently as a professor at the Military Academy; at the commencement of the Civil War he was assistant adjutant-general. He participated in nearly all the principal operations of the army of the Ohio during the war, including Sherman's "march to the sea." He was brevetted a major-general in the United States army in March, 1865, and major-general of United States volunteers for distinguished services. He became inspector-general in the army in 1885, and retired, on account of age, in August, 1888.

BAIRD, ANDREW WILSON, a British military and topographical engineer; born at Aberdeen, Scotland, in 1842; received his commission in 1861; went to India in 1864, and was employed on harbor and coast defenses for the Bombay government till 1868. He was then in field-service with the Abyssinian expedition, after which he returned to India and took a leading part in its great trigonometrical survey, the establishment of tidal observatories and other important tasks of scientific engineering.

BAIRD, HENRY CAREY, an American author and publisher; born at Bridesburg, Pennsylvania, in 1825. At the age of 20 he became a partner in the publishing-house established by his grandfather, Matthew Carey, and in 1849 founded the

firm of H. C. Baird and Company. He attained distinction as a writer and publisher of industrial and economic works, and in 1875 quitted the Republican ranks for the forefront of the Greenback party. In 1875 he published a collection of his works.

BAIRD, HENRY MARTYN, an American educator; son of Robert (see below); born in Philadelphia, Pennsylvania, Jan. 17, 1832; graduated at the University of the City of New York, and took a course in theology in Union Seminary and at Princeton, New Jersey. After acting as a tutor of Greek in the College of New Jersey he was called to the chair of Greek languages and literature in his *alma mater* in 1859. He wrote much for periodical literature, and published *The Life of the Huguenots of France* (1879); *The Huguenots and Henry of Navarre* (1886); *The Edict of Nantes and Its Recall* (1886); and several other works.

BAIRD, JAMES, a Scotch philanthropist; born at Kirkwood in 1802; died in 1876. He amassed immense wealth as an iron-master. His blast-furnaces employed at one time more than ten thousand men and boys. He endowed various schools, founded lectures, and spent vast sums of money in the mitigation of destitution among the people of his native land. See SCOTLAND, Vol. XXI, p. 539.

BAIRD, ROBERT, an American theologian and author; born in Fayette County, Pennsylvania, Oct. 6, 1798. He was educated at Jefferson College, Pennsylvania, and at Princeton Theological Seminary; spent several years in Europe, and was for some years corresponding secretary of the American and Foreign Christian Union. Among his works may be mentioned *The History of the Waldenses, Albigenses and Vaudois; The History of Temperance Societies;* and *The Religion of America.* He died at Yonkers, New York, March 15, 1863.

BAIRD, SPENCER FULLERTON, an American naturalist; born Feb. 3, 1823, at Reading, Pennsylvania; graduated at Dickinson College, Pennsylvania; where for 10 years he taught natural history. His first literary work of importance was a translation and revision of the *Iconographic Encyclopædia.* His writings on natural history were numerous and valuable. Among his best are *A Catalogue of North American Serpents; Mammals of North America,* and a *Review of North American Birds.* He was assistant secretary for 28 years under Joseph Henry (whom, in 1878, he succeeded) of the Smithsonian Institution. He was the organizer and first chief of the United States Commission of Fish and Fisheries. He was the recipient of many honors and medals from foreign societies and governments. He died at Wood's Holl, Massachusetts, Aug. 19, 1887.



SPENCER FULLERTON BAIRD.

BAKALAHARI, a Bechuana tribe of Africa, inhabiting that portion of the Kalahari desert lying between the Orange River and Lake Ngami. They are partly civilized, and their occupations are agriculture and goat-raising.

BAKE, JAN, a distinguished classical scholar; born at Leyden, Sept. 1, 1787; from 1817 to 1857 was professor of Greek and Roman literature in the university there; died March 26, 1864. He edited several classics, including works by Cicero, Longinus and others; was one of the editors of *Bibliotheca Critica Nova.*

BAKEL, an African town defended by a strong fort, in the east of the French colony of Senegal, on the left bank of the Senegal River. Population, 2,600.

BAKER, ABIJAH RICHARDSON, an American educator; born in Massachusetts, Aug. 30, 1805; educated at Amherst College; became a teacher in several Massachusetts towns; ordained a Congregationalist minister in Medford, and subsequently held charges at Lynn, Wellesley and Boston. He wrote a *School History of the United States,* and several devotional works. His wife, HARRIETTE NEWELL WOODS, is best known by her pen-name of "Madeline Leslie," under which she wrote upward of 150 books for juvenile readers; the daughter of the Rev. Leonard Woods, D.D., she was born in Andover, Massachusetts, in 1815; her husband died in Boston, April 30, 1876.

BAKER, SIR BENJAMIN, an English civil engineer, born near Bath, in the county of Somerset, in 1840. After a systematic and early training he entered the office of Sir John Fowler, the famous engineer, and assisted in many important enterprises, including the underground railway system in the British metropolis; he repaired the three celebrated bridges of Telford's construction, the Menai suspension-bridge, the Build-was iron bridge, and the Severn bridge near Gloucester. In 1877 Mr. Baker superintended the removal of Cleopatra's Needle to the Thames embankment, London, not only designing the tubular iron ship in which the obelisk was placed, but taking charge of the loading, disembarkation and erection. The building of the Firth of Forth bridge, in conjunction with Sir John Fowler, was his greatest achievement. Sir Benjamin Baker was for some time consulting engineer to the Hudson River Tunnel Company and other mammoth works. His technical and professional writings have been numerous and valuable. He wrote the article on TUNNELLING, in this ENCYCLOPÆDIA.

BAKER, EDWARD DICKENSON, an American lawyer, senator, and volunteer soldier; born in London, England, Feb. 24, 1811; was brought to America as a child; worked his own way to the bar at Springfield, Illinois; was member of Congress for two terms; served with distinction as colonel of volunteers through the Mexican War; went to California in 1851, where he gained fame for oratory and legal skill; removed to Oregon, and in 1860 was elected United States Senator;

he was killed at the head of his brigade of Union troops at Ball's Bluff, Virginia, Oct. 21, 1861.

BAKER, GEORGE AUGUSTUS, an American artist; born in New York in 1821. He received his first instruction in drawing from his father, an artist of considerable merit, and later studied at the National Academy of Design and in Europe. His earlier works were miniatures on ivory. Portraiture, especially of women and children, was his forte. He commanded high prices, and in this particular branch was at one time without a rival in America. His portraits are generally in private galleries throughout the country. He was elected a member of the National Academy in 1851, and died in New York, April 2, 1880.

BAKER, IRA OSBORN, an American technical educator; born at Linton, Indiana, Sept. 23, 1853; educated at the University of Illinois, and for some time assistant professor of civil engineering there; he was appointed professor in 1880, and has written several useful textbooks for engineers.

BAKER, JEHU, an American statesman and lawyer; born in Fayette County, Kentucky, Nov. 4, 1822; educated at McKendree College; studied medicine and then took up the legal profession; was a master in chancery of St. Clair County, Illinois, 1861–65; served in the Thirty-ninth, Fortieth, and Fiftieth Congresses, defeating William R. Morrison on the last occasion. He was United States minister to Venezuela, 1878–81 and 1882–85, acting also as consul-general toward the close of his mission there.

BAKER, JOHN GILBERT, an English botanist; born in Yorkshire, England, January 13, 1834; educated in the Friend's schools at Ackworth and York; for many years keeper of the herbarium and library at the Royal Botanical Gardens at Kew, England. Mr. Baker wrote authoritative treatises on British geographical botany, on ferns, on the flora of Brazil, Mauritius, Africa and Madagascar, and published several handbooks on botanical subjects. The article on FERNS, Vol. IX, pp. 100–107, in this ENCYCLOPÆDIA, is from his pen.

BAKER, LAFAYETTE C., detective, was born at Stafford, Genesee County, New York, Oct. 13, 1826, and died in Philadelphia, July 2, 1868. He was chief of the United States secret service; organized the pursuit of the assassin of President Lincoln, and was present at Booth's capture and death. He was made brigadier-general. His *History of the United States Secret Service* throws light on many events of the civil war.

BAKER, OSMON CLEANDER, an American Methodist bishop; born in Marlow, New Hampshire, July 30, 1812; educated at the Connecticut Wesleyan University; a teacher in the Vermont Wesleyan Seminary at Newbury in 1834, and its principal, 1839–44. He took a leading part in founding Methodist theological schools; was chosen a bishop of the Methodist Episcopal Church in 1852. His treatise *On the Discipline of the Methodist Episcopal Church* still has authority in his denomination. Died at Concord, New Hampshire, Dec. 20, 1871.

BAKER, SIR SAMUEL WHITE, an explorer and author; born in London, England, June 8, 1821. He first became known to the public by the establishment of a mountain colony in Ceylon, at Newera Ellia, in 1847, of which an interesting account is given in his *Eight Years' Wanderings in Ceylon.* In 1861 he organized at his own cost and conducted an expedition for the discovery of the source of the Nile. In this expedition he was accompanied by his wife. Having reached the junction of the Atbara with the Nile, he explored the basin of the Blue Nile, and made his way to Khartum, where he organized a party to explore the course of the White Nile. He arrived at Gondokoro in the spring of 1863, where he met Captains Speke and Grant, who had started from Zanzibar on a similar quest, and reported having reached the lake Victoria Nyanza, which they believed to be the source of the great river. Baker, without either interpreter or guide, set out from Gondokoro, and a year afterwards sighted the waters of a great lake, which he called the Albert Nyanza. The Royal Geographical Society awarded him the Victoria gold medal, and the Queen conferred upon him the honor of knighthood. He undertook a successful expedition into Central Africa for the suppression of the slave trade, on behalf of the khedive, in 1869 and in 1879 was sent by the British government to investigate the resources of Cyprus. His adventures he recounted in a dozen books, some of which were of the utmost geographical value, as *The Albert Nyanza* and *The Nile Tributaries of Abyssinia*, while others were predominantly col ored with huntsman's craft, as *The Rifle and Hound in Ceylon* and *Wild Beasts and their Ways.*



SIR SAMUEL WHITE BAKER.

BAKER, VALENTINE, a British cavalry officer; victim of circumstances; brother of Sir Samuel Baker. He entered the English army in 1848 and distinguished himself in the Kaffir war of 1852 and in the Crimean War. In 1875 he was accused of assaulting a young woman traveling in a railroad carriage, was convicted by popular clamor, fined and imprisoned. Dismissed from the English army, he became pasha and major-general in the army of Turkey. In the war with Russia, Baker Pasha won new distinction as a brave and able commander. In 1883 he was sent to Egypt to avenge the defeat, in the Soudan, of Hicks Pasha, and was badly defeated at Tokar, Feb. 5, 1884. The sympathy of his countrymen was aroused, even *Punch* printing a poetic appeal from the English army for the restoration to rank of "The Man on the Old Gray Horse." Baker died unforgiven, at Tel-el-Kebir, Egypt, Nov. 17, 1887.

BAKER, WILLIAM, an English educator, born

at Reigate, Surrey, Dec. 1841; educated at Oxford; prebendary of St. Paul's Cathedral, London, in 1880; fellow of St. John's College, Oxford, 1860–70; head master of the Merchant Taylors' School, London, 1870; author of devotional books for youth, and of a treatise on the history and dogma of the Church of England.

BAKER, WILLIAM BLISS, an American landscape painter; born in New York in 1859. He studied under Albert Bierstadt, M. F. de Haas, and at the National Academy, New York, where he won several prizes. Among his best works are *Woodland Brook; Pleasant Day at Lake George;* and *Under the Apple Trees,*—canvases in which careful elaboration of details is combined with a fine sense of general effect. He died in Ballston, New York, in 1889.

BAKER, WILLIAM MUMFORD, an American clergyman and author; born in Washington, District of Columbia, June 27, 1825; died in Boston, Aug. 20, 1883. His principal work, *Inside: A Chronicle of Secession,* was published under the assumed name of G. F. Harrington. He was a pastor in Texas, Ohio and Massachusetts, and produced a number of popular tales. His last work, *Ten Theophanies* (1883), has autobiographical interest concerning his religious experience.

BAKER CITY, the capital of Baker County, northeastern Oregon. It is located on the east and south forks of the Powder River and on the lines of the Oregon Railroad and Navigation Company, and of the Sumter Valley railroad. The country around is fertile and also metalliferous. Population 1890, 2,604.

BAKER ISLAND OR NEW NANTUCKET, a small coral island in the North Pacific Ocean, in lat. 13′ N., long. 176° 29′ E., formerly the site of vast guano deposits. The deposits have been all removed by the working of the American Guano Company. The island is now uninhabited, is without water and devoid of vegetation.

BAKER, MOUNT, an active volcano in the northwest of Washington state, in the Cascade Range, a continuation of the Sierra Nevada, 20 miles from the Canadian frontier. It was in eruption in 1880. Its height is 11,100 feet.

BAKERSFIELD, capital of Kern County, in southern central California; situated on the Kern River, about 100 miles N.W. of Los Angeles and on the Southern Pacific railroad. It is the center of many acres under fruit-culture. Population 1890, 2,626.

BAKEWELL, ROBERT, an English agriculturist; born about 1725; died in 1795. He is noted for his work in improving the breeds of cattle and sheep. See AGRICULTURE, Vol. I, pp. 302, 391.

BAKHTEGAN, LAKE, a body of water in Persia, 50 miles E. of Shiraz, 60 miles long by 8 wide. It has no outlet, but the river Bundemir enters its western end. A salt marsh surrounds it, and large quantities of salt are obtained from the lake.

BAKING-POWDER is a combination of cream of tartar or tartaric acid, soda and starch. Cream of tartar is obtained from the residuum forming in the bottom of casks in which wine has stood for some time. Soda is used in the form of the anhydrous powder, carbonate of sodium, and the starch is added for the purpose of absorbing moisture and preventing chemical combination before the powder is used. Carbonate of ammonia may displace the soda. When used, the dry powder is thoroughly mixed with flour; then water is added, and the two chemicals combine to form a sodium or potassium tartrate, giving off in the process carbonic-acid gas. This gas permeates the dough, and in baking, the cavity walls that contain the gas become hard and fixed, producing the porosity of bread known as lightness. Introduced about forty years ago, baking-powder soon came into general use, and has almost entirely superseded the primitive form of making bread, biscuit, cakes, etc., by the use of yeast, sour milk, and soda or like expedients. Baking-powder is one of the most extensively advertised of all culinary articles, and so sharp has competition been between rival manufacturers that adulteration with alum, superphosphates and other deleterious substances has been carried to such an extent as to call for legislative interference in many of the states. It is now used in all parts of the world, and inferior or objectionable brands are made by other formulas, the essential part of all being the effervescing union of an acid and an alkali not injurious to health. One of the leading manufacturers of the United States sold his formula, good-will and trade-mark for one million dollars, and retained an interest in the company formed for its manufacture.

BAKONY-WALD (Forest of Bakony), a densely wooded mountain range of Hungary, south of the Danube, dividing the great and little Hungarian plains. It is 56 miles long, 23 miles wide and of about 2,000 feet elevation. Immense herds of swine are annually driven hither to feed upon the mast of the forest.

BAKTSHI-SERAI (*Turkish,* "garden palace"), a town in the Russian government of Taurida; the residence of the ancient princes or khans of the Crimea; inhabited chiefly by tribesmen of that race; stands in a deep limestone valley, 15 miles by rail S.W. of the present capital, Simferopol. The population in 1891 was 10,528. The palace (1519) of the khans has been completely restored, by the Russian government, in the oriental style.

BAKU. For earlier matter as to this town, see Vol. III, p. 258. Since 1883 it has been connected by rail with Tiflis, and so with Poti and Batûm, on the Black Sea, 561 miles distant; and since 1887, by the North Caucasus railway, with Novorossiak, on the Black Sea. The whole soil around Baku is impregnated with petroleum, the staple of its industry. Of the 500 petroleum-wells at Baku, most are situated on the Balakhani Peninsula, eight or nine miles to the north of the town. Lines of pipe carry the oil into the "black town" of Baku, with its smoky refineries, its black and greasy buildings and pools of oil-refuse. One well, opened in September, 1886, flowed at a daily rate of 11,000 tuns, and submerged a large area. Another spouting well, in March, 1887, threw oil

to a height of 350 feet, and after forming an extensive petroleum lake, forced its way into the sea. The production of crude petroleum in 1885 exceeded 420,000,000 gallons, and 120 firms have now oil-refineries there. Destructive fires have occasionally occurred, as in 1887, when over 14,000 tuns of petroleum in reservoirs burned furiously for five days. Oil is now transported by steamers on the Caspian and its confluent rivers, and is largely used to generate steam on railways and vessels. The waste is used as fuel in southeast Russia. A pipe-line 600 miles long now conveys oil from Baku to the Black Sea, and the profusion of the supply curtails the American oil trade in Europe, Baku producing, in 1893, over 33,000,000 barrels. Cotton, silk, opium, saffron and salt are among the exports of Baku.

BAKUNIN, MICHAEL, a noted Russian Nihilist. See SOCIALISM, Vol. XXII, p. 216.

BALA BEDS, a local deposit occurring in the neighborhood of Bala, North Wales. See GEOLOGY, Vol. X, p. 332.

BALACHONG, a Chinese condiment eaten with rice. It is made of shrimps or small fish pulverized with spices and salt, after which the mixture is dried.

BALÆNICEPS ("whale-headed"), a grallatorial bird of monstrous size inhabiting the region of the Upper Nile. See STORK, Vol. XXII, p. 577.

BALAGUER, VICTOR, a Spanish historian and poet; born in Barcelona, Spain, Dec. 11, 1824; noted for his researches into the early literature and antiquities of Catalonia; was successively archivist at Barcelona, professor of history in the University there, and in 1886 minister of the colonies in Sagasta's cabinet. His *History of Catalonia* (1878) and *Literary and Political History of the Troubadours* (6 vols., 1878–80) are works of merit and lasting value.

BALAHISSAR, a village in Asia Minor, in the southwest of the Angora province. It was here that the ancient Pessinus was situated, and the modern village contains the ruins of beautiful buildings, many of which have crumbled away, leaving their finely carved marble columns. Among the ruins are a castle, a circus, a fairly well preserved theater, and the magnificent temple of Cybele, this deity being the patron goddess of the ancient city.

BALAKLAVA OR BALACLAVA, a small port on the Black Sea, in the Crimea, Russia. The inhabitants are chiefly Greeks. The town was anciently quite magnificent, as is shown by the ruins of mosques, etc. Homer has correctly described the bay, and this is supposed to be the port of the Læstrigonians, where Ulysses landed. The place is now famed as having been the scene of a cavalry charge on the Russians by the English, Oct. 25, 1854, known as the "Charge of Light Brigade." (See CARDIGAN, Vol. V, p. 95.) Through the inefficiency of officials in the Crimean campaign, British soldiers died of hunger and cold here, while ships lying in the harbor were freighted with the necessary supplies.

BALANCE OF TRADE, the difference between the value of exports and imports in any country. See POLITICAL ECONOMY, Vol. XIX, p. 354; COMMERCE, Vol. VI, p. 204.

BALANOGLOSSUS, a genus of animals belonging to the class *Enteropneusta*. Formerly all members of the class were placed in this genus. Their position in systems of classification is still a matter of great dispute. Certain characters ally them to vertebrates. Other characters suggest affinities to the worms. The latest author, Spengel, claims that they are distantly allied to the annelids, and rejects much of their supposed vertebrate relationship. For anatomical description, see VERTEBRATA, Vol. XXIV, pp. 179, 187.

BALANUS. See ACORN SHELLS, in these Supplements.

BALAS–RUBY OR SPINEL. See MINERALOGY, Vol. XVI, p. 386.

BALATON, LAKE (Ger. *Plattensee*), the largest lake in Hungary. See HUNGARY, Vol. XII, p. 362.

BALBI, GASPARO, a Venetian merchant of the sixteenth century. He was the first traveler who has left an account of India beyond the Ganges. Business often called him to Aleppo, and thence, on one occasion, he made a visit to India, which lasted several years. After his return he published, in 1590, the result of his travels in a volume entitled *Viaggio nelle Indie Orientali.*

BALBUENA, BERNARDO DE, a Spanish poet, only three of whose poems remain, *La Grandeza Mejicana; El Siglo de Oro;* and the epic poem *El Bernardo.* He was born at Valdepeñas in 1568, and died at Porto Rico in 1627. He was bishop of the-last mentioned place.

BALBUS, LUCIUS CORNELIUS, surnamed Major; born at Cadiz (Gades). He was a Roman officer who served under Cæsar in Spain in 61 B.C., and was chosen consul in 40 B.C. He left a diary recounting the events of the life of Julius Cæsar.

BALCH, GEORGE B., an American naval officer; born in Tennessee, Jan. 3, 1821; entered the navy in 1837; was many years on foreign service, and participated in the attack on Vera Cruz. He served in the South Atlantic squadron during the Civil War, and commanded the *Pawnee.* He became commodore in August, 1872, rear-admiral in June, 1878, and was superintendent of the Naval Academy 1879–81. In January, 1883, he was placed on the retired list.

BALCONY (It. *balcone*), a projecting gallery in front of a window, or of several windows, with a balustrade or parapet before it, and supported by consoles or brackets fixed in the wall, or by pillars resting on the ground below. The balcony was unknown in Greek and Roman architecture, and is probably an Italian contrivance, as the earliest examples of it occur in Italy, to the climate of which country it is peculiarly adapted.

BALDACHIN (It. *baldacchino*), a tentlike or umbrella-shaped canopy overshadowing the altars, chairs and portals of the early cathedrals, and sometimes placed above thrones, generally sustained by pillars. One of the most celebrated is in St. Peter's at Rome. The Romans, in the time of Constantine,

suspended the sacramental vessel by a cord fastened to the center of the interior of this canopy, which, from its cuplike appearance, they called *ciboria*. The baldachin originated in eastern countries, where there was still another form, a square-shaped structure, which was borne above the head of a priest, who carried the host, or above the heads of monarchs, as significant of greatness. The employment of these structures in Anglican churches was, in 1873, declared illegal, in consequence of a suggestion that one be used in the building of St. Barnabas's Church. The baldachin became well known in Italy through the medium of the Crusades. See CIBORIUM, Vol. II, p. 462; UMBRELLA, Vol. XXIII, p. 723.

BALD EAGLE OR WHITE-HEADED EAGLE (*Haliaëtus leucocephalus*), so called from the snow-white color of its neck and head. This species is very large, being from seven to eight feet from tip to tip of the wings. It is very widely spread over the entire continent. Its food is fish, small animals, or any poultry it can get. This bird has been adopted as the national emblem of America. See EAGLE, Vol. VII, p. 590.

BALDISSERA, VICTOR, an Italian general; born of poor parents, in 1839, at Udine, in Friuli, Italy. He is said to have been picked up on the streets by the Bishop of Udine and educated at the expense of the Empress Marianne of Austria and at the military academy at Wiener-Neustadt. In 1859 he fought for the Austrians against his own countrymen, and won two gold medals for valor and bravery under fire. In 1866 he left the Austrians with the rank of major, and was appointed to the same rank in the Bersaglieri of Milan. He went to Africa in 1887 as a general, and became the governor of Eritrea. Dissatisfied with the duplicity of the Treaty of Ucciali, he returned to Italy until the disaster of Adowah (see ABYSSINIA, in these Supplements) vindicated his policy, and caused the king to persuade him to return to Africa in supreme command. Taciturn and a thorough tactician, he has been termed the Italian Von Moltke.

BALDMONEY, a name applied to an umbelliferous plant (*Meum athamanticum*) of Europe, used as a carminative medicine; also commonly applied to several species of gentian.

BALDNESS (*Alopecia*), an entire or partial loss or absence of hair from the head. See SKIN DISEASES, Vol. XXII, p. 121.

BALDPATE, American widgeon, the *Mareca americana*. See WIGEON, Vol. XXIV, p. 561.

BALDRIC OR BAUDRICK, a band or sash worn over the right shoulder, and brought down obliquely under the left arm in such a way as to sustain a sword. See COSTUME, Vol. VI, p. 474.

BALDUNG, HANS. See GRÜN, HANS BALDUNG, Vol. XI, p. 224.

BALDWIN, a city of Douglas County, northeastern Kansas, situated on a division of the Santa Fé railroad, 15 miles S. of Lawrence. It is the site of Baker University, a Methodist college founded in 1858, and is the center of an agricultural district. Population 1895, 1,135.

BALDWIN, the name of four Crusader kings of Jerusalem (1100–86). See CRUSADES, Vol. VI, p. 627.

BALDWIN I AND BALDWIN II, Latin emperors of Constantinople. See CRUSADES, Vol. VI, pp. 629, 630.

BALDWIN, ABRAHAM, born in Guilford, Connecticut, Nov. 6, 1754; died in Washington, District of Columbia, March 4, 1807. He graduated at Yale; was made chaplain in the army; studied law, and was elected to the Georgia legislature; father of the act founding the University of Georgia; next a delegate to the Continental Congress for three years; a member of the Federal constitutional convention, and a representative in Congress for 18 years.

BALDWIN, CHARLES H., an American naval officer; born in New York City, Sept. 3, 1822, entered the navy in 1839. In the Mexican War he was engaged in several land attacks near Mazatlan, on the west coast. He was in command of a steamer in the mortar flotilla under Farragut at the passage of the forts below New Orleans in 1862, and at the bombardment of Vicksburg in the same year; was made captain in 1869; in command of the Mediterranean squadron, with the rank of rear-admiral, from 1883 until his retirement in the following year. He died in New York, Nov. 17, 1888.

BALDWIN, HENRY PORTER, an American statesman; born at Coventry, Rhode Island, Feb. 22, 1814; went to Detroit in his early youth; governor of Michigan in 1869–73, and United States Senator in 1879–81. He took a prominent part in advancing the interests and missions of the Protestant Episcopal Church. Died at Detroit, Michigan, Dec. 31, 1892.

BALDWIN, JAMES MARK, an American psychologist; born in Columbia, South Carolina, Jan. 12, 1861; educated at Princeton, Leipsic, and Berlin; instructor in modern languages at Princeton in 1886; professor of philosophy in Lake Forest University, 1887–89, and in Toronto University, 1889–93. He was appointed professor of psychology at Princeton in 1893; edited *The Psychological Review*, and has written several standard text-books on psychology.

BALDWIN, MATTHIAS WILLIAM, an American inventor and manufacturer; born at Elizabethtown, New Jersey, Dec. 10, 1795; he had remarkable inventive ingenuity, devising new processes of metallurgy and bookbinding. He then became interested in the construction of engines, and having seen an imported locomotive, he built the "Ironsides" in 1832, which was the first commercially good locomotive built in the United States, and was exhibited at the Columbian Exposition in Chicago in 1893. He had taken up his residence in Philadelphia as a lad, in the northern part of which city he had served as a jeweler's apprentice, and his success as a constructor of locomotives brought him orders that resulted in his founding one of the largest plants for building them in the world, an organization still known as the Baldwin Locomotive Works. His own improvements kept his mechanisms in the van, and he grew very rich for his times. His philanthropy and benignity were inexhaustible, and for a generation after his death his house on Chestnut Street preserved the conservatory he had built, so that passers by could enjoy the flowers therein. His

generosity was simple and yet munificent, and he died, venerated wherever known, on Sept. 7, 1866.

BALDWIN, ROBERT, a Canadian lawyer and statesman, the father of the Canadian reform party; born in Toronto, May 12, 1804. He was elected a member of the Upper Canada (Ontario) assembly in 1829, and took part in a futile mission to London in 1836, in the interests of home rule for Canada. Chosen an executive councilor in 1836, solicitor-general of the colony in 1840 and premier and attorney-general in 1842. He retired from active political life in 1851, and died in Toronto, Dec. 9, 1858.

BALDWIN, ROGER SHERMAN, an American jurist and statesman; born in New Haven, Connecticut, Jan. 4, 1793. He was associated with John Quincy Adams in conducting the famous Amistad case, involving the surrender of a slave-trader, in the hands of a revolted "cargo" of men, to Spain. He was successively assemblyman, senator and governor of his native state. In 1847 he went to the United States Senate for eight years. He was a supporter of Lincoln's administration, and died in New Haven Haven, Feb. 19, 1863.

BALDWIN, STEPHEN LIVINGSTON, an American organizer of the Methodist Episcopal missions, was born at Somerville, New Jersey, in 1835. After an education and pastorate at Newark, New Jersey, he was for some time superintendent of the Foochow mission in China. He translated portions of the Scriptures into a Chinese dialect and wrote some articles on Chinese religions. Was for some time secretary of the Missionary Society of the Methodist Episcopal Church.

BALDWINSVILLE, a village in Lysander and Van Buren townships, Onondaga County, in the central part of the state of New York. It is situate 13 miles N.W. of Syracuse, on the Seneca River, and is traversed by the Delaware, Lackawanna and Western railroad. It is a manufacturing center, with ample water-power from the Seneca River, and is also the center of an agricultural and tobacco-raising region. Population 1890, 3,040.

BALEARIC CRANE (*Balearica pavonina*), the beautiful crowned or crested crane, found in northwest Africa. This bird is characterized by the crest on its head, its brilliant scarlet cheeks, and bluish slate-colored plumage. It is a very swift runner, and has a peculiar, harsh voice. Many are tamed and kept as domestic pets.

BALÉCHOU, JEAN JOSEPH NICOLAS, a noted French engraver; born at Arles in 1715. His life-size portrait of Augustus, King of Poland, was his finest work. The first burinist of his time, his pictures are brilliant and bold, but are marred by defective drawing and neglect of detail. He died in Avignon, Aug. 18, 1764.

BALEEN, the whalebone of commerce, obtained from the mouth of the right whale. See WHALE, Vol. XXIV, p. 523.

BALESTIER, WOLCOTT, an American novelist; born at Rochester, New York, Dec. 16, 1861. Educated at Cornell University, he obtained the material for stories of frontier life contributed to the magazines from a residence in Colorado and Mexico. He was for some years allied with the firm of Lovell and Company, publishers, in New York, proceeding to England as their agent and literary adviser in 1888. Here he met and became the fast friend of Rudyard Kipling, who subsequently married his sister. The two collaborated in *The Naulakha*, an Indo-American story of love and adventure, wherein Kipling's virile diction and Balestier's delicacy of touch are in forceful contrast to each other. His novel, *Benefits Forgot*, was published posthumously by the Century Company in 1892. He died in Dresden, Saxony, Dec. 6, 1891. One of Kipling's finest sets of verses is a tribute to Balestier's memory.

BALESTRA, ANTONIO, an Italian painter; born at Verona in 1666; one of the last talented exponents of the Venetian school; a pupil of Belucci and Carlo Maratti. His *Defeat of the Giants*, *Saint Theresa*, *The Virgin*, and *Saints Cosmas and Damian* are objects of interest in the churches of his native land. He died in Verona, April 21, 1740.

BALFOUR, ARTHUR JAMES, born July 25, 1848, is the eldest son of James M. Balfour and Lady Blanche Gascoigne Cecil, second daughter of the second Marquis of Salisbury. Educated at Eton and Trinity College, Cambridge, he entered Parliament in 1874 as Conservative member for Hertford, and from 1878 to 1880 was private secretary to his uncle, Lord Salisbury, whom he accompanied to the Berlin Congress. For a while an unattached member of Lord Randolph Churchill's "Fourth Party," he led off the attack on the "Kilmainham Treaty" (1882); negotiated with Lord Hartington the franchise compromise (1884); was returned for East Manchester (1885); was appointed president of the local government board in Lord Salisbury's first administration (1885); secretary for Scotland (1886) and chief secretary for Ireland (1887). In this last most difficult position he showed himself cool, clear-sighted, quick to think, speak and act. He carried the Crimes Act through the House, and many other beneficial measures, becoming, on the death of W. H. Smith, First Lord of the Treasury and leader of the House. On the downfall of the Salisbury government he went out of office, October, 1892; resumed his old positions on the return of his uncle to power in 1895. His *Defense of Philosophic Doubt* (1879), *Essays and Addresses* (1893), and *The Foundations of Belief* (1895), have been received with much praise, as a practical man's argument for traditional religion.



ARTHUR JAMES BALFOUR.

BALFOUR, FRANCIS MAITLAND, brother of Arthur James, a British biologist, was born at Edinburgh in 1851, and on July 19, 1882, he perished in an attempt to ascend the Aiguille Blanche, one of the spurs of Mont Blanc. He was educated at Harrow and at Trinity College, Cambridge, where he became a professor of morphology, and at 30 years of age published a valuable treatise on the fast-

changing subject of *Comparative Embryology*. See EMBRYOLOGY, Vol. VIII, p. 169.

BALFOUR, ISAAC BAYLEY, an English botanist; born in Edinburgh, Scotland, in 1853; educated at Edinburgh, Strassburg, and Würzburg universities; accompanied scientific expeditions to Rodriguez and Socotra; appointed professor of botany at Glasgow University in 1879, at Oxford in 1884, and since that date professor of botany at Edinburgh; keeper of the Royal Botanic Gardens, and Queen's Botanist for Scotland. His works on his favorite science have been numerous and valuable.

BALFOUR, JOHN HUTTON, an English botanist and physician; born in Edinburgh, Sept. 15, 1808; died there, Feb. 11, 1884. He was professor of botany at Glasgow and afterward in Edinburgh; published a *Manual of Botany* and a *Class-Book of Botany*, and contributed the article on BOTANY to this ENCYCLOPÆDIA, Vol. IV, pp. 79–163.

BALFOUR, WALTER, born in Scotland in 1777 and died Jan. 3, 1852. He was brought up a Presbyterian, but became a Baptist, and later a Universalist. He wrote several books, among which were *Inquiries Concerning the Devil; Scriptural Import of the Words Translated Hell;* and *The State of the Dead.*

BALIOL OR BALLIOL, EDWARD DE, a son of King John Baliol, and heir to the Scottish throne. He was crowned at Scone in 1332, after an invasion of the country, but retained the throne only three months. He died in 1363. See SCOTLAND, Vol. XXI, p. 489.

BALIOL, JOHN DE, king of Scotland, son of Sir John de Baliol, after whom the Balliol College at Oxford was named. Born in 1249; died in 1315. See SCOTLAND, Vol. XXI, pp. 486, 487.

BALISTA OR BALLISTA, a military engine in use before the invention of gunpowder. The balista, which was in the form of a crossbow, propelled large and heavy missiles, chiefly through the reaction of a tightly twisted rope of hemp, flax, catgut, sinew or hair, or else by a violent movement of levers. It required a good deal of mechanism to bring about the propulsive force. The early chroniclers tell of a balista which threw a stone weighing 360 pounds.

BALISTES, a genus of fishes. See FILE-FISH, Vol. IX, p. 161.

BALKAN PENINSULA, a term used in a general and wide sense to describe the southeasternmost peninsula of Europe, including the regions south of the Save and Danube. Thus used, it includes Dalmatia, parts of Croatia and Küstenland, Bosnia, Herzegovina, Montenegro, Servia, Bulgaria, part of Roumania, European Turkey and Greece. In a narrower sense, it is limited to the area of the Balkan states.

BALKASH ("large lake"), a lake of Asiatic Russia, having no visible outlet. See SEMIRYETSCHENSK, Vol. XXI, p. 640.

BALL, GAME OF, a favorite pastime of all ages, in varying methods of playing. The Romans called it *pila*. The Greeks played it, and the early Aztec civilization of the American continent indulged in this pastime. In the middle ages the game was fashionable in the courts of Continental rulers. From this sprang tennis and all modern games of ball. See CRICKET, Vol. VI, p. 578; GOLF, Vol. X, p. 765; TENNIS, Vol. XXIII, p. 179; and see BASEBALL, in these Supplements.

BALL, SIR ROBERT STAWELL, an English astronomer; born in Dublin, July 1, 1840. He studied at Trinity College, Dublin, and in 1865 Lord Rosse engaged him as his astronomer at Parsonstown. He became professor of applied mathematics and mechanics at the Royal Irish College of Science in 1873; the following year he was made astronomer royal for Ireland, and Andrews professor of astronomy at Dublin University. He was knighted in 1886. His *Story of the Heavens* is very popular, and he has written much to familiarize the masses with the science of astronomy.

BALL, THOMAS, an American sculptor; born at Charlestown, Massachusetts, June 3, 1819, took up modeling in 1852, having already won attention by singing in oratorios. His voice was a powerful and rich bass. He made a miniature bust of *Jenny Lind;* another of *Daniel Webster;* and also a life-size statue of the latter, which is in New York. After studying in Florence for some years he executed an equestrian statue of *Washington*, now in Boston Public Garden. His later works are a statue of *Forrest* as Coriolanus, of heroic size; *Eve;* a statuette of *Lincoln;* a bust of *Edward Everett;* statues of *Governor Andrew* of Massachusetts, *Webster*, *Sumner*, *Josiah Quincy* and the group called *Emancipation*, the original of which is in Washington, District of Columbia, and a replica in Boston. His statue of *Webster*, in Central Park, New York, is his noblest work. It was placed there at an expense of $60,000, through the munificence of a New York merchant. His *Three Score Years and Ten* (1891) is a volume of the garrulous recollections of a well-loved old man who had seen much with a sunny spirit.



THOMAS BALL.

BALL, VALENTINE, a noted English industrial geologist; born in Dublin, July 14, 1843; graduated at the University of Dublin; director of the Dublin Museum of Science and Art; was for 17 years prominently identified with the geological survey of India, where he made many explorations. His discovery of coal-fields in central India did much to develop the industries of a sparsely settled tract and to induce the building of the direct railroad between Calcutta and Bombay. He also made explorations in Afghanistan, Beluchistan and the Andaman and Nicobar islands. His *Diamonds, Coal and Gold of India* (1881) is a standard geological work. He was a fellow of the Royal Society, and died June 15, 1895.

BALLABGAHR, an Indian town situated in the Punjab, in the native state of Ballabgahr, of which it was once the capital. It carries on a grain trade,

and has several temples and a palace. It is 21 miles S. of Delhi. Population 1890, 7,000.

BALLACHULISH, a village of Scotland, 16½ miles S. of Fort William, in Argyllshire, on the southern shore of the salt-water Loch Leven; noted for its extensive quarries of blue slate, which have been worked since 1760, and give employment to nearly 600 men. The product of these quarries now averages annually about 17,000,000 roofing-slates, weighing some 30,000 tons. Population, about 1,000.

BALLADE, a term applied to a poem consisting of one or more stanzas of seven or eight lines, each ending with the same refrain, and usually an envoy, as Chaucer's *Compleynt of Venus* and *To His Purse.* The foregoing is the strict application of the term. It is now frequently, and somewhat loosely, used as referring to any poem divided into stanzas of equal length. The ballade was a favorite form of poetry with Villon and many of the older French poets, and has been revived and again brought into fashion by De Banville, Swinburne, Andrew Lang, Austin Dobson and other recent versifiers. The *ballade royal* contained ten-lined stanzas, and was so named because James I of Scotland wrote in such a measure. In German music a ballade is a long descriptive song, and is sometimes developed into close resemblance to a cantata.

BALLANTINE, James, poet and artist; born at Edinburgh in 1808; died in 1877. He learned the trade of a house-painter, but studied drawing under Sir William Allen, and turned his attention to staining glass, taking a prominent part in the revival of that art, and was employed to furnish the House of Lords with windows. His work on *Glass-Staining*, published in 1845, was translated into German. Among his works are *One Hundred Songs, with Music* (1865); *Life of David Roberts, R.A.* (1866); *Lilias Lee* (1871); and numerous poems written from 1856 to 1865. He also wrote two volumes in prose, *The Gaberlunzie's Wallet* (1843) and *Miller of Deanhaugh*, in which are contained some of his best songs and ballads.

BALLANTINE, William (1812–1887), an English sergeant at law, the son of the magistrate at the Thames police court. He was mainly employed in defenses in criminal cases, the most important being the Tichborne case, the defense of the Guicowar of Baroda, and the Muller murder trial. He wrote *Experiences of a Barrister's Life* (1882), and an account of his voyage to America, called *The Old World and the New* (1884).

BALLANTINE, William Gay, an American Congregational minister; born at Washington, District of Columbia, Dec. 7, 1848; graduated at Marietta College and took the course at Union Theological Seminary, New York; was successively professor at Ripon College, at the Indiana University and at Oberlin Theological Seminary; in 1879 became the president of Oberlin College.

BALLANTRAE, a Scotch fishing-village in the southern part of Ayrshire, at the mouth of the Stinchar. It has considerable occupation in fish-curing, and carries on the chief trade of the southwest fishery district. Population, 742.

BALLANTYNE, James. See Scott, Sir Walter, Vol. XXI, pp. 548–550.

BALLANTYNE, John, a Scotch artist, was born at Kelso in 1815. He was educated in the Edinburgh Academy, and in 1832 went to London and studied several years at the Royal Academy, of which he became an associate. He also studied in Paris and Rome. He was prolific and successful as a *genre* painter, but produced few historical works.

BALLANTYNE, Robert Michael, a Scotch author; born at Edinburgh in 1825. His stories of adventure, often founded on his own experience, and adapted to boys, were sensible and popular. He adopted a literary career in 1856, writing tales concerning incidents that took place during his residence among the Indians and fur-traders of Rupert's Land. His first work (1848) was an account of his six years' experience in the territories of the Hudson Bay Company (1841–47). In 1887 he had issued 74 volumes, of which 62 were separate tales. He died in Rome, Feb. 8, 1894.

BALLENY ISLANDS, a group of five small volcanic islands in the Antarctic Ocean, lat. 66° 44′ S., long. 163° 11′ E., discovered by Captain John Balleny in 1839. They are utilized as whaling-stations. One contains a lofty mountain.

BALLESTREM DI CASTELLENGO, Euphémie, Countess of, a German novelist; born at Ratibor, in Upper Silesia, Aug. 18, 1859. In 1872 she became noted by contributions to various periodicals. Among her novels the most popular are *Lady Melusine* (1878); *The Second Wife's Inheritance* (1878); *Drops in the Ocean* (1880); and a drama entitled *The Comet* (1880). She also edited a volume of English and German anthology, and a series of biographical essays upon the sovereigns of the world, entitled *In the Shadow of the Throne* (1882).

BALL-FLOWER, an ornament peculiar to Gothic architecture. See Architecture, Vol. II, p. 460.

BALLINGER, a town of central Texas, capital of Runnels County, situated on the Colorado River, 165 miles N.W. of Austin. It is a station on the Gulf, Colorado and Santa Fé railroad, and is the center of a wool-growing and cattle-raising district. Population 1896, 1,400.

BALLINROBE, a small town on the Robe River, in the county of Mayo, Ireland. It is situated 17 miles S.S.E. of Castlebar. Population, 2,286. See Mayo, Vol. XV, p. 650.

BALLIOL COLLEGE. See Oxford University, Vol. XVIII, p. 96.

BALLISTI. See Gunpowders, in these Supplements.

BALLISTICS. The properties connected with the flight of projectiles are not all fully understood, despite the intelligent study devoted to the subject. It is known that bullets drift to the right when the rifling turns that way, and *vice versa;* also, that the air produces a sort of buoying action on the projectile, tending to increase its range, because of a supporting influence like that exhibited in the aëroplane. Other influences besides gravity are suspected, but not definitely proved.

Among recent improved instruments for the study of ballistics, Francis Bashforth's chronograph is

worthy of note. It records fractions of a second into five decimals. It has a brass cylinder, with fly-wheel, both mounted on a vertical axis. A paper is placed around the cylinder, and two markers draw spiral lines around it. When a projectile passes through a screen, an electrical impulse is sent to the chronograph, and recorded by a jerk in the spiral lines. A clock is attached to aid in the computations.

Lieut. G. A. Squier and Prof. A. C. Crehore obtained a medal from the Franklin Institute of Philadelphia, for an apparatus which they developed at the United States Artillery School at Fortress Monroe, Virginia. With this they succeeded in measuring the speed of a projectile at five-foot intervals from the muzzle of the gun to 45 feet, and demonstrated that the velocity actually increases after the projectile has left the muzzle. The success of their apparatus was attained by the use of a photographic-plate shutter whose action is practically instantaneous. A sensitive photographic plate is made to rotate at a certain speed in a dark box, to which light is admitted when an electrical impulse is received from the screen through which the projectile has passed. Instead of using a material shutter to admit this light, the inventors made use of the principle of the Nicol prisms, as used in the polariscope. They found liquid carbon bisulphid a proper transparent medium for rotating the plane of polarization, and placed it between the polarizer and analyzer, making it subject to the control of the electric current. A coil of wire is wound around the glass tube to produce a magnetic field in the carbon bisulphid. The rotation of the plane of polarization is produced where the prisms are crossed, so that no light emerges from the analyzer, it being caused by a current sent through the coil on the tube. This produces the same result as rotating the polarizer, and a light comes from the analyzer. As soon as the electric current is broken, the medium has no more rotary power, hence darkness results. By this means a result similar to the lifting of a shutter over the sensitized plate is obtained, but without the loss of time incident to mechanically moving a shutter.

BALLOON-FISH, the sea hedgehog. See GLOBEFISH, Vol. X, p. 685.

BALLOT SYSTEM, AUSTRALIAN. This system was suggested by Hon. Francis S. Dutton, a member of the legislature of South Australia, in 1851, and was enacted in legal form during the session of 1857–58. It was gradually extended and improved, until in 1876 the system was made to cover almost all elections held in South Australia, and in 1887 it was extended throughout the Australian colonies. The first European country to adopt this system was England in 1870, next Belgium, in 1877, after which the grand duchy of Luxembourg copied the Belgian act, and in 1882 Italy formally announced its adoption by royal decree. The system gained a footing in Canada by degrees, the first introduction being in British Columbia in 1873, and in 1886, when Manitoba incorporated the law into its statutes, the entire Dominion was included. The first effort at the introduction of the system into the United States was in Michigan in 1885, but it failed of passage, as it did again in 1887. In Kentucky the system, with some modifications, and applying only to the city of Louisville, was adopted by the legislature in 1888, and in the same year a modified form of it was adopted by the legislature of New York, but was vetoed by the governor, as it was again in 1889. In 1890 a law, from which the features objected to by the governor had been eliminated, was enacted in that state. In 1888 Massachusetts embodied the leading features of the system into an act, and in 1889 the following-named states followed the Massachusetts bill in the main: Indiana, Montana, Rhode Island, Wisconsin, Tennessee, Minnesota, Missouri, Michigan and Connecticut. In 1890 the system became a law in Washington, New York, Maryland, Vermont and New Jersey, and other states followed, from time to time.

Previous to the introduction of this system the defects in the original laws regulating elections had become so apparent that in many of the states ballot reform associations were organized by the best classes of citizens, irrespective of party affiliations, and to their efforts was due the adoption of the measure in the majority of the states.

Among the advantages of these laws are the following: 1. The casting of a secret ballot interposes the most effectual bar to bribery yet devised. 2. The secret ballot secures the voter against coercion or undue solicitation. 3. Excuse for the assessment of candidates is removed. A poor man, as a candidate, is placed on an equality with a rich man, and money becomes far less of a factor in politics. 4. Elections are, more than ever, the intelligent and conscientious registering of the popular will.

The law as adopted in Massachusetts has been so nearly copied into the acts of almost all of the states that a synopsis of it gives an idea of the principal features of the plan adopted in the United States. Candidates for offices to be filled at the next election are entitled to have their names placed on the ballots under the following conditions: The candidate may be selected by a convention of delegates representing a party which, at the election next preceding, polled at least three per cent of the vote for corresponding officers. Under this restriction the convention may place in nomination one candidate for each office to be filled. The presiding officer and secretary of the convention are required to file with the proper official a certificate of the nominations made, the same to be under oath. Where no convention is held, a candidate's name may be placed on the ballots, when nomination papers signed by the requisite number of electors are filed with the proper officials, the number varying with the size of the constituency involved. The forms of these certificates are fixed by law, and they must be filed a specified number of days in advance of the election,—this, too, varying with the election to be held. If no objections against the nominations are sustained by the officials designated by the law to hear and determine them, the names of the candidates shall be placed upon the ballots, unless a candidate shall withdraw his name under the form provided for so doing. The form of the ballot is prescribed, and it is required to be in con-

venient packages, books or blocks, in such manner that a ballot for each voter may be detached. Each polling-place must be provided with two sets of ballots, each set to consist of not less than 100 for each 50 and fraction of 50 registered voters. The duplicate set of ballots is provided to meet the emergency of one set being lost, destroyed or stolen, or voters exceeding the expected number. The packages must be kept sealed until the opening of the polls, and then publicly opened and delivered to the officers in charge. If for any cause the ballots fail to reach the voting-precinct, the clerk thereof shall cause ballots to be prepared, and on certifying to the non-receipt of the original ballots, those so substituted shall be counted as legal. Cards of instruction and specimen ballots must be posted in the polling-place, and in the booths or compartments occupied by the voter in marking his ballot. A person desiring to vote must give his name, and if requested, his residence, to one of the ballot clerks, who thereupon announces the name in a loud and distinct tone of voice. If the name is found on the check-list by the officer having the same in charge, he repeats the name, and the voter is allowed to enter the space reserved for the purpose. The ballot clerk then gives him only one ballot, and his name is checked.

The law regulates the construction of the polling-place, and the compartments are so arranged as to shield the voter from observation while preparing his ballot. Besides the election-officers, not more than four voters in excess of the number of compartments or voting-shelves are allowed in the inclosed space at one time. The law provides how the voter shall indicate his choice of candidate, and how he shall procure fresh ballots on spoiling the one given him, and how he shall deposit his ballot when ready to do so. It also provides that he shall not occupy a compartment with another person, nor more than five minutes when other voters are waiting, and he shall not remain within the inclosed space for more than ten minutes. Provision is made for assisting voters unable to mark their ballots by reason of not being able to read or through physical disability. Ballots that are not properly marked are not counted, but must be returned, together with all that remain unused, at the close of the election. Severe penalties are provided for the punishment of voters who allow their ballots to be seen, with an apparent intention of letting it be known how they are about to vote, or who place any distinguishing marks on their ballots, or who make false statements as to their inability to mark their ballots. Punishment is also prescribed for any one interfering with a voter when in the inclosed space, or when marking his ballot, or for any one who shall endeavor to induce a voter to show how he marks or has marked his ballot before voting. Provision is made for the protection of the lists of candidates and of all of the legally authorized apparatus required by the law, and the most severe penalties are prescribed for those who forge or alter any official signature, or who destroy, deface or remove any ballots from the polling-place or delay the delivery of the same.

It is admitted that this system has, in a great measure, destroyed the blighting influence that politicians formerly exercised over fair and impartial elections, and the power to manipulate tickets is removed by the manner in which the ballots are furnished. See BALLOT, Vol. III, pp. 288–292.

BALLOU, HOSEA, an American clergyman and author; one of the founders of the Universalist denomination in America; born at Richmond, New Hampshire, April 30, 1771; died in Boston, June 7, 1852. He was a self-educated man, having learned to form the letters of the alphabet with a piece of charcoal on a strip of birch bark. He began to preach early in life, and was successively minister of congregations in Portsmouth, New Hampshire; Salem, Massachusetts and Boston. To him is due the broader type of the Universalist denomination, for, under his influence, it abandoned the evangelical orthodoxy first imprinted on it by John Murray. He was editorially connected with the *Universalist Magazine* and the *Expositor*, and wrote numerous religious books, the principal being *Notes on the Parables* (1804); an *Examination of the Doctrine of a Future Retribution;* and *A Treatise on the Atonement* (1804).

BALLOU, HOSEA, an American Universalist clergyman and educator; born at Halifax, Vermont, Oct. 18, 1796; nephew of Hosea Ballou, mentioned above; editor of the *Universalist Quarterly*, author of *Ancient History of Universalism*, and the first president of Tufts College, serving from 1854 until his death, at Somerville, Massachusetts, May 27, 1861.

BALLOU, MATURIN MURRAY, an American journalist; born in Boston, Massachusetts, April 14, 1820, the son of Hosea Ballou the younger; was editor and proprietor of *Ballou's Monthly*, editor of the Boston *Daily Globe* and other journals. He wrote several books descriptive of his travels. He died in Cairo, Egypt, March 27, 1895.

BALL'S BLUFF, Loudoun County, Virginia, a steep bank 150 feet high, on the right side of the Potomac River, about 33 miles N.W. of Washington, District of Columbia. It was the scene of a heavy reconnaissance by Union troops, that turned into a general conflict with the Confederates, Oct. 21, 1861, in which the former were badly defeated, and their leader, Col. E. D. Baker, killed.

BALLSTON OR BALLSTON SPA, the county seat of Saratoga County, New York. It is on the Delaware and Hudson railroad, and distant from Saratoga about six miles. The mineral springs here are acidulous chalybeates, and are considered among the best in the United States. Large paper mills and a tannery are located in the town. Population 1890, 3,527.

BALM, a name applied to several species of *Labiatæ*, notably *Melissa officinalis* of the Old World, a very sweet, lemon-scented herb, with ovate, toothed leaves and yellowish to white flowers in axillary clusters, cultivated in gardens in the United States; and the American species of *Monarda*, taller plants, with conspicuous clusters of larger variously colored flowers. *M. fistulosa* is the wild bergamot; *M. didyma*, the Oswego tea, and *M. punctata*, the horsemint. All the balms receive their name from supposed medicinal virtues.

BALM, Col De, the name of a mountain pass which forms that portion of the route from Martigny to Chamouni, which lies between Mont Blanc and the Dent du Midi. The summit is 7,200 feet high.

BALMACEDA, José Manuel, late president of the republic of Chile, was born in Santiago, in 1840, of good family; educated for the priesthood; he entered politics and founded the Reform Club. Being progressive in his views, he was soon at the head of the Liberal party, outstepping even the most radical by a scheme, in 1874, for the total separation of church and state. After some service as a legislator and cabinet minister, he became president of the republic in September, 1886. For more than half his term of five years he continued in harmony with his party, and the country advanced in material prosperity. The Liberals then became factious on the question of who should succeed him, and after a period of contention and tumult Balmaceda vetoed a bill which was designed to place elections under the control of municipalities. This initiated a struggle between the executive and legislative departments, which, in January, 1891, assumed a violent form by the open revolt of congress and the navy. The president had with him the standing army and assumed its active command. The congressionalists raised another force and then undertook to depose him. A fierce war was waged for months. A final and desperate battle at Viño del Mar, Aug. 28, 1891, resulted in Balmaceda's total defeat. He attempted to flee from the country, having previously shipped $1,000,000 in treasure on a British vessel, but missing his own passage ,ventured to hide in the Argentine legation at Santiago, where he committed suicide, Sept. 19, 1891.

BALSAMINACEÆ, formerly used as the family name of a group of succulent, herblike plants now referred to the *Geraniaceæ*.

BALSAMODENDRON, an old generic name given to a group of small, bushy trees of the family *Burseraceæ*, now known as *Commiphora*, or the "myrrh tree." They are characterized by a scanty foliage, and by the resinous balsam which the fruit and wood yield. See Balsam, Vol. III, p. 293; Myrrh, Vol. XVII, p. 121.

BALTIC AND NORTH SEA CANAL. See Canal, in these Supplements.

BALTIC LANGUAGE. See Philology, Vol. XVIII, p. 785.

BALTIC PROVINCES (in Russia), a term which in a wider sense comprehends the five Russian governments bordering on the Baltic, namely: Courland, Livonia, Esthonia, Petersburg, and Finland. In a restricted sense it often designates the first three. The Baltic Provinces once belonged to Sweden, except Courland, which was a dependency of Poland. They came into the possession of Russia, partly in the beginning of the eighteenth century, through the conquest of Peter the Great, partly under Alexander in 1809. They have an area of about 200,000 square miles, with a population of 5,000,000, including St. Petersburg.

BALTIC QUESTION, the struggle still going on between the old German ideas and influences and the efforts of the imperial government to completely Russianize the inhabitants of the three Baltic provinces, Esthonia, Livonia and Courland; q.v. When Peter the Great conquered these provinces he guaranteed the people freedom in religious and educational affairs. The religion was largely Lutheran, and German the language of the schools. Alexander II confirmed these privileges, but Alexander III, in 1888, commanded that Russian be taught exclusively in their schools. As a result many of the best schools were closed. The serious opposition of the peasantry and the uncompromising attitude of the czar's government brought into prominence what has since been known as the Baltic question.

BALTIMORE, the chief city of Maryland in population and commerce, is described as it was in



CITY HALL, BALTIMORE.

1874 in Vol. III, pp. 298, 299, of this Encyclopædia, The entire area of the city is 31½ square miles, two wards having been annexed in 1888 from the surrounding county. Baltimore County has an area of 622 square miles, and suffered a reduction of population, from the annexation, of over 10,000 souls. (It was 72,909 in 1890.) The census enumeration of the city in 1890 was 434,439, or nearly 42 per cent of the population of the state, and recorded it as the seventh city of the Union for size. The negro element forms one sixth. The Board of Trade put the population at 525,000 in 1895.

In the usage of Marylanders it is customary to speak of the part of the state not included in Baltimore as "the counties," and the relation of the city and the counties is of weighty import in state politics and legislation.

The artificial lakes, Roland and Leven, are formed by the damming of two streams, Jones's Falls and Gunpowder Creek, the former having an elevation of 225 feet above tide-water, and the latter of 170 feet. The watersystem is that of gravity, and the underground conduits are nearly four miles of

masonry from Lake Roland, and seven miles from Loch Leven, to the distributing-reservoirs on Druid Hill, at Clifton, and in the eastern part of the city. There are reservoirs on the lines, and the aggregate storage capacity of the system is 2,346,000,000 gallons, while the daily delivery is 165,000,000. The distributing-pipes underlie 350 miles of streets, and the cost of the system has been over $10,000,000.

Education in this city received a fresh impulse through the distribution of the estate of Johns Hopkins. One moiety went to the university that bears his name, which was incorporated in 1876. It has modest but commodious buildings in the central part of the city, but the institution was forbidden to use the Hopkins fund in the erection of structures. Another moiety of the estate went to the founding of an imposing hospital, which occupies four squares in the north-central part of the city, is on the pavilion system, and embodies the best hygienic and therapeutic appointments. It is practically auxiliary to the medical department of the Johns Hopkins University. In addition, the women of Baltimore raised the "Garrett Fund," so called from Mary E. Garrett, the principal donor, of $500,000 to establish a woman's medical college and hospital in connection with the same university, and this institution was organized in 1893. In 1882 Enoch Pratt founded a free public library, with gifts amounting to nearly $1,100,000, with conditions requiring the city to secure it an annual income of $50,000. The principal building, a Romanesque structure of white marble, near the Catholic Cathedral, is 142 by 82 feet. It was opened two years later, and now has five circulating branches, with 165,000 bound books on its shelves. Besides this library, and those of the university and other educational institutions, there are the Whittingham Memorial library, belonging to the Protestant Episcopal diocese, the Mercantile Library, and one each belonging to the city, the Odd Fellows and the Maryland bar. Other educational institutions of prominence in the city are the Maryland University, with its dental department, organized in 1882; Loyola College, opened in 1852; the Morgan School, for colored youth, chartered in 1889; Calvert Hall, a Catholic institution; the Bryn Mawr Preparatory School, for girls, founded in 1889; College of Physicians and Surgeons, incorporated in 1872; Baltimore Medical College, organized in 1881; Baltimore University School of Medicine, founded in 1884; a Homœopathic College, begun in 1890; a College of Pharmacy; the Maryland Institute for the Promotion of the Mechanic Arts; an Academy of Sciences; a State Historical Society, and schools for the blind and the deaf and dumb. Connected with the public school system are the City College, a normal school, a polytechnic institute and a manual-labor school.

Among recent public buildings is the handsome structure erected by the United States for uses of the post-office and of Federal courts. The edifices of the Maryland Institute, an arcade building 350 feet long; of the white marble Masonic Hall; of the suburban Bay View Asylum, for paupers; and of the Sheppard Asylum for the Insane,—are imposing and worthy of note.

Besides Druid Hill Park and several ornamented open squares, there are Federal Hill Park, overlooking the inner harbor, once fortified and garrisoned by Union troops, who held the city in the days of Civil War following the street attack of the Baltimore mob, April 19, 1861, upon Massachusetts troops on their way to Washington; Riverside Park, between the two branches of the harbor waters; the large Patterson Park, in Canton, and the Clifton and Schutzen Parks, in the northwestern suburbs.

*Industries.* Baltimore, with its room for expansion in all directions, has never encouraged tenement-buildings, with their congested population. There are many streets with small separate brick dwellings, renting at low rates, and hence the operative population is unusually stable, and wages are low, compared with Northern and Western cities. The principal industries are clothing, of which more than $15,000,000 worth is annually turned out; oyster and fruit canning, tobacco manufactures, iron-founding, meat-packing, fertilizers, malt liquors, flour and grist grinding, lumber, musical instruments, distilled liquors, drugs and medicines, brass-founding, furniture, confectionery, boots and shoes, ship-building, and marble and stone work named in their order of importance, and ranging in output from $1,600,000 for stone-work to $8,500,000 for the canning industry. By the eleventh census there were in Baltimore 5,265 manufacturing establishments, having an aggregate capital of $92,723,677, employing 83,745 hands, and putting out products valued at $141,723,599. At the shipyards, once famous for their clipper-ships, the unarmored cruisers *Detroit* and *Montgomery*, of about 2,000 tons each, were launched in 1892. About 20 vessels of all descriptions were built at them in 1895, with a gross tonnage of nearly 3,000 tons. The principal establishment is near Fort McHenry. Copper-refining is extensively carried on, as the Arizona and Montana mines are controlled by Baltimore capital, and the output has risen to about 30,000 short tons a year, which is made into sheet-metal, wire and sulphate.

*Commerce.* The principal foreign trade of this port is with Great Britain and Germany. For the year ending June 30, 1895, there entered this port from foreign countries 633,635 tons, and cleared 976,806 tons, of which 94 per cent was in steam-vessels. The coastwise trade for the same year was estimated at over 5,400,000 tons. Direct lines of steamers run to Brazilian, Mexican and Cuban ports, as well as to those of England and Germany. The Brazilian trade consists chiefly in the exchange of wheat and flour for coffee. The imports of Baltimore for the fiscal year of 1895 were $12,260,706, and the exports $61,929,360,—a decrease of exports from the preceding year of over $16,000,000. The chief exports were breadstuffs, provisions, cotton, tobacco, cattle, oils and copper. Coffee was the largest commodity imported, and for the same year its valuation was $4,000,000. Immigrants landed here the same year to the extent of 7,081, of whom 3,831 were Germans. There is here a trade in anthracite and bituminous coal, reaching some 3,000,000 tons annually.

*Banking.* In 1894 there were 23 national and

4 state banks, having a combined capital of $14,418,260; deposits, $34,921,066; loans, $35,958,830; surplus, $5,028,704. Bank clearances for the same year were $673,443,512.

BALTIMORE, a fishing-village of Ireland, on the bay of the same name, in the county of Cork. It is 7 miles S.W. of Skibbereen. Here is a school, founded in 1887 by the Baroness Burdett-Coutts, in which are taught all the branches pertaining to fishing-net making, sail-making and other industries of a seafaring life.

BALTIMORE, GEORGE CALVERT, LORD, born in Yorkshire, England, about 1582; died in London, April 15, 1632. He graduated at Oxford, and then went abroad for travel. James I made him secretary of state and knighted him, but he changed to the Roman Catholic religion in 1625 and resigned his office, receiving the title of Baron Baltimore, in the peerage of Ireland. He was interested in colonization and spent much money on a settlement in Newfoundland, which place he visited, but finding it too cold, he sailed southward to Virginia. Charles I granted him the land now comprised in Delaware and Maryland, but Lord Baltimore died before the papers were satisfactorily completed. He was a popular man, a strong believer in the divine right of kings, but his position as one of the proscribed Roman Catholics made him an advocate of large toleration in his plans of colonization. See MARYLAND, Vol. XV, p. 605.

BALTIMORE BIRD OR BALTIMORE ORIOLE (*Icterus galbula*), a beautiful American bird, found in Mexico and the eastern United States as far north as 55° N. lat. in summer, but migrating to Central America and the West Indies in winter. The plumage is black and yellow. These colors are said to have suggested the name because of the resemblance to the coat of arms of Lord Baltimore. The bird is very beautiful, active and a sweet singer. It is valuable as a destroyer of harmful insects.

BALTISTAN OR LITTLE THIBET, the name of the alpine region through which the Upper Indus flows. It lies below the Karakorum and Himalaya mountains, having an average height of 11,000 feet. Here rises a lofty peak which ascends to an elevation of 28,278 feet above the sea-level, and is surpassed in height only by Mount Everest. It is politically a part of Kashmir, and the inhabitants are of Mongolian stock. See TIBET, Vol. XXIII, p. 339; see also LADAK and BALTI, Vol. XIV, p. 198.

BALTJIK is a Bulgarian seaport town on the Black Sea. It is situated 20 miles N.E. of Varna, and not far from it lies the ruined town of Tomi, the home of Ovid during his exile. Population, 4.000.

BALUCHISTAN, a British quasi-protectorate south of Afghanistan. Population, about 500,000. For early history, see BALUCHISTAN, Vol. II, pp. 299–303.

The reigning sovereign is Mir Muhammad Khan, khan of Khelat, who succeeded his father in August, 1893, when the latter abdicated under pressure.

The khan of Khelat is at the head of a confederacy of chiefs, but his powers cannot be precisely defined. In all important matters he is amenable to the advice of the agent of the governor-general of India, who also arbitrates in disputes between the khan and minor chiefs.

The area of Baluchistan includes British Baluchistan, assigned to England by the ameer of Afghanistan in 1878, constituted a chief commissionership in November, 1887, and comprising Pishin, Shorarud, Kach, Kawas, Harnai, Sibi and Thall-Chotiali, with an area of about 11,100 square miles. The nomad Baluchis are the most widely spread race, the Brahuis of the eastern plateau being the dominant race.

The principal towns are Khelat (the capital), Mastang, Kozdar, Bela, Kej, Bagh, Dadar, Gandava Nushki, Sarawan, Pasni, Sonmiani and Quetta.

The religion is Mohammedan.

There is no standing army, but the khan could perhaps assemble, at an emergency, 10,000 irregular tribal levies, indifferently armed. The fortifications recently erected by the Indian government lie within the territory under British administration. The numerous forts scattered about independent Baluchistan could offer no resistance against artillery.

The khan of Khelat's revenue consists of his subsidy from the Indian government of 100,000 rupees a year, his quit-rent of 25,000 rupees for the Quetta district, and a share in the agricultural produce taken from the inferior cultivators in independent Baluchistan, Brahuis being exempt.

The agricultural produce of Baluchistan is limited, owing to the scanty and uncertain rainfall, but most of the crops grown in India may be found in the country. Petroleum is found at Khatum. Baluchistan is an immense camel-grazing country. Local manufactures are unimportant, being confined to a few matchlocks and other weapons. The chief exports are wool, hides, madder, dried fruit, bdellium, tobacco and dates. In 1895 the exports to British India were valued at 122,910 rupees, and the imports from British India at 63,544 rupees.

The country through which the Bolan and Sind-Pishin railways run is under British administration. Elsewhere camels serve as the chief means of transport.

There is a line of telegraph to Khelat, and the submarine cable from Karáchi to the Persian Gulf touches at Gwadar.

BAMBERGER, LUDWIG, a German politician and economist; born in Mentz in 1823. He supported the revolution of 1848, and on its failure became an exile. In Paris he was known as a writer on finance and political economy. He returned to his native town after the war of 1866, and was a member of the Reichstag, 1873–80. During the Franco-Prussian war he was an adviser of Bismarck, at the headquarters of the latter, and afterwards assisted in the adjustment of the affairs of Alsace. In 1880 he assisted in forming the Liberal Union. The writings of Bamberger are numerous, dealing with the financial, labor and other social questions of the hour.

BAMBINO (It. *babe*), a term in art descriptive of the swaddled figure of the infant Saviour, which, surrounded by a halo and watched over by angels, occasionally forms the subject of altar-pieces in the

Roman Catholic churches. The Santissimo Bambino, in the Church of the Ara Cœli at Rome, is supposed to possess miraculous ability to cure the sick. It is carved in wood, painted and richly decorated with jewels and precious stones.

BAMBOCCIADE (*bamboccio*, an Italian word meaning cripple), a term, in artistic parlance, applied to scenes of low life, derived from Bamboccio, the surname of a painter called Pieter van Laar, a Dutch genre painter, who lived between 1613 and 1674. He painted with much humor and exactitude, and his style was copied so much that the word became an artistic term.

BAMO, a Burmese city. See BHAMO, Vol. III, p. 627.

BAN AND ARRIÈRE-BAN. In feudal times, in France, the terms meant the entire military force of the country. The *ban* was the call-levy of the barons when summoned to war; the second levy, which included their vassals, was known as the *arrière-ban*.

BAN OR BANUS, the term used in eastern Hungary for military governors of certain districts, or banats. They were appointed by the king, and had extensive political, military and judicial rights. Dalmatia, Slavonia, Bosnia, Croatia and Makovia were the chief banats, but they were finally united under the banats of Croatia and Dalmatia.

BAN, MATIZA, a Servian poet, dramatist and statesman; born at Ragusa, Dalmatia, Dec. 18, 1818. After his marriage to a Greek lady at Constantinople in 1840, he settled at Belgrade in Servia. Here he was tutor to the prince regent's daughters. He took an active part in the revolution of 1848, and amid its turmoil wrote his famous tragedy, *Mejrima, or the Liberation of Bosnia*. He was minister of foreign affairs for Servia in 1860; received a national pension in 1868, and in 1885 was tendered a national ovation. He has published plays and poems, and treatises on the political questions of the Balkan Peninsula.

BANANA-BIRD, a bird of the genus *Icterus*, closely related to American orioles, and found in tropical America and the West Indies. The name was suggested by the supposed banana-eating habits of some species. The banana-bird is often domesticated.

BANANA-QUIT, a name applied to birds of the genus *Certhiola*. The name is often given to the black and yellow honey-creeper, *C. flaveola*, which is found in tropical regions of America, and as far north as Florida.

BANAS OR BUNAS, the name by which three rivers of India are known. The first is in Rajputana; q.v. The second rises in the mountains of Arvalli, flows southwest for 180 miles, and dissolves itself in the Run of Cutch. The third, a river of Bengal, in Chutia Nagpur, runs 70 miles toward the northwest, and falls into the Son, near Rampur.

BANC is a legal term, meaning a judge's bench or seat. When the court sits *in banc* all or a majority of the judges composing the court sit together to hear questions of laws, as distinguished from sitting at *nisi prius*, which means one or more of the judges sitting with a jury for the purpose of trying such cases as may be tried before a jury.

BANCO, a commercial term meaning the standard money in which a bank keeps its accounts, as distinguished from the current money of the place. The term is now chiefly applied to the money in which the Hamburg bank keeps its accounts, which is not represented by any coinage. Genoa had at one time a bank standard, and the present current money being different from that, is still called "*fuori banco*" outside the bank.

BANCROFT, AARON, an American Unitarian minister; born Nov. 10, 1755, at Reading, Massachusetts; was educated at Harvard, and for over 50 years held a pastoral charge at Worcester. His literary works include a *Life of George Washington* and a number of sermons. He was the father of George Bancroft, the historian; died at Worcester, Massachusetts, Aug. 19, 1839.

BANCROFT, EDWARD, an American surgeon; born at Westfield, Massachusetts, Jan. 9, 1744; practiced medicine in Guiana, and for many years resided in England. He was a friend of Benjamin Franklin, claimed to have exerted himself on behalf of the colonies, but is suspected of being a paid spy of the House of Hanover. He wrote several political works, and died in London, Sept. 8, 1820.

BANCROFT, GEORGE, son of Rev. Aaron Bancroft; born at Worcester, Massachusetts, Oct. 3, 1800; died at Washington, District of Columbia, Jan. 17, 1891. He graduated at Harvard in 1817 and spent two years studying in the German universities. The University of Göttingen conferred upon him the degree of Ph.D. It was at this time that he selected history for his special branch of work. He made the acquaintance of Humboldt, Savigny, Goethe and other famous men, and pursued his studies with Schlosser, the historian.



GEORGE BANCROFT.

He returned to the United States in 1822, and, after serving as a Greek tutor in Harvard for a year, started, in partnership with Dr. Joseph G. Cogswell, the Round Hill School at Northampton, Massachusetts. He declined a nomination to the Massachusetts assembly, and later the nomination to the state senate. He was engaged in making translations from Schiller, Goethe and the historical works of Heeren. Mr. Bancroft was a Democrat, and Van Buren made him collector of the port of Boston in 1838. In 1842 he was an unsuccessful candidate for governor, but on the election of Polk to the Presidency, was made Secretary of the Navy. It was through his official influence that the Annapolis Naval Academy was established. He issued the famous orders to take possession of California in the event of war with Mexico, and (while acting as Secretary of War *pro tem.*) he ordered General Taylor to cross the Nueces River into the disputed Texan territory and thus begin the Mexican War. In 1846 he was sent as minister to the court of St. James's; in 1867, to Prussia; in 1868, to the North German Confederation;

in 1871, to the new German Empire, whence he was recalled three years later, at his own request. He participated in the settlement of the Northwestern boundary dispute, and in the treaty concerning expatriation rights with Germany, which provided that citizens of either country naturalized in the other should, after five years' residence, be accepted as citizens of the state thus chosen. Great Britain afterwards subscribed to this treaty. Mr. Bancroft's greatest work was that of the historian. In 1834 he began the publication of his *History of the United States*. It opens with the discovery of America by Columbus, and chronicles events down to the close of the Revolutionary War and the formation of the constitution. It is very authentic, but is not broadly philosophical, yet it received the highest commendation from such scholars as Prescott, Edward Everett, Von Raumer, Baron Bunsen and George Ripley. In its final form it is the work of many revisions, based on research continued until late in life, and years were spent in polishing the style. Mr. Bancroft delivered many addresses, which have been published. He also was at work on a biography of James K. Polk. Mr. Bancroft made his winter home in Washington for several years. He was a man of careful habits, fond of walking and horseback riding. His manners were extremely courteous. His height was somewhat below the average, and in his youth he was spoken of as "Little Bancroft." In a letter to a friend, written in 1882, he said: "Being more than fourscore years old, I know the time for my release will soon come. Conscious of being near the shore of eternity, I wait without impatience and without dread the beckoning of the Hand which will summon me to rest."

BANCROFT, HUBERT HOWE, born in Granville, Ohio, May 5, 1832. He went in 1848 to Buffalo and entered the bookstore of his brother in law. Four years later he was sent to California to establish a branch business. Here he became interested in collecting books relative to the history of the Pacific Coast. He was so fortunate as to secure the library of the Mexican emperor, Maximilian. He collected a library of 45,000 volumes. With this material at hand Mr. Bancroft began his historical labors. At great pains he obtained from pioneers and settlers many valuable narratives, which he caused to be written down and indexed. He has published *The Native Races of the Pacific States* (5 vols.) In this work he was aided by an experienced corps of writers. He planned to publish 39 volumes of the *History of the Pacific States of North America*, and issued about 40 volumes, of great value as treasuries for the use of some expert critic and philosophical historian. On this work he employed a large number of secretaries and collators of authorities, aspiring more to save records than to write narratives. In 1886 he met with a great loss in the burning of his brother's store, where the sheets of seven volumes of his history were kept.

BANCROFT, SQUIRE BANCROFT, an English actor and lessee of Haymarket Theatre, was born May 14, 1841, in London; began playing at 24, at the Prince of Wales Theatre, in comedy; married Marie Effie Wilton in 1867, who was joined with H. J. Byron as lessee of the latter theater and thus began the business of manager; controlled the Haymarket from 1879 to 1885, when he retired rich. He was knighted at the Queen's Jubilee in 1897. His rôles were Shakespearean and in high class comedy. His wife was of an old Gloucestershire family, first played burlesque parts in the country; partner in management in 1865; acted in many plays written for her by T. W. Robertson; retired with her husband in 1885; wrote *Mr. and Mrs. Bancroft on and off the Stage.*

BANDAI-SAN, a Japanese volcano, situated 140 miles N. of Tokyo. Several cones constitute the volcano, one rising to a height of 6,040 feet above sea-level. It was the scene of a terrific internal convulsion, July 15, 1888, when one side of the mountain blew out, producing a gigantic crater and killing nearly 500 villagers.

BANDAJAN, a Himalayan mountain pass of Kashmir. The mountains surrounding this pass are composed of gneiss, and the summit rises to an elevation of 14,854 feet above sea-level. Here snow continually rests. It is situated in lat. 31° 22′ N., long. 78° 4′ E.

BANDANA, a kind of printed handkerchief of Indian origin, in which the color of the pattern is discharged by enormous pressure. The patterns in the real bandana style of printing are spots and diamond prints, the best suited for discharging, and even for these a pressure of 500 tons is required to work them clean. See CALICO PRINTING, Vol. IV, p. 689.

BANDA ORIENTAL, the former name of Uruguay. See URUGUAY, Vol. XXIV, pp. 14–16.

BANDEL, JOSEPH ERNST VON, an eminent modern sculptor, born at Ansbach, May 17, 1800; died near Donauwörth, Sept. 25, 1876. He studied at Munich, where, in 1820, he sent to the exhibition a life-size plaster figure of Mars reposing, which attracted much attention, and at Nuremberg and Rome. His principal work was the statue of Arminius, 90 feet high, near Detmold, which the Emperor William unveiled on Aug. 16, 1875.

BAN-DE-LA-ROCHE OR STEINTHAL, a valley of Lower Alsace, in the Vosges Mountains. See OBERLIN, J. F., Vol. XVII, p. 704.

BANDELIER, ADOLPH FRANCIS ALPHONSE, an American archæologist; born at Berne, Switzerland, August 6, 1840; was employed by the Archæological Institute of America, and made extensive explorations in New Mexico, Arizona, Mexico, Central America and South America. Bandelier has done much to clear off the fables from the face of his chosen science. In his hands the evanescent town of El Dorado turns to a prosaic tale, with some foundation, of El Hombre Dorado (the gold-smeared man). He is an apologist for the Spaniards; their cruelties he disproves or discounts, on the score of difficulties and glorious discoveries. His contributions to the literature of American archæology have been numerous and were printed in the principal magazines.

BAND-FISH OR SNAKE-FISH, a name given to fishes of the genus *Cepola*. The body is elongated and greatly compressed; hence they are often called ribbon-fishes. They are remarkable for their

beautiful colors. Some species are found in Japanese waters, and one in the Mediterranean.

BANDICOOT RAT (*Mus giganteus*), the gigantic rat; a native of India. It is the largest known species, often two feet in length. This rat is a great pest in gardens and rice-fields. The name is evidently derived from the native name pandi-koku, which means pig-rat. See MOUSE, Vol. XVII, p. 5.

BANDIERA, ATTILIO AND EMILIO, two brothers, descended from a distinguished aristocratic family of Venice, and well known for their tragic fate. They were lieutenants in the Austrian navy, their father being rear-admiral, but instead of sharing his Austrian sentiments, they cherished dreams of a united republic of Italy. In 1842 they entered into correspondence with Mazzini. In 1843 they believed that the time had come for a revolution, but their premature appeal finding no practical response, they fled to Corfu in 1844, where they endured many bitter disappointments and much misery. At length, misled by false rumors of a rising in Naples, with which it is supposed the Neapolitan police had something to do, they ventured to land with 20 companions at the mouth of the small river Nieto, in Calabria, believing that their appearance would be the signal for a general insurrection. The Neapolitan government expected them, as one of their companions, Boccheciampe, had betrayed them. They were attacked by an overwhelming force and were nearly all taken prisoners at once. Attilio and Emilio were shot, with seven of their comrades, in the public square of Cosenza, July 25, 1844, exclaiming "Viva l' Italia!" They died at the ages of 27 and 25 respectively. A year later their remaining companions were pardoned. Their letters to Mazzini, who was then in refuge in London, were opened by the British government at the request of Austria, and the indignation aroused by the discovery of the ignominious fact resulted in giving new sacredness to communications by British mails.

BANDIT, a word properly signifying a "banished" or outlawed person, who, because outlawed, wages war against civilized society, and resorts to highway robbery. The bandits, or banditti, formed in Italy in earlier times a community that submitted to its own laws, carried on both open and secret war with civilized society, and kept up a certain romantic idea of honor. By means of severe measures adopted in 1820 by the Papal government, the banditti and their abettors were broken up. Those who still occasionally disquiet the frontiers of Naples are, in general, people settled on the spot, and who regard robbery and ransom as a trade. In the northeast of Greece and in Albania, owing to the impotency of the Greek and Turkish governments the country is infested with bandits.

BANDONG, a commercial town of western central Java, near the volcano Gunong Gontour, an eruption of which, in 1822, destroyed 80 villages. Since 1864 Bandong has been the capital of a province known as the Preanger Regencies.

BANEBERRY, a name applied to species of *Actæa*, a genus of *Ranunculaceæ*, or crowfoots, characterized by their large compound leaves, conspicuous terminal cluster of flowers whose white sepals fall off as the flower opens, and red or white berries. They grow in rich woods throughout North America.

BANER, BANNIER OR BANNER, JOHAN, a famous Swedish general; born near Stockholm, June 23, 1595. He led the right wing of the army at the battle of Leipsic, and after the death of King Gustavus Adolphus was commander-in-chief. He gained a remarkable victory at Wittstock in October, 1636, and again at Chemnitz in 1639, after which his victorious army overran the principal parts of Germany. He is eulogized by Schiller in his *History of The Thirty Years' War*. Died at Halberstadt, June 20, 1641.

BANGOR, a city of Maine, and county seat of Penobscot County. On the opposite bank of the Penobscot River, and connected with Bangor by a bridge, is the thriving little city of Brewer. The larger city is a point of departure for hunters and tourists entering the Maine woods, and it is the terminus of a railroad stretching 200 miles into Aroostook County as far as Caribou. It is an important railroad center, a port of entry, and one of the greatest lumber depots in America. An abundant water-power is supplied by the Kenduskeag, and by means of a dam built across the Penobscot in connection with the Holly system of water-works. The season of navigation lasts about 8 months, during which more than 2,000 cargoes of lumber are shipped, averaging some 200,000,000 feet annually. The ice trade here is important, and there is a storage capacity for 450,000 tons. Salmon-fishing below the dam is a sport of recent development. The vessels entering this port in the coasting and foreign trade are mostly American, and number nearly 400, about half of which, aggregating a tonnage of nearly 35,000, are enrolled, registered and licensed here. An important commercial interest is the manufacture of boots and shoes, and there are numerous other manufactures, including iron, lumber, machinery, furniture, trunks, carriages and sleighs, and an extensive establishment for burnettizing. Bangor is the seat of Bangor Theological Seminary, a Congregational school chartered in 1814, and located here five years later. It has about 45 students in attendance, owns grounds and buildings valued at $80,000, has a productive endowment of nearly $240,000 and a library of 17,000 volumes. The city is on the site of Fort Norombega, a French post established in 1656. The name was changed to Kenduskeag in 1769 by the first English-speaking settlers, and afterwards to Bangor, in honor of the psalm-tune of that name. Population 1880, 16,856; in 1890, 19,103. See BANGOR, Vol. III, p. 314.

BANGOR, a borough of Northampton County, in east-central Pennsylvania, situated on the New Jersey Central and Bangor and Portland railroads, about 15 miles N. of Easton and 9 miles from Portland, on the Delaware River. It is the center of the slate district of Pennsylvania. Population 1890, 2,509.

BANGOR-ISCOED (BANGOR BELOW THE WOOD) OR BANGOR IN MAELOR, an inland village, beautifully situated in a fertile and richly wooded country, on the right bank of the Dee, on the borders of Flint and Denbigh shires, North Wales, 5 miles S.E. of Wrexham. Population, 554.

BANGS, NATHAN, an American clergyman; born near Bridgeport, Connecticut, May 2, 1778, died in New Haven, Connecticut, May 3, 1862. In 1802 he was admitted to the New York conference of the Methodist Episcopal Church, and the next six years of his life were spent in the then almost pathless forests of Canada as an itinerant preacher. In 1810 he was transferred to New York City. In 1820 he assumed charge of the Methodist Book Concern, and under his management its business was vastly extended. From 1820 to 1828 he was editor of the *Methodist Magazine*, and from 1826 to 1828 of the *Christian Advocate*. In 1832 he assumed editorial charge of the *Methodist Quarterly Review*. In 1841 he became president of Wesleyan University, Middletown, Connecticut.

BANGWEOLO OR BEMBA LAKE. See AFRICA, Vol. I, pp. 248, 255.

BANIAN, BANYAN OR BANIYAS (from the Sanskrit *banij*, a merchant), a word used in India to designate a merchant of the Sind and Northwest Provinces. It is more particularly applied by the English to the great native merchants in the west of India, who, by means of caravans, carry on a very extensive trade with the interior of Asia, even to the borders of Russia and China, and trade by ships with ports on the Indian Ocean. In Bengal the native factors and interpreters of Europeans are also called banians.

BANIAN DAYS, a sailor's phrase, nearly equivalent to the *jours maigres* of the French. The term denotes the days when no meat is served out to a ship's crew, and this use of it arose from the fact that the banian traders of India, being Hindus, do not eat flesh.

BANISTER, JOHN, a Virginian botanist of English birth; settled in the seventeenth century near Jamestown and made a catalogue of Virginian plants for *Ray's Botany*. A genus of plants is named *Banisteria* in honor of this pioneer botanist, who lost his life by a fall from his horse in 1692 while on an expedition in relation to his favorite science.

BANIWAS, a tribe of Indians living along the Amazon and Rio Negro rivers, in South America.

BANJO, a musical instrument somewhat like the guitar, but having a head similar to that of a drum or tambourine. It was invented by Joel Walker Sweeney, an American musician who, while traveling through the South with a wagon circus, had learned to play on the rude instrument of the plantation slave. This was a large, long-necked gourd, with a stick for a staff, over which were stretched four horsehair strings. Sweeney's first improvement on this rudimentary banjo was in the substitution of the tambourine-head for the gourd. This he made out of a meal-sifter, which he covered with old sheepskin. Several modifications followed; but it was not till he had added the fifth string, which he called the "thumb-string," that the real banjo of American negro minstrelsy was produced. The instrument has grown in popularity, and many varieties of it have been introduced, some having as many as nine strings. Sweeney often performed before Queen Victoria. He was born in 1813, and died in 1860. His grave is at Appomattox, Virginia, his native town.

BÁNK-BÁN, the name of a bán or chieftain of Hungary in 1214, who lives in Hungarian literature and has a romantic fame. His wife was seduced by Eckart, Queen Gertrude's brother, the queen aiding in the evil deed. Discovering the queen's participation, Bánk aroused the people to help him break into the palace and kill her. King Andreas II, returning from the war in Poland, put the bán to death. The story has been a favorite theme with poets of continental Europe. Perhaps the best treatment of it is in Joseph Katona's Hungarian drama, *The Bánk-Bán*, published in 1827, and rendered into German in 1858.

BANKES, HENRY (1757–1834), was educated at Westminster and at Trinity College. He was in Parliament from 1780 to 1824. He is the author of *Civil and Constitutional History of Rome from the Foundation to the Age of Augustus*.

BANKHEAD, JOHN PINE, an American naval officer; born in South Carolina, Aug. 3, 1821; he served at the bombardment of Port Royal, South Carolina, and commanded the gunboat *Florida* at the capture of Fernandina, Florida, in 1862, in the Civil War, and was in charge of the famous and ill-fated *Monitor* when she foundered off Cape Hatteras, Dec. 31, 1862, and filled the available boats with men, being the last to leave her deck. Promoted to the rank of captain in 1866, he died in the Gulf of Aden, while on his way home from the East Indian squadron, April 27, 1869.

*BANKING IN THE UNITED STATES. Charters of national banks in the United States were limited, by the act first creating them, to twenty years. In 1882 an act was passed by Congress, authorizing the renewal of a bank charter for another period of twenty years whenever two thirds of its shareholders desired this extension. Many who had opposed their creation on constitutional and other grounds were opposed to extending them, and urged a return to state systems of banking. The debate was long, but in the end a large majority in both branches of Congress was cast in favor of continuing the national system.

Had the national banks been dissolved, and state banks revived, the surplus of the former would have been divided among the shareholders. This had been accumulated by the operation of the requirement that one tenth of the annual net profits of every bank must be set aside for the creation of such a fund until equal to twenty per cent of its capital. The desirability of preserving this fund to meet the losses that are inevitable in banking was one of the strongest reasons for continuing the national bank system.

A prominent feature in the measure for continuing the banks related to the sale of shares of persons who did not wish to retain their membership. The law provided that the value of the shares of such a shareholder should be ascertained by three persons, one to be appointed by the bank, one by the shareholder and the third by the two appraisers. Within a given period after making the appraisal the shares were to be sold, and the owner was to be paid the sum received for them. If he were dis-



*Copyright, 1896, by The Werner Company.

satisfied with the appraisal, the law provided for another. Not many difficulties arose in reorganizing, as shareholders very generally were desirous of continuing their membership. Within two years after the law became effective, most of the earlier banks had accepted its provisions and had begun their second period of existence. Reorganizations are now occurring every year as banks complete their first period of life.

During the early years of national banking, as the banks could get all the bonds they wanted at par (for the government was desirous of selling them on these terms), profits were large, because the bank capital invested in bonds yielded good rates of interest, while the circulating notes based on the bonds were also loaned at a profit. But after the government ceased to be a borrower, and its bonds could only be purchased at a constantly rising premium, banks were unwilling to buy them at a high premium as a basis of their circulating notes. Besides, the banks were unwilling to risk a decline in the premium, for they might wish to sell their bonds. Subsequent events have shown that this fear of a decline was well founded. At one time a $100 four-per-cent bond commanded $130; four years afterward it could be bought for $116. Rather than pay high premiums, the banks preferred to invest their capital in other ways than United States bonds, even though deprived of their circulation. They had a right to pursue this course, for a law of 1882 permitted all banks having a capital within the limits of $50,000 and $150,000 to invest 75 per cent of it in other forms than national obligations. In other words, the law imperatively required banks having a capital not exceeding the larger amount mentioned to invest only 25 per cent in government bonds, while banks whose capital exceeded that amount were required to invest only $50,000 in that manner. With respect to its own needs, the government could safely make this change, for it was no longer a borrower. There was, however, one serious objection to the change, which has not yet been fully answered. The reason for creating the banks was to aid the government, which was to be done by taking and holding its bonds, and by providing a uniform and better currency for the people; but if they invest their capital in other than national bonds, they cease to be national in their character.

One effect of permitting banks to organize and invest 75 per cent of their capital in other forms than national obligations was to multiply their number. Many state and private banks were converted into national banks, especially in the Western and Southern states. By this change they assume a more public character, are subject to official examination, and their resources are better known.

For many years the government continued to pay the national debt rapidly, and many of the bonds called and paid were owned by the national banks. Whenever the bonds were called belonging to a bank two questions arose: Should it replace them with other bonds and continue to issue notes as before? or should it withdraw its circulation? If the amount called was so great as to reduce its capital invested in them below the minimum required by law, it was obliged to purchase others to comply with the requirement; in other cases a bank could either buy more or retire its circulation.

In many cases banks preferred to sell their bonds at the high premiums they commanded, than to hold and issue notes against them. The mode of proceeding was very simple. A bank deposited enough lawful money with the government to redeem the notes it wished to retire, and demanded a proportionate amount of bonds, which were delivered to it and afterward sold. From 1883 until 1891 the banks regarded this as the more profitable course. As every new bank was obliged to invest a portion of its capital in bonds, it issued as many notes as it legally could, and thus the national bank circulation was swelled to some extent by these new issues. Nevertheless, the increase from this source by no means equaled withdrawals by the banks, which preferred to sell their bonds and realize the premiums on them. The following table illustrates the decline in the national bank note circulation during the years mentioned:

| | |
|---|---|
| National bank notes outstanding Nov. 1, 1882 | $362,727,747 |
| Less lawful money on deposit | 38,423,404 |
| | $324,304,343 |

| | |
|---|---|
| Amount outstanding, less lawful money, etc Nov. 1, 1883 | $316,020,326 |
| Decrease during the year | 8,284,017 |
| Amount, etc., Nov. 1, 1884 | 291,849,650 |
| Decrease during the year | 24,170,676 |
| Amount, etc., Nov. 1, 1885 | 276,304,189 |
| Decrease during the year | 15,545,461 |
| Amount, etc., Nov. 1, 1886 | 219,710,656 |
| Decrease during the year | 56,593,533 |
| Amount, etc., Nov. 1, 1887 | 169,215,067 |
| Decrease during the year | 50,495,589 |
| Amount, etc., Nov. 1, 1888 | 152,366,328 |
| Decrease during the year | 16,848,739 |
| Amount, etc., Nov. 1, 1889 | 130,207,285 |
| Decrease during the year | 22,159,043 |
| Amount, etc., Nov. 1, 1890 | 124,958,736 |
| Decrease during the year | 5,248,549 |
| Amount, etc., Nov. 1, 1891 | 136,753,837 |
| Increase during the year | 11,795,101 |

In 1891 the tide turned, and since the increase in bank-circulation has been steady. This is the result, partly, of changing the character of the bonds, whereby some issues can now be bought at about par, and, consequently, without risk of loss. Another reason for the small withdrawals is that the banks have parted with nearly all the bonds they had commanding high premiums. When the banks were first created all of the government bonds bore 5 or 6 per cent; in 1896 the banks held only $11,997,000 of 6-per-cent bonds, $22,505,100 of 4½-per-cents, $163,198,850 of 4-per-cents, and $14,016,850 of 3-per-cents,—aggregating $211,717,800.

The national banks have not been altogether content in parting with the profits formerly accruing on their circulation. Many of the state banks also are not pleased with the nationalbank system, whereby they have been cut off from issuing notes. They contend that this is a hardship, if not an unconstitutional proceeding; and of late years, since the rates of interest have fallen so much, they have urged strongly the repeal of the ten-per-cent tax on the notes issued by state banks—which is prohibitory

in its effect—and a return to some form of state bank issues. This change has been urged for three reasons: to make the currency more flexible; to increase its amount, which they regard as too small; and to enhance their profits. It is admitted that the national bank currency lacks elasticity, or adaptability in quantity to the wants of the people. National banking is, indeed, a free system. It is no longer a monopoly, in the sense that individuals cannot organize national banks if they desire, as it was when the national bank note circulation was limited to $300,000,000. The amount that may be issued is now bounded only by the amount of national obligations that may be bought in the market. The practical working of the system has been to furnish the country with a fixed circulation like that prevailing in Great Britain. In law and in theory the circulation is self-regulating, as the people can organize banks and buy bonds and issue notes thereon; in effect, by reason of the high price of bonds or the difficulty in getting them, the amount of currency that could be issued has been limited.

It is contended by many of the best bankers in the country that the system is faulty, because no way is provided for increasing the amount in accordance with the demands of business. The briefest analysis of the function performed by a bank in lending money may be given to show the force of this objection to the present system. A man wishes to borrow money from a bank to pay for merchandise. He cannot give his note to the seller because he cannot readily give it to any one else in discharge of a debt that he may owe. Perhaps he would be willing to take it if he had ample means and could keep it until its maturity, but he wishes the buyer to give him something in the way of payment that he can readily transfer to others to whom he is indebted. So the buyer goes to a bank and offers to exchange his note possessing a limited credit for its notes which possess an unlimited credit. It is willing to do this for a fixed period, two or four months, for a reward known as interest. The exchange is made, the bank receives the buyer's note and gives him its notes possessing more general circulating power in return. These he takes to the seller, who readily accepts them in payment of the buyer's debt. It is contended that no system of bank-note issues is perfect which prevents a bank from making exchanges of this character to every person engaged in legitimate business. This is sometimes called an automatic system, and for its introduction many bankers are now contending.

A fundamental question in a free system, for which many bankers are contending, is, How is the payment of notes issued by a bank to be secured? Various suggestions have been offered at different times. When John J. Knox was Comptroller of the Currency, he suggested, in 1885, that a safety fund should be accumulated,—1. From the gain arising from the accidental loss or destruction of the circulating notes of national banks; 2. From the tax upon circulation; and 3. From a low rate of interest upon the fund on deposit in the Treasury for the purpose of redeeming the notes of national banks retiring circulation.

The most prominent plan of late years as a substitute for national bank notes is known as the safety fund plan, by which it is proposed that all the banks shall contribute annually a small sum to form a fund for redeeming the notes of any failed bank. Formerly, a fund of this kind was created by the banks of the state of New York, but not limited in its application to failed banks. The fund reached a very considerable amount, when three banks failed, nearly at the same time, and the fund was swept away and the system was discontinued. It is proposed to revive the system, limiting the operation of the fund to the payment of the issues of failing banks under government guaranty. An inquiry made of the Comptroller of the Currency in 1893 showed that the assets of all the national banks that had failed up to that time was nearly enough to pay their notes, the deficiency amounting only to $953,677. The friends of this plan argue from this experience, that if the notes of a failed bank constitute a first lien on its assets, any deficiency to be made up from the safety fund would be very small. This plan has met with more approval than any other, and it is probable that more will be heard of it in the future.

At one time it was feared that the national banking system would dry up, because of the rapid payment of the debt forming the basis of the existing bank-note circulation. Senator Farwell of Illinois proposed the substitution of other bonds for those of the government as a basis for bank-notes. Such a system would render the noteholder secure, but it was contended that it would be a strange business for the government to act as the guarantor of the obligations of individuals or institutions, and that the proper course for the government would be to issue currency of its own. Another objection, is that the amount of currency needed could not be properly regulated, whatever might be the intentions of the government. However, the increase in 1895–96 of the government debt, the issue of new bonds at lower rates of interest, and therefore purchasable at about par, and the slower future payment of public debt that is probable postpone the necessity for considering substitutes for national bank.

From the beginning of the national banking system in February, 1863, to December, 1895, 5,023 national banks were organized. Of these, slightly more than three hundred have failed, and their affairs been settled by receivers. The first year in which any considerable failures occurred was 1883. Much financial uneasiness was felt at the beginning of the following year, on account of the failure of railroad companies, the securities of which were held as collateral by the banks. In this emergency the New York Clearing-House Association, realizing that the country banks depositing with them would immediately demand their deposits, appointed a committee of five to receive from banks their bills receivable, and other securities approved by the committee, and to issue to them certificates of deposit bearing six per cent interest, not in excess of 75 per cent of the securities or bills thus deposited. These certificates were to be received in settlement of all balances at the clearing-house. This prompt action of the clearing-house stayed the panic, al-

though confidence was not immediately restored. The banks outside of New York City drew largely for their deposits, as was expected. Although the legal reserve of the New York City banks was drained below the limit of 25 per cent, they were enabled to collect their loans and make their reserve good.

In 1890 there was another panic. The banks located in speculative centers became involved in local enterprises. By 1890 a large portion of their means had been drawn into them. The first sign of the coming storm was seen in the conduct of foreign investors, who stopped investing, and began to sell in the New York market their bonds and stocks. While Western securities were thus suddenly thrown on the Eastern market for sale by foreigners, the demands on the banks of New York and other large eastern cities rose. Between the 28th of February and the 17th of May, nearly $45,000,000 of deposits were withdrawn from the 46 national banks of New York City. Of course they were obliged to curtail their loans. The excitement reached its height about the middle of November. To relieve the monetary stringency, the Secretary of the Treasury used almost all the available surplus in the treasury, in buying bonds. Between July 19th and Nov. 1, 1890, over $99,000,000 were disbursed in payment for United States bonds and interest on them. While this relief was timely, it did not restore confidence. The monetary stringency culminated on the 15th of November, but within a month its effects, to a considerable extent, had passed away. Yet a market for securities no longer existed, money could not easily be borrowed, credits were diminished, business became depressed, and the growth of cities and villages in many cases was arrested.

Again the New York banks resorted to the issuing of clearing-house certificates, and this measure was adopted in Boston and Philadelphia. In a few months the certificates were all retired. The amount issued by the associations of New York, Boston and Philadelphia were, respectively, $16,645,000, $5,065,000 and $9,655,000.

In 1893 there was another panic. More national and state banks failed, however, than during either of the other panics. Primarily, their suspension was caused by the action of depositors in withdrawing their deposits. With their withdrawal, loans were curtailed. Many of the suspended banks, after collecting their loans, were able to resume operations. Of the national banks which suspended, 65, having a capital of $10,935,000, were insolvent; 86, with a capital of $18,205,000, were able to resume business. Of the suspended banks, two were located in the New England states, three in the middle states, 38 in the Southern states, and 49 in the Western states. During the same period, 219 state and savings banks failed; of these, 54 resumed business; 19 loan and trust companies also failed, and 177 private bankers. Clearing-house certificates were issued by the associated banks of New York, Boston, Philadelphia, Baltimore and other places. The largest outstanding amounts were: New York, Dec. 13, 1890, $15,205,000; Boston, Dec. 6, 1890, $5,065,000; Philadelphia, Jan. 9, 1891, $29,140,000.

These suspensions and the demand of depositors for money once more gave special emphasis to the question of providing a way of getting out more notes readily to pay the demands of depositors. So long as they were withdrawing their deposits banks were afraid to lend their money, but the sudden cutting off of borrowers only deepened the seriousness of the situation, and this shadow will always be present until some method is devised of providing a way of quickly meeting the demands of depositors whenever they shall lack confidence in their institutions, or for other reasons demand the withdrawal of their deposits.

Many of the failures of state and national banks have been caused by the negligence of directors, and the measure of liability of state bank directors has often been determined by state courts. "They can only be regarded as persons who have gratuitously undertaken to perform certain duties, and who are therefore bound to apply ordinary skill and diligence, but no more." In no case have they been held liable unless they have been presumably guilty of some fraud on the corporation, or had known and connived at some fraud in others, or a fraud had happened which might have been prevented had they given ordinary attention to their duties.

The duties of national bank directors, beyond the prescriptions of statute, were determined in 1891, when the case of *Briggs* v. *Spaulding* finally reached the supreme court of the United States. One of the directors against whom the proceedings were directed was a member of Congress and a participator in the legislation creating national banks. Like so many other failures, the funds of the bank had been diverted into the channels of speculation by the president. Mr. Spaulding and most of the other directors were quite innocent of his operations; they had simply neglected to attend board meetings, and knew nothing of the affairs of the bank. The court laid down the rule, that directors must exercise such care as ordinarily prudent and diligent men do in their own affairs. The question of negligence was a question of fact to be determined by all the circumstances in each case. Four judges contended that a stricter rule ought to be established. The judges were so evenly divided that the question can hardly be regarded as definitely decided.

In the beginning, a national bank was not taxed in any manner whatever. As their capital was then entirely invested in government bonds, state taxation was deemed an attempt to tax the government itself. If this was beyond the taxing power of a state, so was any agency created to assist it in executing its duties. At an early day the supreme court decided that this could not be done. Afterward, however, Congress granted authority to the states to tax national bank shares at the place of location of the bank that issued them, but not at a greater rate than other moneyed capital in the possession of the individual citizens of each state, nor at a greater rate than was imposed on the shares of state banks.

Under this law a series of decisions has been rendered, of the highest importance. One of the

first questions to be decided was, whether, in determining the value of the shares of a bank, government obligations belonging to it could be deducted. If they could not be, it was contended the government itself was, in effect, taxed, and to permit a state to do this was dangerous and inexpedient. The highest court decided that the shares of a bank were not the same thing as the bank itself; its shares were the property of individuals, while the corporation was the owner of all its property, including its government bonds, as well as any real estate or other property it owned.

Having settled this question there followed a series of decisions relating to the validity of statutes passed by the states taxing these corporations. In many cases the national banks contended that the statutes discriminated against national banks and in favor of state banks and the moneyed capital of citizens. The terms on which permission by Congress was given to the states to tax national-bank shares seem plain enough, yet in making and executing the laws founded on this permission great difficulty has been experienced. Slight inequalities and discriminations are inevitable; how great must they be to transgress the national law? The question can never receive a final answer so long as statutes and the forms of property are changing.

While national banks fill the larger place in the business world, the state banks are influential, and possess a large amount of capital. Since the profits on circulation have declined, both kinds of banks have acted more nearly on the same level. One great advantage which the banks of many states, and also their trust companies, possess, is, that they are not obliged to keep any fixed reserve, like the national banks. In others, however, a different rule has recently been established. In the larger cities the national banks have had a great advantage in keeping deposits, permitted by law, of country national banks. These cannot be kept in any state bank. Were the law otherwise, many a national bank would long ago have retired from the system.

The administration of the national banking system by a special officer and assistants, and the frequent examination of national banks, has had the effect of subjecting the state banks to more regulations. It is true that in a few states, for many years, they have been required to make reports, to stand examinations and state supervision; but state supervision has now become general. In some of the states this extends even to the supervision of private banks. The right to extend state action so far has been contested, and the courts have rendered contradictory decisions, but there is no question concerning the right of the state to extend its supervisory power to corporations of its own creation.

After the profits on circulation shrunk almost to zero, a movement set in among the national banks to go back to their original condition as state institutions. One reason for doing this is to be free from some restrictions. One of these related to the certifying of checks. National banks are prohibited from certifying beyond the amount a depositor may have on deposit, or secured to the bank by adequate collateral. But if a bank can lend its credit, it is contended, why cannot it do this on a check as well as on a note? To this it is answered that a bank does not lend its credit except in the form of notes issued by itself or by other banks, amply secured by national bonds. Another movement among them worthy of note is the consolidation of two or more banks to lessen expenses. As banks cannot reduce expenses like factories, railroads or other plants, with the lessening of their profits consolidation seems to be the most effective method of restoring them.

Another fact worth noting is the organization of state bank associations in nearly all the states of the Union, especially since 1895. Meetings are annually held at which papers are read, generally of a practical nature, and business matters are discussed relating to taxation, the collection of checks, forgeries, and kindred matters. In some of the states the work of organization has gone still further; banks are divided into groups which meet annually, or oftener, for their mutual benefit.

Finally, it may be noted that for many years, while numerous bills have been introduced into Congress, hardly any of these have been enacted into laws. One of the bills, more frequently discussed than any other, endowed national banks with authority to issue notes to the par value of the bonds held as security for them. This bill has often passed either the House or the Senate, but has never reached the President. Whenever it has been before either body its enemies have always been present, thus showing the hostility that still exists in Congress to these institutions.

ALBERT S. BOLLES.

BANK-NOTE OR BANK-BILL is a promissory note payable to bearer on demand, issued by an incorporated bank under authority of law. At the present time, in this country, while any incorporated bank, whose charter so provides, may issue bank-notes, yet, on account of the tax of ten per cent which Congress has placed upon the issue of state banks, bank-notes are not issued except by national banks. National banks can issue notes to a certain limited amount, which amount is provided in their charter, and secured by government bonds owned by the bank, and deposited with the government treasury as security for the notes issued. Under this system the failure of the bank does not affect the value of its notes. Bank-notes are not looked upon as promissory notes in ordinary current transactions, but are recognized as money, and are a discharge of debts for an equal amount, if accepted by the creditor. They will, in a will or other instrument, pass under the word *money*, and for all practical purposes are money. Bank-notes in other respects are governed by the rules applicable to other negotiable instruments. and may be assigned by delivery. See BANKING, Vol. III, p. 315.

BANK-NOTE MANUFACTURE. The United States government has altered the designs of its paper money with frequency, the theory being that it was more difficult for counterfeiters to keep up with the changes. As a matter of fact, the result was that the average man saw so many different forms and designs, that it became possible for counterfeiters to raise bills of one dollar to the five or ten dollars denomination, and then impose upon

the public. To obviate this, the government now manufactures a series of bills, with appropriate designs, which it is intended to keep as permanent, so that the public will learn to note the difference between a one and a five or ten dollar note at a glance. In 1894 four prominent artists were given assignments to submit designs for these notes, and, as accepted, these designs have been executed, and in due season will appear on the government's side of the United States bank-notes. It is understood that the portrait idea has been abandoned on all these notes and that figures typical of the nation's greatness and industries are substituted.

The engraving of these notes will be divided up among a number of experts, the figure-work being given to those considered especially good in that branch, and the lettering to those excelling in that line of work, while the lathe-work will be done in sections. If a part of the lathe design is repeated twelve times, for instance, it is engraved but once, the parts being fitted together afterward with surprising accuracy. It is interesting to note, in this connection, that there are not more than about half a dozen engravers in the United States considered skillful enough to work on bank-notes for the government. Their ranks are recruited from time to time from those who obtain preferment in the engraving of similar work for private institutions.

BANKRUPTCY. Until the end of the year 1883 the bankruptcy laws of England remained substantially as described under BANKRUPTCY, Vol. III, pp. 341–345. The defects of the United Kingdom system were numerous and grave, as every creditor had long been aware. The chief evil of the Bankruptcy Act of 1869 was, that a dishonest debtor, with the aid of an irresponsible accountant, had in his hands a quick and inexpensive method, in the voluntary provisions clauses of the act, of defeating each and every remedy of his creditors. Then, after an easily passed whitewashing resolution, he could continue to trade and seek fresh credit with impunity. The curse of the entire act was the secrecy of its proceedings. A class of so-called accountants sprang up, who made it a business to seek trusteeships in liquidation proceedings, mainly with a view to sharing a debtor's estate with him. The open and notorious dishonesty of these persons was one of the strongest arguments urged for the passage of the Bankruptcy Act of 1883, and the recovery of their ill-gotten gains one of the first provisions of its clauses. The new act reverted to the system of officialdom and centralization, which, under earlier statutes and imperfect procedure, had been tried and given up. The entire control of matters in bankruptcy was given to the Board of Trade, and officials of the board, under the name of "Official Receivers," were placed in each county court district to act as assignees and trustees in every case of bankruptcy in the district. One most salutary and long-needed section rendered every undischarged bankrupt, who should incur a debt of one hundred dollars at any time before his discharge without at the time specifically informing his creditor of the fact of his being an undischarged bankrupt, guilty of a misdemeanor and severely punishable. One other serious defect of the older statutes was, that they failed to provide a method for an honest but unfortunate man to declare himself a bankrupt, and in so doing to protect his estate for the general body of his creditors. This was remedied by a section enabling any person unable to pay his debts to file a declaration of his inability to pay, and on such declaration to be adjudged a bankrupt. The procedure under the act is simple: the first result of a proper bankruptcy petition is the making of a receiving order by the court. It does not divest the debtor of his property, but suspends all suits and remedies pending against him. At the first meeting of his creditors, within fourteen days of this order, the debtor must make a proper and approved offer of composition, or his affairs will be administered in bankruptcy. In a bankruptcy, the official receiver is *ex officio* the trustee for the creditors, and if the estate is small, is the only person who can act as such. To meet the case of small debtors, the county court can administer the estate of a debtor harassed by petty debts, if his total indebtedness does not exceed the sum of two hundred and fifty dollars. In the main principles of bankruptcy law, the act of 1883 followed the lines of previous enactments, and in a similar way refused to release from debts incurred by fraud or from damages for wrongs done. In practice, the act of 1883 has been found to operate satisfactorily, its drawback, if any, being the heavy court fees imposed on those desirous of invoking its aid. According to the annual report of the inspector-general in bankruptcy for the year ending Dec. 31, 1894, the number of receiving orders made in England and Wales for the period of the report was 4,762, involving liabilities of $34,819,030, the assets realizing $11,746,335, and the estimated loss to the creditors being $26,920,865. The number of deeds of arrangement entered into in the like period was 3,894. As regards the causes of insolvency, the inspector-general reported the principal to have been the want of proper business capital and methods, improperly kept books, reckless trade credit given, and misplaced confidence in employees.

UNITED STATES. The Federal bankruptcy law of March 2, 1867, mentioned in the article on BANKRUPTCY, Vol. III, p. 344, as in operation was repealed June 7, 1878, the repeal to take effect as of and from Sept. 1, 1878. Since that time no Federal bankruptcy laws have been in operation in the United States. On May 2, 1896, a bill drafted by Judge Jay I. Torrey, passed the House of Representatives by a vote of 157 to 81, and was sent to the United States Senate. If the bill finally passes in its present shape it will provide "that any corporation, irrespective of the amount owed, may become a voluntary bankrupt. Persons, firms and corporations (except farmers and wage earners) who owe one thousand dollars or more, and have committed acts of bankruptcy, according to the evidence in a fair and impartial trial, before a jury if desired, may be adjudged bankrupts upon the petition of creditors.

"Acts of bankruptcy by a person (including firms and corporations) will consist in his having, within

four months prior to the filing of a petition against him, run away or stayed away to avoid service of civil process, and to defraud his creditors; failed for 30 days, or conditionally within such time, while insolvent, to secure the release of property levied upon for five hundred dollars or over; made a transfer of his property to defraud his creditors; made an assignment, or admitted his insolvency in writing and filed it in court; made, while insolvent, a preference; confessed a judgment to defraud his creditors; suffered, while insolvent, an execution for five hundred dollars or over to be returned no property found; or suspended and not resumed for 30 days, while insolvent, the payment of his commercial paper for five hundred dollars or over. Creditors need not proceed against a debtor who has committed acts of bankruptcy, any more than they need sue every debtor who is in default of payment.

"If the judgment in a bankruptcy suit is for the plaintiffs, the defendant will be adjudged a bankrupt. In that event he will retain the exemptions allowed by the laws of the state in which he lives, and if an honest man, will be discharged. If the judgment is for the defendant, the petition will be dismissed at the cost of plaintiff, as in other suits.

"The property of the bankrupt will remain in his possession until after the trial, unless the creditors shall give bond and secure its attachment; in that event the debtor may retain possession of his property upon giving a forthcoming bond.

"Claims will be proven by the simple oath of the creditors, and will be allowed on being filed in person or sent by mail, without the payment of any filing fee. If it is thought that an allowed claim is fraudulent, it may be suspended and investigated.

"Preferences are forbidden, and those which have been given may be set aside, if proceedings intervene within four months after they have been given. Valid liens are recognized and upheld by the bill; fraudulent ones will be set aside."

The advocates of a Federal bankruptcy law comprise the great mercantile concerns of the Union. The opponents are gathered from the remnants of states' righters and those in debt, danger or difficulties. The arguments for such a measure are cogent and simple. In the case of goods sold by an Eastern merchant to a trader in some of the Western and Southern states, remaining unpaid for, insuperable obstacles present themselves on any attempt at collection by legal process. The plaintiff, being resident in another state, is in the first place treated as an alien or person entirely outside the jurisdiction of the court in which suit is brought. Heavy bonds are required to be filed for costs in case of non-success. At the last, having combated successfully the natural prejudices of judge and jury against him, and being in possession of his verdict, the plaintiff would find its fruits rendered more than problematical by an exemption law, such as that of Texas, reserving from execution a debtor's homestead up to the value of five thousand dollars, that value being calculated at the date of original purchase, with no account taken of subsequent improvements nor appreciation of property. Nor is Texas alone in this respect, as many of the recently admitted states have designedly lax and wide exemption laws, in order to encourage the immigration of those who had been unfortunate in business, but had saved some money from the wreck. Again, the proceedings in bankruptcy in states where the law contemplates no evasion of justice, are so varied as to give rise to much irritation on the part of creditors. Often they would forego a debt rather than collect it by any available means, and hence they take refuge in curtailing and refusing credits, to the detriment of traders and borrowers in other states. The demand for a national bankrupt law arises out of the desirability of a uniform system for the whole country, thus placing all traders on an equality, and giving a firmer basis to the credit system.

BANKS ISLANDS, the name given to four groups of islands, in honor of Sir Joseph Banks. They are located as follows: 1. An island off the coast of British Columbia, near the Hecate Straits, containing some 300 square miles. 2. A considerable island in the Arctic Ocean, north of British America. 3. A small island in the Torres Straits, between New Guinea and Australia. 4. A cluster of small islands in the South Seas, seven in number, and forming the northern part of the New Hebrides group.

BANKS, JOHN, an English dramatist of the period of the Restoration; born about 1650; the author of *The Rival Kings* (1677); *The Destruction of Troy* (1678); *The Unhappy Favorite* (1682); *The Innocent Usurper* (1683); *The Island Queens* (1684); and *Cyrus the Great* (1696). He died after 1696.

BANKS, NATHANIEL PRENTISS, an American public man and soldier; born in Waltham, Massachusetts, Jan. 30, 1816. He received an ordinary school education, worked in a cotton factory, of which his father was superintendent, and learned the trade of machinist. Afterward he lectured, became editor of the local paper of his native place, studied law, and in 1849 was chosen to represent his native town in the legislature of Massachusetts. Mr. Banks advocated a coalition of the Democrats and the new Republican party, and was elected speaker of the state assembly in 1851, and re-elected in 1852. In 1853 he became chairman of the Massachusetts constitutional convention, and in 1853 was sent to Congress as a coalition Democrat. During his term he identified himself with the American or Know-Nothing party, and was re-elected to Congress. Later, after a protracted and bitter contest over the slavery question, he was chosen (in 1856) the first Republican speaker of the House of Representatives. Mr. Banks was again elected to the Thirty-fifth Congress by a large majority. He served until Dec. 4, 1857, when he was elected governor of Massachusetts. In 1858 and 1859 he was re-elected to that office, and while in office raised the efficiency of the state militia, in anticipation of a civil war over



GENERAL BANKS.

slavery. In 1860 he became president of the Illinois Central railroad. A year later, when the Civil War began, Mr. Banks was commissioned major-general of volunteers, and assigned to the command of an army corps in Virginia. His first military effort was made at the battle of Winchester, March 23, 1862. In April and May he was left with 8,000 men to guard the Shenandoah valley, but his advance division was driven out of Front Royal, May 23, 1862, by "Stonewall" Jackson. General Banks and his men escaped with difficulty, and three days later crossed the Potomac. On June 27, 1862, General Pope was placed in command of the army of Virginia, and early in August concentrated his forces near Culpeper Court House. On August 9th the corps of General Banks was ordered to the front, when the battle of Cedar Mountain was fought, which lasted into the night, without any decided result. Later, General Banks was placed in command of the defenses of Washington, while preparations were being secretly made to send a strong expedition by sea to New Orleans. He was assigned to command this expedition, which sailed from New York in November and December. On reaching New Orleans he succeeded Gen. B. F. Butler in command. He twice laid siege to Port Hudson, the first attempt failing. After six weeks of the second beleaguering, the news of the surrender of Vicksburg was received, and on the 9th of July, 1863, the garrison of Port Hudson, 6,000 in number, capitulated to General Banks. His Red River expedition, undertaken under orders, was checked by General Richard Taylor, and forced to a perilous retreat. On its conclusion in May, 1864, he was relieved of his command, resigned his commission, and returned to his native state, where he was biennially elected to Congress as a Republican until 1877, failing only in 1872. General Banks was long chairman of the committee on foreign relations. He afterward served as United States marshal for Massachusetts, and was again elected to Congress in 1888. He died Sept. 1, 1894.

BANKS, THOMAS, an early English sculptor; born in Lambeth, Surrey, England, Dec. 29, 1735; gained the Royal Academy gold medal in 1770, and completed his studies in Rome. His forte was the production of imaginative statuary. Of these his *Caractacus Pleading before Claudian*, *Psyche and the Butterfly* (purchased by Catherine II of Russia, who persuaded him to visit her dominions in 1784), and *The Mourning Achilles*, are considered his masterworks. He died in London, Feb. 2, 1805.

BANKS LAND, an island in the Arctic Ocean, 70 miles S.W. of Melville Island.

BANKSIA, a genus of shrubs of the family *Proteaceæ*. The species have hard, dry leaves, generally white, or very pale-green beneath, and present a remarkable appearance from the umbellate arrangement of their branches, which bear toward their extremities close cylindrical heads of numerous flowers. The flowers secrete much honey. They are natives of western extra-tropical Australia and Tasmania, forming a characteristic feature of its vegetation, and constituting much of the so-called "scrub."

BANK VAULTS. The manufacture of burglar-proof vaults has developed rapidly since 1880. The most recent construction provides for open space all around the vault, so that it cannot be attacked through side walls. The larger and stronger vaults are protected by a surrounding layer of steel rails, similar to railway rails, set facing alternate ways, and curved over the top and bottom of the vault in such a manner as to make access to the vault itself impossible within the limited time between banking hours. The walls of the vaults themselves are built of composite plates formed of alternate layers of soft iron or steel and of hardened steel. Such plates are commonly half an inch thick, and a five-ply plate is made up of two thicknesses of the hardened steel, and three of the softer metal. Outer plates are usually of double thickness. These plates are bolted together in an irregular fashion, so that the joints do not come opposite, and it is impossible to tell from the outside where the inner joints may be. The bolts are made of the same composite metal, layers of hard and soft steel, the result being that a wall so built up is very difficult of drilling, on account of the hardened plate encountered, while the soft metal in the plates gives them qualities that prevent fracture by wedging. The drilling, tapping, fitting, grinding, etc., of the plates are all done while the metal is soft. After the whole vault has been accurately fitted together it is taken down, and the separate plates are heated in a furnace to redness, and then dipped in water, preferably salt water. Next they have to be rolled, to straighten any warping incident to this hardening. After rolling, flattening and cleaning, they are ready to ship from the factory for erection.

The doors of large vaults often weigh four or five tons, and in order that one man may be able to swing them, the bearings of the hinges contain steel balls to reduce the friction. The time-locks are usually differently constructed for each large vault. One recently placed in the Mutual Insurance Building in New York has two doors, each controlled by three clocks. Unless all the six clocks should break down at one time, it is always possible to open the safe at the appointed hour.

BANNACK OR BONACK INDIANS, a tribe of North American Indians, sometimes called "The Robber Indians," inhabiting northern Montana, Wyoming and Idaho. They were forced southward by the Blackfeet, and in 1869 were assigned to the Wind River reservation. At this time the tribe consisted of 1,200 members, who were equally divided between the Wind River and Fort Hall reservations. By 1893 the majority of the Bannacks had left the Wind River district, the balance of the tribe, decimated as it had been by an epidemic of smallpox, being settled at Fort Hall and on the Lemhi reservation. In July, 1895, complaint was made by a few squawmen and cattle-rustlers that the Indians were infringing on the privileges of the settlers and killing moose and deer out of season. The Bannacks claimed a treaty right to hunt for food and to be outside the operation of any state game-law. On July 13, 1895, a constable and heavy posse, while conveying some Bannacks to Marysvale

for trial, alleged that they tried to escape. They fired on the unarmed Indians and slaughtered seven in cold blood. The United States marshal and the district attorney have stated that the evidence points to a deliberate assassination, unfortunately not cognizable in the Federal courts, and the injured were unable to obtain justice in the state courts on account of prejudice against the red men. As soon as the murders were known the Indians commenced to assemble near Salt River, and every squawman began to implore the aid of the Federal troops. General Coppinger, the commander of the department of the Platte, was ordered to the scene and found that the tales of war parties were the invention of interested parties.

BANNATYNE CLUB, a Scotch literary association, named after George Bannatyne, who flourished from 1545 to 1608. The famous Sir Walter Scott was the founder of the club; its objects were to promote the knowledge and study of Scottish antiquities, and to print valuable or rare antiquarian works. Originally, the club consisted of 31 members, but with its popularity it soon increased to 100 in number, at which it remained until its dissolution in 1861. A complete set of its 116 published volumes is rarely to be found outside of local libraries, and one set brought, in 1887, $1,145.

BANNISTER, HENRY, an American educator and clergyman; born at Conway, Massachusetts, Oct. 5, 1812; educated at the Wesleyan University, Middletown, Connecticut, and at Auburn (New York) Theological Seminary; professor and head of Cazenovia Methodist Academy, 1838–56; professor of exegetical theology in Garrett Biblical Institute, which later became the theological department of Northwestern University at Evanston. He died at Evanston, Illinois, April 15, 1883.

BANNOCK, a cake of home-made bread, common in Scotland. It is usually composed of peasemeal, or of pease and barley meal mixed, prepared without any leaven; it is baked on a circular plate of iron called a griddle. The bannock is doubtless of great antiquity, being, in fact, the primitive cake of many countries.

BANNS OF MARRIAGE. See MARRIAGE, Vol. XV, p. 566.

BANSHEE, a mythical female of Irish folk-lore, whose weird shrieks and wailings around a house are believed to portend a death in the family of the hearers. Credence in the personality of the banshee, and in the dread import of her warning, is deeply rooted among the superstitious and ignorant Irish peasantry. Some slight traces of bansheelore exist among the cotters of the western Highlands of Scotland. Instances of a similar superstition can be found in the folk-lore of almost every nation. The White Lady of the House of Hohenzollern, the specter of some monk slain by a crusading ancestor, and a score of similar death-warnings, have been collected by Dr. E. C. Brewer, under the head of "Warning-givers," in his *Reader's Handbook*. See CELTIC LITERATURE, Vol. V, p. 300.

BANTAMS, dwarf fowls kept for ornament or as pets, named after a decayed seaport of Java. During the last century many new varieties have been originated, and there are now bantams of all the principal breeds. The most curious are the dwarfed Asiatic fowls, cuckoo and Japanese bantams. The golden Sebright differs from the silver in being marked with yellow instead of white lacings. The game bantams are very fine, though not larger than a pigeon, the cock and hen weighing 24 and 20 ounces each. See POULTRY, Vol. XIX, p. 646.

BANTENG (*Bibos sondaicus*), a species of ox peculiar to Java and Borneo; in some respects it bears a marked resemblance to the gaur of India. It is captured by the natives, is domesticated and becomes very useful.

BANTING, a name given to a system for reducing corpulency, published in 1863 in pamphlet form by William Banting, a London undertaker, born in 1797, died in 1878. See CORPULENCE, Vol. VI, p. 436.

BANTU, the name applied to the languages and people of several African tribes inhabiting the region situated between 20° S. lat. and 6° N. lat. They are divided into three branches: the Kaffirs, the Zulus inhabiting the Galla and Somali country in the east, the Bechuanas dwelling in the central part, the western division being peopled by the tribes dwelling in the region between the Gulf of Guinea and the west coast of the Hottentot country. See PHILOLOGY, Vol. XVIII, p. 780; NEGRO, Vol. XVII, pp. 318, 319.

BANVARD, JOHN, an American artist; born in New York City, 1814, and educated in the schools of that city. He executed a panorama of Venice, and afterward one of the Mississippi River, and exhibited them in many cities as moving scenes. In order to accomplish the latter work he traveled in a skiff for thousands of miles. He also traveled in Europe, painted many pictures, published over 200 poems, several dramas, and, among others, the following works: *Description of the Mississippi River; Pilgrimage to the Holy Land;* and *The Private Life of a King*. He died in Watertown, South Dakota, May 16, 1891.

BANVILLE, THÉODORE FAULLAIN DE, a French author of poetical and prose works; born in Moulins, France, March 14, 1820. His first volume, *Les Cariatides*, was published in 1842; other of his writings are: *Rimes Dorées; Les Exiles; Les Occidentales; Trentes-six Ballades Joyeuses; Les Stalactites; Esquisses Parisiennes; Contes pour les Femmes; Comédies; Odes Funambulesques; Petit Traité de Poésie Française; Contes Féeriques; Mes Souvenirs;* and several plays. He died in Paris, March 13, 1891.

BANXRING, a squirrel-like, insectivorous mammal of the genus *Tupaia*, native of Sumatra, Borneo, India and Java. The genus is described under *Tupaiidæ*. See MAMMALIA, Vol. XV, pp. 401, 402.

BANYULS-SUR-MER, a seaport in the department of Pyrénées-Orientales, France, situated on the Mediterranean, near the Spanish frontier, 20 miles S.E. of Perpignan. The celebrated wine of Roussillon is produced in its vicinity. Near the town are four old towers, one of which marks the division between France and Spain. This place was the scene of many encounters between French republicans and Spaniards during the first French revolution. Population 1891, 3,119.

BANYUMAS, a town in Java, at the opening of a large valley on the left bank of the Serajo. See JAVA, Vol. XIII, p. 606.

BANZ, a Benedictine abbey, famous in history, situated in the midst of the finest Bavarian scenery, founded in 1058, and famed for the erudition of its monks. The convent was secularized in 1802, and now forms a summer palace for the king of Bavaria. A museum of petrifactions from near-by wells is of interest to the tourist.

BAOBAB TREE (*Adansonia digitata*), a gigantic tree of tropical Africa, named in honor of Michel Adanson; q.v. Though stunted in height, the baobab trunk is frequently 20 feet in diameter. The tree itself is very long-lived. De Candolle gave it a longevity of 5,000 years. See AFRICA, Vol. I, p. 268.

BAOUR-LORMIAN, PIERRE MARIE FRANÇOIS LOUIS, a poet; born at Toulouse, France, March 4, 1770. He translated Tasso and Ossian, and wrote several tragedies in the severest classic style. He was at one time the object of sarcasm and pithy raillery from the Romanticists, though the French Academy, which admitted him in 1815, evinced a profound respect for his talents. He died in Paris, Dec. 10, 1854.

BAPAUME, a fortified town of France, department of Pas-de-Calais, 14 miles S. of Arras. A portion of the allied troops under the Duke of Brunswick, marching to put down the French Revolution, advanced to this place after compelling the French to abandon their fortified position, and to retreat behind the Scarpe in 1793. Here, on Jan. 2 and 3, 1871, the German troops under Von Goeben vanquished the French, led by General Faidherbe. Population 1891, 3,001.

BAPTISTS, IN THE UNITED STATES. The same obscurity and diversity of origin attends the history of this denomination in America that is rehearsed in the article on BAPTISTS, in Vol. III, pp. 353–356, of this ENCYCLOPÆDIA. They were likely to spring up in any Protestant religious body, and in fact did so, sporadically, in widely separated parts of the country. In some instances they were imported, as in the case of the Dunkers and Mennonites, who came from the Palatinate and Holland to settle in the valleys of Virginia and the Susquehanna. At first the question of immersion was not the ground of separation from older denominations, for it is probable that Roger Williams was not immersed when he was rebaptized by Holliman. He and many co-religionists of his time were chiefly exercised over the baptism of infants, and came to reject the rite so administered as unwarranted and invalid. Hence they required the sacrament on a profession of faith, which no infant or idiot could make. For this reason they were called *anabaptists* by pædobaptists, or believers in the baptism of young children, because they rebaptized in such cases, and this is the signification of the Greek word. The term was, by tradition, an ignominious one, connecting those to whom it was applied with the turbulent sectaries of Germany in Luther's time. But when immersion was introduced, and the form of baptism became a dominant distinction, about the middle of the seventeenth century, the opprobrious name began to give way to the general and simple denomination of Baptists. Yet there have been many secessions from other churches, one of the justifications for which was immersion, that are not designated by this term. Thus several Adventist bodies, and the Disciples of Christ, or Campbellites, who are offshoots from Presbyterianism, practice immersion, but are not known as Baptists. If the distinction of adherence to immersion following a profession of faith is to be the basis of the name, the denomination will be much larger than is usually suspected.

Baptists, as ordinarily understood, and as classified in the United States census reports, are those who maintain a Congregational polity, and practice adult immersion. They may be either Calvinistic or Arminian in doctrine, and close or open communionists in respect to other denominations. Among them the Adventists (q.v., in these Supplements) adhere to their own general societies. With the others the grounds of union are local yearly meetings, associations or councils, and the support of great organizations for carrying on missions, publications and educational societies. No particular congregation is bound to adhere to these combinations by any bond of discipline or charter, but may withdraw at pleasure, on Congregational principles. The denomination is divided, by adherence to local associations, into three branches of "Regulars,"—one in the North, a second in the South, the third for "colored" persons; into two bodies each of "Free-will" and "Primitive" Baptists; and into six other smaller bodies, variously distinguished.

It is usual to attribute the beginning of the Baptist denomination in America to Roger Williams, and his settlement at Providence, Rhode Island. The story is, that, rejecting infant immersion, he himself was baptized by aspersion by one Ezekiel Holliman, and in turn baptized 11 others, who formed the first church of the denomination in the colonies. The same year, 1639, John Clark arrived at Newport and established a Baptist congregation there. To Mark Lucar, an immigrant of 1644 from England, is attributed the introduction of immersion as the characteristic rite of this denomination. He was a Particular Baptist, as those religionists were called who held to the high Calvinistic doctrine of an atonement particularly for the elect. It is out of these Particular Baptists that the great body of this denomination in the United States grew into doctrinal form, unity and polity.

A division of this body appeared in 1652, in Providence, when Chad Brown established a congregation of General Baptists, the term *General* implying adherence to the doctrine of a general atonement for the sins of mankind. These General Baptists were largely tinctured with Arminianism, if not wholly adherent to that body of theology. In the early part of the eighteenth century the congregation of Williams was extinct, and the Brown party was in the ascendancy in Rhode Island. This condition of things was destined to be soon reversed, and that through the agency of the Philadelphia Association. After some contention in that association of the two parties, the Particular Baptists came into overwhelming preponderance. This Philadel-

phia Association is known to have been in existence in 1707, and then as distinctively Calvinistic in its views. It had more zeal of propagation than any other body in the denomination, and its agents disseminated its views in Rhode Island and in the Carolinas. Through its operations, chiefly, the great denomination of American Baptists became so united in doctrine and polity as to be known by the epithet of "Regulars,"—a term that here implies magnitude, or the largest association and uniformity.

In their relations to the state the Baptists are characterized by an ancient, resolute and consistent defense of freedom of conscience, or, to use a phrase common amongst them, of "soul-liberty." A refugee from the ecclesiastical tyranny of Massachusetts, Roger Williams, by force of his position, was a stout maintainer of the sacredness of religious opinion from all interference by civil authority. He founded his colony upon the doctrine that the relations of a man's soul to God were absolutely personal, and that no human authority could rightly prescribe a religion or punish a man for obedience to his religious convictions. At that time such an opinion seemed to the colonies, most of which had religions established by law, a seditious dogma, and in New York Baptists were driven into exile; in New England, Virginia and Georgia they were prosecuted, fined, whipped and imprisoned. At the adoption of the United States constitution, when it was proposed to inhibit Congress from imposing religious tenets upon those who held office under the government, an influential body of the Baptists met in Richmond, Virginia, in 1789, protesting against restricting this liberty to officers, and demanding it as the right of all men. The issue was the adoption of an amendment to the constitution, proposed in the First Congress, to this effect: "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof." The consistent defense of this utter separation of church and state has always formed one of the most honorable characteristics of the Baptists. Of those who do not adhere to what are termed the Regular Baptists some brief account must now be given.

Free Baptists. Benjamin Randall, of New Hampshire, was converted by the preaching of George Whitfield, and in 1776 united with the Baptist congregation in Berwick. He began preaching the doctrine of general atonement and the innate capacity of fallen man to accept salvation. It led to a separation in the New Hampshire Association, the Arminian party following the lead of Randall, from whom fellowship was withdrawn in Berwick. Their first church was established at New Durham, New Hampshire, in 1780, and eventually took the name of Freewill Baptists. Their first quarterly meeting was organized in 1784; their yearly meeting of delegates from the quarterly associations in 1792, and their General Conference of delegates from the yearly meetings in 1827. The General Conference is a triennial body. In 1841 a small division of Free-Communion Baptists, which also sprang up under the influence of Whitfield's preaching, incorporated itself with the Freewill Baptists. This united body, which is Arminian in doctrine, discarded foot-washing as a religious obligation, and adopted antislavery views in politics. Before the Civil War they refused fellowship with slaveholding Baptists in North Carolina and Kentucky, and not until peace was established were they able to extend their organizations into the South. Among their educational institutions are Bates College and Cobb Divinity School, in Maine, and schools of a collegiate character at New Hampton, New Hampshire; Hillsdale, Michigan; and Harper's Ferry, Virginia.

General Baptists. It has already been stated that the name *General Baptists* implies belief in a general atonement, and substantially in Arminian theology. Churches holding these views were common in the Carolinas, Virginia and Maryland prior to the ascendancy gained in these states by the Philadelphia Association. Separate congregations there were not swept into the great Particularistic movement, but not until 1824 did the congregations they had fostered combine in a new association in Kentucky. In New England a similar resistance to the progress of the Particularists resulted in what are termed the Six-Principle Baptists, so called for their adherence to the six principles mentioned in Heb. vi, 1, 2. They form a body, chiefly to be found in Rhode Island, Massachusetts, New York and Pennsylvania, of meager cultivation and small enterprise. They seem to be gradually declining, and in 1890 had a membership of scarcely 1,000. Still another branch of Freewillers exists in the Carolinas, and bears the name of Original Freewill Baptists,—a term that sufficiently indicates their history. They regard the washing of feet and the anointing of sick with oil as rites of religious obligation, hold to the salvation of such as die in infancy, to a general atonement and to immersion on profession of faith. They have a membership of about 12,000. The larger body of Freewill Baptists are known as adherents to open communion; that is, unlike most of the Regular Baptists, they do not regard immersion as a necessary prerequisite to participation in the Lord's Supper.

Separate Baptists. The revival which attended Whitfield's preaching in the United States profoundly stirred the Baptist denomination; owing thereto, congregations were formed which separated from the regular body on the ground of simple adherence to the Whitfield tradition. Of these Separates, many have returned, from time to time, to unite with the Regular Baptists, but a small section still exists, which rejects the doctrine of election and reprobation. Their churches are to be found only in Indiana, and have a membership of less than 2,000. They are in practical accord with the Free Baptists.

Seventh-Day Baptists. This body differs from the Regulars only in regard to the proper day to be observed as the Christian Sabbath. It is their belief that the fourth commandment is not abrogated, and that the seventh day of the week should be observed as the day of rest. Some of them contend that a proper interpretation of the gospels proves the resurrection of Christ to have occurred

upon that day, rather than upon the first day of the week. Adherents of this view in England, in the sixteenth century, took the name of "Sabbatarians." This branch of the Baptists first appeared in America at Newport, Rhode Island, where they were strong enough to organize a church in 1671. They extended their congregations in Rhode Island, and to some extent in New York and New Jersey. Early in the eighteenth century they were strong enough to establish yearly meetings, and early in the nineteenth, general conferences, now held triennially. In 1818 they adopted the title of Seventh-Day Baptists. In 1885 there were five associations: those of Ohio and Virginia, the Eastern, Central and Western. They practice total abstinence, support their own foreign missions, control Salem College, Virginia, Milton College, Wisconsin, and Alfred University, New York, and have a membership of about 10,000.

United Baptists. These are a body which had its origin in the revival led by Whitfield, already mentioned. They appeared about the middle of the eighteenth century, and are now principally found in the Southwestern states. They were once joined by some considerable number of members of the Regular Baptists, which gave rise to the name *United*. They are substantially Calvinistic, except in reference to freedom of will, which, they assert, exists in men to the extent of enabling them to choose or reject salvation, and to the view of an unrestricted atonement. With them foot-washing is an obligatory ceremony. They are a small body, numbering about 10,000.

It remains to notice two other bodies, conspicuous for their adherence to an extreme type of Calvinism.

Old Two-Seed-in-the-Spirit. Predestinarian Baptists. This body exists mostly in the Southwest of the United States. Their name denotes that they hold to the seed of death implanted in man by his fall from primitive holiness, the fruit of which is death, and the seed of life implanted by the Holy Ghost, the fruit of which is eternal life. They hold with vigor to the five points of Calvinism, regard the church as the spiritual kingdom that excludes all worldly authority, and practice foot-washing. They number about 10,000 members.

Primitive Baptists. This body separated from the Regular Baptists at Chemung, in New York, in 1835. The next year a second association was formed at Baltimore, and in 1840 a third at Warwick, New York. This body has propagated its views with considerable zeal, and the denomination now exists in the District of Columbia and in twenty-four states, although its strength lies principally in Illinois and Indiana. It is opposed to human agency in religious affairs, as reflecting upon God's sovereignty. It discountenances Sunday schools, missions, educational societies and other forms of propaganda. The position is in strict logical accordance with extremest Calvinism. They hold that it is wrong for believers to participate in politics or other functions of organized worldly society, and that their church alone has the divine order and sanction, hence they are also known as Anti-Mission. The term *Primitive* seems to indicate an assumed following of the Apostolic age. They are also called Regular or Old-School Baptists. They number about 100,000 members, and have nearly 3,000 congregations.

The Baptists of the world numbered, in 1895, 4,447,074, and had 46,520 churches and 32,447 ministers. They were distributed as follows:

| | Churches. | Ministers. | Members. |
|---|---|---|---|
| North America | 41,227 | 28,475 | 3,856,584 |
| South America | 18 | 14 | 729 |
| Europe | 3,965 | 3,121 | 454,520 |
| Asia | 1,017 | 593 | 111,177 |
| Africa | 63 | 91 | 5,973 |
| Australasia | 230 | 153 | 18,089 |

The American Baptist denomination in the United States had, in 1895, associations in 50 states and territories, and included 1,551 associations, 27,774 ministers, 40,064 churches and 3,720,235 members. There were also 23,302 Sunday schools, with 1,779,886 pupils. The total valuation of church properties was $81,648,246; and contributions to the funds of the church, $11,755,118. The Society maintains 31 charitable institutions, which include hospitals, homes for the aged, orphans, etc. The investment in these properties was $1,525,721. The Society publishes 122 periodicals, covering all lines of church-work. The general society has under its auspices 169 educational institutions, which are classed in five groups, as follows: 1. Theological seminaries, 7, with 67 instructors, 1,002 students, and property valued at $3,774,850. The principal ones are the Divinity School of the University of Chicago, Rochester Theological Seminary, New York, and South Baptist Theological Seminary, Louisville, Kentucky. 2. Institutions for higher education, 36, with 807 instructors, 11,523 students, and property valued at $22,722,163; about two ninths of the students are taking preparatory work. Chief among these schools are Brown University, Rhode Island; Bucknell University, Pennsylvania; Colby University, Maine; Columbian University, District of Columbia; and University of Chicago. 3. Seminaries for women exclusively, 29, with 370 instructors, 2,099 students, and $4,063,297 worth of property. Vassar College, New York, Shepardson College, Ohio, and Southern Female College, Georgia, are among the principal ones. About one fifth of the students are in the preparatory departments. 4. General academies, both co-educational and for men exclusively, 64, with 530 instructors, 14,341 students, and property valued at $4,167,730. Over four fifths of the students are in the preparatory departments. Principal among the institutions of this class are Temple College, Philadelphia, Pennsylvania; Mars Hill College, North Carolina; Cedar Valley Seminary, Iowa; Pillsbury Academy, Owatonna, Minnesota; and Williamsburg Institute, Kentucky. 5. Institutions for negroes and Indians, 33, located, with few exceptions, in the Southern part of the United States, with 293 instructors, 5,326 students, and property valued at $1,398,830. Bishop College, Texas; Shaw University, North Carolina, and Spelman Seminary, Georgia, are the chief institutions of this class. The denomination has the following general societies through

which all the practical work of the Church is carried on: 1. American Baptist Missionary Union, organized in May, 1814; headquarters, Boston, Massachusetts; receipts in 1895, about $662,000; expenditures, about $852,000. In mission-work there were engaged 2,220 ministers, 1,653 churches, and 190,998 members. This society is for foreign work. 2. American Baptist Home Mission Society, organized April 27, 1832; headquarters, New York City; churches aided in the erection of edifices, 89; schools for Indians and negroes supported in 11 states; receipts for 1894, about $515,000; expenditures, about $455,000. 3. American Baptist Publication Society, organized Feb. 25, 1824; headquarters, Philadelphia; during 1894, 33,632,000 copies of periodicals were issued; receipts, about $795,000; expenditures, about $807,000. 4. Southern Baptist Convention; organized May 8, 1845; headquarters, Richmond, Virginia; Atlanta, Georgia; and Nashville, Tennessee; receipts for foreign missions, about $125,000, and expenditures, about $237,000; for home missions, receipts, about $89,000, and expenditures, about $138,000; 702 associations in 14 states, 9,907 ministers, 17,803 churches, 1,431,041 white members, and 1,317,130 negro members. 5. American Baptist Education Society, organized May 16, 1888; headquarters, New York City; receipts for 1894, about $21,000; expenditures, $20,000. 6. Baptist Young People's Union of America, organized July 7, 1891; headquarters for 1895, Chicago; receipts in 1894, about $58,000; expenditures, about the same. The women's societies are as follows: 1. Woman's Baptist Foreign Missionary Society, organized April 3, 1871; headquarters, Boston, Massachusetts; receipts, about $98,000; expenditures, about $96,000. 2. Woman's Baptist Foreign Missionary Society of the West, organized May 9, 1871; headquarters, Chicago; 23 auxiliary societies. 3. Woman's Baptist Home Mission Society, organized Feb. 1, 1877; headquarters, Chicago; 2,184 auxiliaries, inclusive of children's societies; receipts for 1894, about $64,000; expenditures, about $63,000. 4. Woman's American Baptist Home Mission Society, organized Nov. 15, 1877; headquarters, Boston; receipts in 1894, about $38,000; expenditures, about the same. 5. Woman's Missionary Union, auxiliary to the Southern Baptist Convention, organized May 14, 1888; receipts in 1895, about $88,000. The American Baptist Historical Society, organized May 5, 1853, for collecting data in regard to the growth of the church, has had its work to do over, since the fire of 1896 in the publication society's building in Philadelphia, and in which the documents were all destroyed.

D. O. K.

BAR, any elongated piece of wood, metal or other solid substance. In the iron manufacture, bar is a rod either round or square-shaped. The round ones are made by passing the iron red-hot through a bore or hole in a plate, and the square ones by passing it likewise red-hot through a rolling-mill between two rollers counter-grooved, with their triangular grooved faces forming the square opening for the passage of the iron.

In hydrography, the term imports a ridge opposite the mouth of a river, formed when the larger body of water arrests the current of the tributary and compels it to deposit the mud and sand which it has brought near its own mouth. A bar soon forms a delta, as in the cases of the Mississippi and Nile rivers. The term is also used to signify any deposit of silt or other matter in a river bed.

In music, the word *bar* is a term applied to a vertical line dividing measures on the staff, and indicating that the strong beat falls on the note immediately following; hence the term has come to mean a measure of music.

In heraldry, one of the diminutives of the fess. The bar, like the fess, is formed by two horizontal lines passing over the shield; but it differs from it in size, the fess occupying a third, the bar only a fifth part of the shield. See HERALDRY, Vol. XI, p. 694. The term is frequently misused, as "bar sinister," instead of baton sinister, as an heraldic mark of bastard birth.

The term has also its legal use. It signifies the partition or railing in a court of justice at which prisoners stand to plead or be sentenced, and in front of which the members of the legal profession are generally seated. A trial at bar in England, previous to the sweeping reforms of procedure introduced by the judicature acts of 1873 and 1875, was a trial before several judges instead of a single judge. A complete defense in law to an action, when placed in the form of a plea, is termed a plea in bar.

Lastly, the term is used to denote the counter in a saloon or hotel at which beer and spirituous liquors are sold.

BARABA OR BARABINSKA, one of the great steppes of western Siberia. First settled by Russians in 1730. See TOBOLSK, Vol. XXIII, p, 429.

BARABOO, a city and county seat of Sauk County, in southern central Wisconsin; situated on the Chicago and North-Western railroad, 35 miles N.W. of Madison, about 3 miles from the noted Devil's Lake, and on the banks of the Baraboo River; iron-mining, grain, fruit, and hop raising are carried on. Population 1890, 4,605; 1895, 5,484.

BARACOA, a decayed seaport town on the north-east coast of Cuba. In its vicinity is a remarkable mountain called "The Anvil of Baracoa."

BARADA, a Syrian river which flows through the city of Damascus. Before reaching the city it divides into several branches; two of these are thought to be the Abana and Pharpar of the Bible. See SYRIA, Vol. XXII, p. 821; and ABANA, in these Supplements.

BARADLA CAVE, a remarkable stalactite grotto. See AGTELEK, Vol. I, p. 420.

BARAGA, FREDERICK, a Roman Catholic missionary; born in Treffen, Austria, June 29, 1797; died at Marquette, Michigan, Jan. 19, 1868. He came to the United States and devoted his life to work among the Indians, laboring among the Ottawas of Michigan, and the Chippewas at La Pointe. Was made bishop of Sault Sainte Marie in 1857, and in 1865 had Marquette added to his see. He wrote works of devotion in the Ottawa and Ojibway languages; *The History, Character, Manners and Customs of the North*

*American Indian* (in German); and a grammar and dictionary of the Ojibway language.

BARAGUAY D'HILLIERS, ACHILLE, son of the Louis sketched in succeeding article, was born in Paris, Sept. 6, 1795, and entering the army in 1812, next year lost his left hand at the battle of Leipsic. He had important commands in Algiers and Italy up to 1854, when he received, during the Crimean War, the command of the Baltic expedition, and on the capture of Bomarsund, where his force co-operated with the British, he was made a marshal of the empire. In the Italian campaign of 1859 he distinguished himself at Solferino, and during 1870 he was for a brief time commander at Paris. He died at Amélie-les-Bains, France, June 6, 1878.

BARAGUAY D'HILLIERS, LOUIS, a general of the French Empire, born in Paris, Aug. 13, 1764. He received an appointment in the army of Italy from Napoleon, and was a sharer in all the campaigns of 1796–97. He was made a general of division, and under Napoleon's treaty with the Venetian Republic, May 16, 1797, commandant of Venice. He accompanied the expedition to Egypt, and afterward successively held appointments in the armies of the Rhine, the Tyrol and Catalonia. He headed a division in the Russian campaign of 1812, but on the retreat he incurred the displeasure of Napoleon. He was sent as prisoner to Berlin, where he died, Jan. 6, 1813.

BARANTE, AIMABLE GUILLAUME PROSPER BRUGIÈRE, BARON DE, a French statesman, historian and general writer; born at Riom, France, June 10, 1782; son of Claude Ignace Brugière, Baron de Barante. He held several offices under the Empire and Restoration; was ambassador to Turin and St. Petersburg under Louis Philippe. His principal literary works are *A History of the Dukes of Burgundy of the House of Valois;* a *History of the National Convention;* and translations from Shakespeare and Schiller. He died at Puy-de-Dôme, France, Nov. 22, 1866.

BARATARIA BAY, an inlet of the Gulf of Mexico, in the state of Louisiana, between the Mississippi and the Bayou la Fourche on the west. It is about 12 miles long by 6 broad, with swampy shores, and once was a refuge of pirates. Fort Livingston, on the west end of Grand Terre Island, forms a naval defense, and a lighthouse on the same island marks the entrance to the bay. There are only seven feet of water on the bar.

BARATIERI, ORESTE, an Italian lieutenant-general, the former civil and military governor of Eritrea, the Italian colony in Abyssinia; born in 1841, in Condireo, Italy, and fought with Garibaldi in Sicily in 1860. Appointed governor of Eritrea in 1892, he restored order; and in July, 1894, avenged an attack made by the dervishes on Agoldat in his absence in November, 1893, by marching on their citadel at Kassala, routing them and taking possession of their stores. In November, with 3,600 troops, he suppressed an armed rebellion of 10,000 Abyssinians, and strengthened the Italian protectorate. On March 1, 1896 the troops under General Baratieri's command suffered a terrible reverse near Adowa. Generals Albertone and Dabormeda were killed, while 5,000 men and 60 pieces of artillery and immense stores of war fell into Abyssinian hands. Popular indignation in Italy took the form of severe riots, and General Baratieri was recalled to be tried by courtmartial. He was acquitted.

BARB, a name applied to a breed of horses originated by the Moors of Barbary. For several celebrated horses of this breed, see HORSE, Vol. XII, pp. 182, 183.

BARBADOS CHERRY, the name given in the West Indies to the fruit of two small trees, *Malpighia urens* and *Malpighia glabra*, which are cultivated for its sake. Clusters of fruit, which resemble cherries, are produced from the axils of the leaves.

BARBADOS GOOSEBERRY (*Pereskia aculeata*), a West Indian fruit, having expectorant properties. See CACTUS, Vol. IV, p. 626.

BARBADOS TAR OR PETROLEUM, a dark, inflammable, viscous liquid which, by distillation, yields naphtha, with asphalt as a residuum.

BARBARA, SAINT, who suffered martyrdom at Nicomedia, in Bithynia, about A.D. 236, or, according to other accounts, at Heliopolis, in Egypt, about 306; was of good birth, and well educated by her father, Dioscorus. To avoid disturbance in her studies he had a tower built for her, where she spent her youth in solitude. While in this retirement she was led, through Origen, it is said, to embrace Christianity. Her father, a fanatic heathen, learning of his daughter's conversion, and failing to induce her to renounce Christ, delivered her up to the governor, Martianus, to be dealt with by the law. Martianus, struck with the intelligence and beauty of the maiden, attempted, first by arguments, to make her relinquish Christianity, but when that failed he had recourse to the most refined tortures. At last the father himself offered to strike off his daughter's head. Scarcely was the deed done when he was struck by lightning. Hence Saint Barbara is to this day besought for aid in storms. She is the patron saint of artillery, and her image was at one time frequently placed on arsenals, powder-magazines, etc. The powder-room in a French ship of war is to this day called Sainte-Barbe.

BARBAROUX, CHARLES JEAN MARIE, one of the most energetic of the Girondists, was born in Marseilles, France, March 6, 1767. The new ideas of equality and fraternity found in him a warm advocate, and he was elected special delegate of Marseilles to attend the constituent assembly at Paris. He returned to his native town, and was soon after chosen delegate to the convention of 1792. While there he adhered to the Girondists, and boldly opposed the party of Marat and Robespierre. In May, 1793, proscribed as a royalist and an enemy to the republic, he wandered about the country, hiding himself as he best could, but he was finally taken, and perished at Bordeaux by the guillotine, June 25, 1794. He understood the revolutionary crisis much better than most of his party, and had they all had his prudence, much bloodshed and horror would have been spared France.

BARBARY APE (*Macacus Inuus*), also called MAGOT or PIGMY APE, is found in but one place in Europe, the Rock of Gibraltar. It is not much

larger than a good-sized cat, is tailless, gray or greenish gray in color, easily domesticated and very agile. Its natural habitat is in the forests of northern Africa, where it abounds. Its fondness for eggs is believed to have furnished the basis of the ancient story of the battle between the pigmies and the cranes.

BARBECUE, the roasting, usually in the open air, of a whole ox or other large animal. It is a Southern word and is believed to have come from the Haytian word *barbacoa*, which means the wooden frame upon which meats are smoked. In the United States the word is used of social and political festivities, where whole roast animals and other provisions are lavishly provided. Barbecues, once a favorite method of celebration or political jollification, are falling into disuse, though open-air entertainments where drink and roast meats may be obtained are still frequent in the Southern states.

BARBEE, WILLIAM JOHNSON, physician and writer upon scientific and religious subjects, was born in 1816, at Winchester, Kentucky; died there, Oct. 27, 1892. Among the Disciples of Christ he was well known as a teacher and preacher. For ten years he practiced medicine in Cincinnati; wrote *The Physical and Moral Aspects of Geology* and *The Cotton Question.*

BARBEL, a name given to a fish of the genus *Barbus*, belonging to the carp family (*Cyprinidæ*). Four barbels project downward from the snout and lower jaw, and serve to plow up the mud of the river bottom when the fish is in search of food. In general appearance it resembles the ordinary sucker of the United States. It often reaches a length of 30 inches and a weight of 12 pounds. The barbels are common in European rivers and in the Nile. See MAHASEER, Vol. XV, p. 285.

BARBER, JOHN WARNER, historical writer, was born at Windsor, Connecticut, in 1798; died there, June, 1885. Among his works are *Incidents of American History; History of New Haven; Elements of General History; Our Whole Country;* and *Historical Collections* of Connecticut, Massachusetts, New Jersey, New York, Virginia and Ohio.

BARBERRY, a shrub of a genus (*Berberis*) of plants of the family *Berberidaceæ*. All the species, which are numerous, and found in temperate climates in most parts of the world, except in Australia, are shrubs, with yellow flowers having a calyx of six sepals, a corolla of six petals, and six stamens, which, when touched at the base, display a considerable degree of irritability, starting up from their ordinary position of reclining upon the petals, and lying toward the pistil,—a provision to secure cross-pollination by dusting the bodies of visiting insects. The fruit is a berry with two or three seeds. Many of the species are evergreen. The common barberry (*Berberis vulgaris*), a native of most of the temperate parts of Europe, Asia and North America, produces its flowers and fruit in pendulous racemes. Some of the evergreen species are employed for hedge-plants, as *Berberis dulcis*, the sweet barberry, a native of the southwest coast of America.

BARBER'S ITCH, the name given to two diseases: (1) *Sycosis non-parasitica.* When there is a pustular eruption caused by too close or frequent shaving. (2) *Tinea Sycosis.* Here there is ringworm in the hair of the beard, caused by using unclean or contaminated razors, etc. The disease can usually be cured by perfect cleanliness and the use of soothing ointments, such as lotions of glycerin or acetate of lead. In serious cases of *Tinea sycosis*, where the hairs become infected by a whitish parasite, such hairs should be pulled out and diluted sulphurous acid or corrosive sublimate should be used as a wash.

BARBERTON, a town of the Transvaal, Africa, about 300 miles N. of Durban. It is named after a prospector of the De Kaap gold-fields, and is the headquarters of the mining industry of that region. See TRANSVAAL, Vol. XXIII, p. 518.

BARBÉS, ARMAND, a French revolutionist; born in Guadeloupe, Sept. 18, 1809; died at The Hague, June 26, 1870. On charges which were not substantiated he was imprisoned from 1834 to 1835, and again in 1839. For an attempt to overthrow the national assembly in 1848 he was sentenced to imprisonment for life, but was released in 1854. He wrote a volume entitled *Deux Jours de Condamnation à Mort.*

BARBET, a bird of the genus *Laimodon*, allied to the woodpeckers. The name refers to the bunches of bristles surrounding the conelike bill. They are gaily plumaged, and largely insectivorous. The barbets inhabit warm regions, especially Africa.

BARBET, a variety of poodle-dog. It is very active, intelligent, faithful to its master, cross with strangers, and quite liable to disease.

BARBET DE JOUY, JOSEPH HENRI, archæologist, was born at Couteleu, France, July 16, 1812. He became administrator of the national museums by decree of March 1, 1879. He has edited numerous manuscripts found among the collections placed in his charge. *Les Gemmes et Joyaux de la Couronne* is the most important of these; has also published a *Description of the Statuary of the Middle Age and of the Renaissance in the Louvre.* He is an officer of the Legion of Honor.

BARBEY D'AUREVILLY, JULES AMÉDÉE, novelist, was born St. Sauveur-le-Vicomte, France, Nov. 2, 1808, and died in Paris on the 23d of April, 1889. In his novels he romanced with little restraint on a vulgar imagination, and hence, perhaps, they were lauded by critics and readers of coarse taste. Among those most popular were *Le Chevalier Destouches; Les Œuvres et les Hommes; L'Ensorcellés,* and *Une Vieille Maîtresse.*

BARBIER, PAUL JULES, dramatist, was born in Paris, March 8, 1825. Since the production of his first successful work, *Le Poète,* at the Théâtre Français in January, 1847, he has written a very great number of plays and librettos for grand and comic opera. Among his successful comedies and dramas are *L'Ombre de Molière; Le Feu de Paille; L'Amour Mouillé; Voyage Autour d'une Jolie Femme; Princesse et Favorite;* and *Néron.* He became an officer of the Legion of Honor, July 12, 1880.

BARBIER DE MEYNARD, CHARLES ADRIEN CASIMIR, Orientalist, was born in Marseilles, France, on the 6th of March, 1826. His early oriental

studies were made while attaché of the Persian legation. Later he became professor of Turkish at the School of Oriental Languages, besides holding the professorship of the Persian language in the College of France. Jan. 9, 1885, he acceded to the chair of Arabic languages in the same institution. He published a *Geographical, Literary and Historical Dictionary of Persia and the Adjacent Countries*, and various other oriental works; made an officer of the Legion of Honor, Dec. 31, 1884.

BARBOU, a French family of famous printers who lived in the sixteenth century. John Barbou, of Lyons, was the head of the family, and from his press came, in 1539, the handsome edition of Clement Marot's works. Hugh Barbou brought out the celebrated edition of *Cicero's Letters to Atticus*. Joseph Gaspard Barbou published a continuation of the series of Latin classics in duodecimo. In the British Museum there is a complete set of the Barbou classics.

BARBOUR, PHILIP PENDLETON, jurist, was born in Orange County, Virginia, May 25, 1783; died at Washington, District of Columbia, Feb. 24, 1841. He was famous as a criminal lawyer, and from 1821 to 1825, was speaker of the House, having been first elected to Congress in 1814. In 1836, he was appointed an associate judge of the supreme court of the United States.

BARBOURSVILLE, capital of Knox County, southeastern Kentucky, is on the Cumberland River. The Louisville and Nashville railroad passes through it, and Frankfort is 116 miles N.W. Farming, mining and lumbering are the chief industries of the county. Population 1890, 1,162.

BARBOURSVILLE (Cabell Courthouse), western West Virginia, county seat of Cabell County, is situated on the Guyandotte River and the Chesapeake and Ohio railroad. It is 41 miles W. of Charlestown. A normal school is in the town. On July 13, 1861, the Federal troops won here a decisive victory in a brief engagement with a Southern army. Population of the district in 1890, 1,838.

BARBOZA. See CALDAS BARBOZA, in these Supplements.

BARBY, walled town of Prussian Saxony, on the left bank of the Elbe, is 15 miles S.E. of Magdeburg. It is well built and has an old castle. Woolen and linen goods are the chief exports. Population, 5,600.

BARCAROLE, a species of song once peculiar to the gondoliers of Venice. The name is also applied to musical compositions for voice or pianoforte of a similar character. It is usually in $\frac{6}{8}$ time, with an alternating strong and light beat, as if following the sound of oars, though Chopin furnishes one in $\frac{12}{8}$ time.

BARCELONA, Caribbean seaport of northern Venezuela, is the capital of the state of Bermudez. It lies in lat. 10° 10′ N., lon. 64° 48′ W., and is at the mouth of the Neveri River. The city is unhealthful and poorly built. Population, 12,758.

BARD OR BARDO, a fortress and village of Piedmont, Italy, situated on the left bank of the Dora Baltea, about 23 miles S.E. of Aosta. When the French crossed the St. Bernard in 1800 the fortress of Bard offered a resistance to their farther advance into Italy. The French failed to take the fortress by storm, but they succeeded in dragging their artillery under and past the guns of the fort during the night, and were far on the road to Ivrea before the Austrian commander was aware that they had passed. Bard was taken a short time after by the French, and destroyed, but has since been restored. Population, about 600.

BARDELEBEN, KARL, anatomist, was born at Giessen, Germany, March 7, 1849. His medical degree was obtained from the University of Berlin in 1871, and two years later he was appointed professor and prosector at the University of Jena. He is the author of *Beiträge zur Anatomie der Wirbelsäule*, and *Die Gesetzmässigkeit des Knochenbaues und seine Allgemeine Bedeutung*.

BARDESANES OF EDESSA. See SYRIAC LITERATURE, Vol. XXII, p. 827.

BARDINGS OR BARD, the horse-armor used during the middle ages. It was in four pieces: one to protect the face and head, one for the neck, one for the shoulders and chest, one from the cantle of the saddle to the tail. A horse thus protected with armor was called "barded."

BARDOUX, AGÉNOR, politician, was born at Bouges, France, Jan. 15, 1829. He was elected, Feb. 8, 1871, to the assembly as the representative of Puy-de-Dôme. He added his strength to the Left Center, whose president he was chosen in 1875. He became, Dec. 14, 1877, minister of public instruction, and developed the work of this department. He was elected senator for life, Dec. 7, 1882; is a member of the Institute and of the Academy of Moral and Political Science. *Les Légistes et Leur Influence sur la Société Française; Dix Années de Vie Politique; Études d'un Autre Temps*, and other works are from his pen.

BARDSLEY, CHARLES WAREING, Episcopal clergyman and author, was born at Keighley, Yorkshire, England, in 1834. He graduated at Oxford in 1868, and was ordained vicar of Ulverston, diocese of Carlisle. He has written *English Surnames, their Sources and Significations; John Lexley's Troubles; Romance of the London Directory; Curiosities of Puritan Nomenclature;* and other works of a similar nature.

BARDSLEY, JOHN WAREING, bishop of Carlisle, was born at Keighley, Yorkshire, England, in 1835; was graduated at Dublin University, Ireland; held a vicarate in Liverpool, and in 1887 was consecrated bishop of Sodor and Man. In 1892 he was translated to Carlisle. He was archdeacon of Warrington from 1880 to 1886; has written *Counsels to Candidates for Confirmation* and *The Origin of Man*.

BARDSTOWN, capital of Nelson County, central Kentucky, and the terminus of a branch of the Louisville and Nashville railroad, is 39 miles S. of Louisville. It contains an orphan asylum, an academy, St. Joseph's Seminary and College (Catholic), and a college for young women; has flouring-mills and distilleries. Population 1890, 1,524.

BAREBONE'S PARLIAMENT, so called from one of its members, Praise-God Barbon, or Barebone. See CROMWELL, Vol. VI, p. 602; MILTON, Vol. XVI, p. 333.

BAREFOOTED FRIARS AND NUNS. Roman Catholic monks and nuns who wear sandals or go barefooted. They are not an isolated class, but belong to separate orders of strict observance.

BAREGE, a light, gauzy fabric for women's dresses, called in France Crêpe-de-Barèges. Bareges were first manufactured at Bagnères-de-Bigorre, southern France, but were named for Barège, a neighboring watering-place. They are usually a mixture of silk and worsted, an inferior kind being composed of cotton and worsted. They vary in color, and are a light fabric for summer wear.

BAREGIN, a local name given to the mucus-like masses formed by certain low algæ (*Cyanophyceæ*) in warm sulphur springs, notably at Baréges, in the Pyrenees. This abundant formation of mucilage is a product of the cell-walls, and holds imbedded together colonies of the one-celled plants which produce it. It imparts a flesh-broth flavor and odor to the water, which is prized, and is sometimes imitated by adding animal gelatin to the sulphur baths, where baregin is deficient.

BAREILLE, JEAN FRANÇOIS, L'ABBÉ, ecclesiastical writer, was born at Valentine, Haute-Garonne, France, in 1813. He was chosen honorary canon of the dioceses of Toulouse and Lyons and head of the school of Sorèze. His time was chiefly devoted to ecclesiastical writing. Among his productions are *History of St. Thomas of Aquinas; Emilia Paula;* and *Letters to a Skeptic on the Subject of Religion.*

BARENTZ, WILLEM, a Dutch navigator of the sixteenth century. He made a number of voyages toward the north pole. He discovered the islands of Spitzbergen while endeavoring to find a northeast passage to India. Barentz Sea is named after this intrepid explorer. He died near Nova Zembla, June 20, 1597, while on a voyage of exploration. Parts of his journal have recently been found by members of different expeditions to the polar regions. See GEOGRAPHY, Vol. X, p. 184; also POLAR REGIONS, Vol. XIX, p. 317.

BARFOD, PAUL FREDERIC, Danish poet and historian, was born at Lyngby, Jutland, April 7, 1811. In 1866 he became an assistant at the Royal Library of Copenhagen. His principal work is *Narratives from the History of the Fatherland.* His charming style made his writings very popular in Denmark.

BARGAIN AND SALE, a technical legal term meaning a contract or bargain for the sale of real estate. The term is not generally applied to the sale of personal property. The proper technical words to use in a contract, to create a bargain and sale, are "*bargain and sell,*" but any words which will show that such a contract is intended will be sufficient. Such a contract, under the English statute of uses,—statutes similar to which exist in most of the states of this country,—gives the purchaser or bargainee the right to the use or a beneficial ownership in the property without other legal conveyance, and the vendor is held to stand seised for the use and benefit of the purchaser. Such a contract when made in writing, as is required in all states, amounts, by operation of law, to an absolute conveyance of the title to the property, and is of general use in the United States. All things that may be conveyed by deed may also be conveyed by bargain and sale. See SALE, Vol. XXI, pp. 205–210; REAL ESTATE, Vol. XX, p. 308.

BARGA PASS, a mountain pass among the Himalayas, is in the Punjab, in the northern portion of Bashahr state, India. Its highest point is 15,000 feet above sea-level. Within a mile of it are two other and more elevated passes.

BARGE, a word that commonly denotes a double-deck passenger or freight boat, having no motive power of its own, but intended to be attached by a hawser to a towboat. Such a boat is used either for the transportation of bulky produce, such as hay and straw, or for the carrying of passengers for short distances on smooth water on pleasure excursions. A lapstreak somewhat like a shell, but better adapted to rough water, and used by racing-crews while in training, is also known in the United States as a barge. See ROWING, Vol. XXI, p. 30.

BARGE, an old town of Piedmont, northwestern Italy, in the province of Cuneo, and 28 miles S.W. of Turin, with which a railroad connects it. It has a college, manufactures of firearms, and slate-quarries are in the neighborhood. In 1808 the town suffered severely from an earthquake. Population, 10,886.

BARGE–BOARD OR VERGE–BOARD. See ARCHITECTURE, Vol. II, p. 475.

BARGUE, CHARLES, French painter, was born in Paris in 1858, and died there in 1883. His few extant pictures show remarkably minute finish and depth of color. He studied under Gérôme. His most famous work, *Playing Chess on the Terrace,* is in a private collection in New York City.

BAR HARBOR, a fashionable summer resort in Hancock County, Maine, on the northeastern side of Mount Desert Island, and on Frenchman's Bay. It is 5 miles E. of Mount Desert town, and a ferry connects it with the terminus, on the main shore, of a railway to Bangor, and this constitutes the main access to the island. Population, about 1,800.

BARIATINSKI, ALEXANDER IVANOVICH, PRINCE, field-marshal, was born in Russia in 1814; died in Geneva, March 9, 1879. He was educated in company with the future czar, Alexander II; entered the army, and became lieutenant-general in 1852. In 1856, Alexander II having ascended the throne, Bariatinski was placed in charge of the forces in the Caucasus, and after three successful campaigns he stormed Ghunib and captured Schamyl.

BARILLA OR SODA–ASH, an impure carbonate of soda. See SODIUM, Vol. XXII, p. 242.

BARING, a family of famous bankers, prominent in English diplomacy. John Baring, the head of the family, came from Bremen and settled in Exeter, England, early in the eighteenth century. The firm Baring Brothers and Company was established in London in 1770, by his sons, John and Sir Francis. SIR FRANCIS (1740–1810) was made a baronet by the younger William Pitt, in recognition of his support of the Pitt ministry. He lived in Devonshire, and was a director of the East India Company; author of *Observations on the Establishment of the Bank of England.* Of his sons, SIR THOMAS (1772–1848)

succeeded to the baronetcy. He was a liberal patron of art, and made a valuable collection of paintings.—HENRY BARING (1776–1848), brother of preceding, was put in charge of the East India Company's affairs in Canton, China. Returning to England, he became one of the lords of the treasury.—CHARLES BARING (1807–79), another brother, was made bishop of Gloucester and Bristol in 1856, and was translated to the see of Durham in 1861.—ALEXANDER BARING (1774–1848) was raised to the peerage as Baron Ashburton in 1835. (See ASHBURTON, in these Supplements.)—Sir Thomas Baring had three sons, who became prominent. FRANCIS THORNHILL (1796–1866) entered Parliament for Portsmouth in 1826, and under Sir Robert Peel was Secretary of the Treasury and Chancellor of the Exchequer. Under Lord John Russell he became Lord of the Admiralty; was made Baron Northbrook in 1866. THOMAS (1800–73) was an active member of the mercantile house of the family, and was in Parliament as the representative of Great Yarmouth and Huntingdon. He was chairman of the Lloyd's, underwriters, of London. JOHN established, in 1826, the well-known firm, Bates and Baring, which was later merged into the older banking-house.—THOMAS GEORGE BARING, eldest son of Francis Thornhill, the first Baron of Northbrook, was born in 1826. He entered Parliament in 1857 for Penryn and Falmouth, and succeeded to the peerage upon his father's death in 1866. From 1872 to 1874 he was Viceroy and Governor-General of India. Under the Gladstone administration of 1880–85 he was First Lord of the Admiralty. In 1876 he was elevated to the earldom of Northbrook.—THOMAS CHARLES BARING (1831–91) was the son of Charles, the Bishop of Durham. For some time he represented in New York City the family banking-house. For twenty years he was a member of the firm; he was one of the representatives of the city of London in Parliament; author of *Pindar in English Rhymes* and *The System of Epicurus.*

Because of the fall in value of their extensive investment in securities of the Argentine Republic, the banking-house of the Barings was compelled to go into liquidation on the 11th of November, 1890, a general crisis being averted by the Bank of England, which organized a syndicate that assumed $150,000,000 of their liabilities. This enabled the Barings to resume business.



SABINE BARING-GOULD.

BARING-GOULD, SABINE, a divine and man of letters, was born at Exeter, England, Jan. 28, 1834. His early studies were of wide range, and he accumulated a vast store of out-of-the-way knowledge, especially of matters pertaining to the middle ages. His principal works in this line are *The Book of Werewolves; Post-mediæval Preachers; Curious Myths of the Middle Ages; Curiosities of Old Times.* Of a number of novels his earliest, *Mehalah,* and his *Richard Cable* are stories of uncommon power. His range of writing is very large; as, from a semi-scientific examination of the *Origin and Development of Religious Belief* to folk-lore in *The Book of Werewolves* and *Fairy Stories,* or to critical studies of *The Lost and Hostile Gospels.* He is at his best in dealing with out-of-the-way erudition, although he developed at last much felicity as a romancer. He was the author of more than fifty volumes, among them a series of fifteen on *Lives of the Saints.* In 1871 he was appointed rector of East Mersea, Colchester, by the crown. The next year he succeeded to the family estates on his father's death, and in 1881 assumed the family living of Lew Trenchard. One of his latest books, *The Tragedy of the Cæsars,* more biographical than historical, is full of curious lore.

BARINGO, a lake of Africa, northeast of Victoria Nyanza. It lies almost under the equator; is 20 miles long and 3,000 feet above the sea. See AFRICA, Vol. I, p. 255.

BARITAH, a name applied to an Australian bird of the crow family (*Corvidæ*). One species known as the piping crow has a very pleasing voice, and is often kept as a domestic pet.

BARITONE OR BARYTONE, a male voice whose compass partakes of both bass and tenor. It is not so deep as the lowest bass nor so high as tenor. Its range is from lower G of the bass clef to lower F of the treble. In the Greek grammar, barytone words are those whose final syllable is unaccented.

BARIUM, a metal of the alkaline earths, resembling strontium. Pure barium is extremely rare; it is commonly found in the form of oxids or chlorids. It is thus used in tests for sulphuric acid and soluble sulphates. Chlorid of barium has long been employed to dissolve boiler incrustations. As a metal it is obtained in the form of a yellowish white powder. Exposed to the air, it unites with oxygen in forming oxid of barium or baryta. All the salts of barium are poisonous. See CHEMISTRY, Vol. V, pp. 525, 526.

BARK-BEETLE OR BARK-CHAFER, the common name of certain coleopterous insects of the family *Scolitidæ.* They often kill trees by boring holes in the bark in order to deposit their eggs. One species was very destructive to the pine forests of the Hartz Forest, Germany, in 1783.

BARKER, EDMOND HENRY, an English philologist, was born Dec. 22, 1788, at Hollym, in Yorkshire; died in London, March 21, 1839. He studied at Cambridge. Besides editions of several Latin classics and numerous contributions to periodicals, he was led, during his residence with the philologist Parr, to undertake a revision of Stephens's *Thesaurus Linguæ Græcæ.* This work was violently assailed by Bloomfield, against whom he wrote his *Aristarchus Anti-Bloomfieldanus.* He assisted Professor Dunbar in the compilation of the *Greek and English Lexicon,* published in 1813.

BARKER, FORDYCE, physician, and writer on medical subjects, was born at Wilton, Maine, May 2, 1818; died in New York City, May 30, 1891. He was graduated at Bowdoin College in 1837, and received his medical education in Boston and Paris, and began to practice in Norwich, Connecticut. Having settled in New York in 1850, ten years

later, he became obstetrical physician and professor of midwifery at Bellevue Hospital Medical College, New York City. He had held similar positions in the Medical School at Brunswick, Maine, and in the New York Medical College. He was president of the New York Academy of Medicine, received many foreign honors, and had a very lucrative practice. He wrote standard treatises on *Seasickness* and *Puerperal Diseases*.

BARKER, GEORGE FREDERIC, physicist, was born in Charlestown, Massachusetts, July 14, 1835. He was an assistant in chemistry at Yale and Harvard; later he was professor of chemistry and geology at Wheaton (Illinois) College, and of chemistry at the Albany Medical College. In 1864 he became professor of natural sciences at the Western University of Pennsylvania, and three years later was appointed professor of physiological chemistry and toxicology at Yale. He was elected professor of physics at the University of Pennsylvania in 1873. In 1878 he was president of the American Association for the Advancement of Science. He was a delegate to the International Congress of Electricians held in Paris in 1881, and a commissioner of the United States at the International Electrical Exhibition held at the same time, and received from the French government the decoration of the Legion of Honor, with the rank of commander. His *Textbook of Elementary Chemistry*, published in 1870, is a standard authority and is extensively used. Among his other works may be mentioned *On the Force of Nature*, and *On the Correlation of Vital and Physical Forces*.

BARKER, JACOB, financier, was born in Kennebec County, Maine, Dec. 7, 1779; died in Philadelphia, Dec. 26, 1871. During his business career he made and lost several fortunes, having early entered a commission house in New York and engaged in the shipping business and in speculations in oil. His last fortune, accumulated in New Orleans, where he had established himself in 1834, was swept away by the Civil War. During the War of 1812 he was employed by the government to negotiate a loan of five million dollars. He was one of the originators of the Tammany Society, and was elected a state senator. He was accused of fraud in connection with the failure of an insurance company, and conducted his own defense with much ability. The indictment was quashed on a new trial, though Mr. Barker had been at first found guilty.

BARKER, JOSIAH, ship-builder, was born in Marshfield, Massachusetts, Nov. 16, 1763; died in Charlestown, Massachusetts, Sept. 23, 1843. In 1810 the government made him naval constructor. He built the ships *Virginia*, *Warren*, *Cumberland* and other war-vessels.

BARKER'S MILL, a device invented by Dr. Barker, about the end of the seventeenth century, for producing continuous clock-motion. See CLOCKS, Vol. VI, p. 15.

BARKING BIRD, a bird of the genus *Hylactes*, found in Chile. Its cry is said to sound like the bark of a small dog.

BARLAAM, a bishop who lived in the fourteenth century. He pursued his studies at Thessalonica and then went to Constantinople, where he changed from the Roman Catholic to the Greek religion. He was made abbot of St. Salvador, but on his return to Italy he rejoined the Roman Catholic Church and was given the bishopric of Gierace in the kingdom of Naples. Petrarch tried without success to learn Greek from him. He was a commissioner from the Byzantine court for the promotion of the union of the Greek and Latin churches to Pope Benedict XII. See HESYCHASTS, Vol. XI, p. 782.

BARLEYCORN, JOHN, a personification of barley as the source of malt liquor or whisky. There exists a whimsical English tract of old date, under the title of *The Arraigning and Indicting of Sir John Barleycorn, Knt., Printed for Timothy Tosspot*, in which Sir John is described as of "noble blood," well beloved in England, and a maintainer of both the rich and the poor. Robert Burns's humorous poem, *John Barleycorn*, gave the name renewed currency.

BARLEY, a very widely distributed and valuable cereal belonging to the family *Gramineæ*. It was an important food even in the times of the early Hebrews and Greeks.

The common barley of the United States is *Hordeum vulgare*. Barley occupies a prominent place in the rotation of the lighter class of arable lands. It will grow on a lighter soil than is needed for the successful production of wheat, but good drainage is indispensable. It comes to the greatest perfection on mellow, rich loam. Barley must be sown early in the spring, and flourishes on good clover or grass land, turned down the preceding fall. The allowance of seed ranges from two to three bushels to the acre, and good judges prefer the minimum allowance. Careful preparation of the soil is necessary, and the seeding should be followed by harrowing and rolling. It is not desirable to apply fresh manure direct to this crop. Unless great care is exercised in the selection of clean seed, barley is apt to be infested by weeds, and will require the close attention of the farmer during the whole period of its growth. The plant, when it grows luxuriantly, is very apt to become laid by rain and to shell and waste in the field.

Barley is most productive where the climate is moderately dry and warm. Fine malting-barley has a ready demand in the market. See also Vol. III, p. 376; and AGRICULTURE, in these Supplements.

BARLOW, FRANCIS CHANNING, soldier and lawyer, was born in Brooklyn, New York, Oct. 19, 1834. In the Civil War he left his law practice and editorial work on the New York *Tribune* to enter the army. He fought at Fair Oaks, Antietam, Chancellorsville, Gettysburg, Spottsylvania and Petersburg, distinguishing himself for bravery and receiving the rank of brigadier-general. After the war he was secretary of state of New York (1865–68); appointed by President Grant United States marshal for the southern district of the state; in 1872–76 was attorney-general of the state; practiced law in New York City after 1872.

BARLOW, JANE, an Irish authoress, is the daughter of Professor Barlow of Trinity College, Dublin. Her first work, *Walled Out*, appeared in the *Dublin University Magazine*, anonymously, in 1885, but her

*Irish Idylls*, published in October, 1892, brought her immediate recognition. Her *Bogland Studies; Kerrigan's Quality; The Mockers of the Shallow Waters; The End of Elfin Town; Maureen's Fairing* (1895); and *Mrs. Martin's Company* (1896), have been scarcely less successful. Critics have said that she has done for the peasantry of Ireland what J. M. Barrie has done for those of Scotland. Her brogue is well rendered, and her characters are free from the Irish whine of grievances.

BARLOW, JOEL, author and diplomatist, was born at Redding, Connecticut, March 24, 1754; died near Cracow, in Poland, Dec. 24, 1812. After graduating from Yale he spent some time in the army as chaplain. He then took up law and started the paper *American Mercury*. He edited the *Book of Psalmody*, wrote the famous *Vision of Columbus*, afterward incorporated into heroic and bombastic verse, called *The Columbiad*, and a popular mock-heroic poem entitled *Hasty Pudding*. He resided in London for two years, where he wrote *Advice to the Privileged Orders*. He lived for some time in France, and was sent by the United States on important missions to Algiers and to France, on the last of which he died while attempting to reach Napoleon, then retreating from Russia. *Life and Letters of Joel Barlow* has been written by Charles Burr Todd of New York.

BARLOW, SAMUEL LATHAM MITCHELL, lawyer, was born at Granville, Massachusetts, June 5, 1826; died at Glen Cove, Long Island, July 10, 1889. His father was a physician, Samuel Bancroft Barlow, who married a descendant of Captain Joe Wadsworth of Charter Oak fame. He gained his widest fame through his connection with the lawsuit which expelled Jay Gould from the control of the Erie railway after the death of James Fisk, Jr. The English and other ill used stockholders of the railroad had long been looking for an opportunity to oust the manipulators into whose hands the property had fallen. Fisk had been a hard fighter, and lavished the money he had made in keeping the Erie in his power. He and Gould employed distinguished counsel, who kept the two impregnably intrenched. After Fisk was shot a suit was begun against Gould for $10,000,000. He retained able counsel to defend him, but after several weeks of consultation and negotiation he was advised to compromise, which he did, paying $9,000,000 in full settlement. Mr. Barlow was elected one of the directors of the road under the new management, and was retained as its private counsel. He was noted for the magnitude of the retainers paid to him. Though not an office-holder, he was a noted adviser of the Democratic party.

BARLOW, WILLIAM HENRY, civil engineer, was born at Woolwich, England, in 1812. He was educated as an engineer at Woolwich, and in 1832 was sent to Constantinople, where he built the establishment for the reconstruction of the Turkish ordnance, and rendered various other services. He returned to England in 1833. Among the many engineering enterprises with which he has been connected are the Tay, the Clifton and the Firth of Forth bridges. In 1857 he became consulting engineer of the Midland Railway Company, the laying of many of whose lines he had already superintended. He was instrumental in securing the introduction of Bessemer steel into structural use. He wrote *Diurnal Variation of Electric Currents on the Surface of the Earth*, and several papers on kindred subjects.

BARMECIDE'S FEAST, an "Arabian Nights'" tale. See BARMECIDES, Vol. III, p. 377.

BARMOUTH, a picturesque watering-place of Wales, at the mouth of the Mawddach River, Merionethshire. On the opposite side of the river is the mountain Cader Idris. Population, 2,045.

BARNABY, SIR NATHANIEL, an English naval engineer, was born in Chatham in 1829, of a family long engaged in ship-building; became a shipwright; educated at Portsmouth School of Naval Architecture; entered the Admiralty designing office in 1855; rose to be Chief Naval Architect to the British navy in 1872; soon after Director of Naval Construction; introduced steel construction of ships; designer of nearly all the important vessels of the modern navy of the United Kingdom; knighted in 1885; contributed articles on NAVY (see Vol. XVII, pp. 279–300), and SHIP-BUILDING (see Vol. XXI, pp. 809–825) to this ENCYCLOPÆDIA.

BARNACLE, the common name applied to the cirripeds, a group of degenerated crustaceans. Those of the family *Lepadidæ* are often called goose-barnacles, from the old myth that they eventually turned into geese. The members of the family *Balanidæ* are commonly called rock-barnacles, or acorn shells. See CRUSTACEA, Vol. VI, pp. 664, 665.

BARNACLE GOOSE. See BRENT GOOSE, in these Supplements.

BARNARD, LADY ANNE, eldest daughter of James Lindsay, fifth earl of Balcarres, was born in Scotland in 1750; died in London, May 6, 1825. She married Andrew Barnard, colonial secretary to Lord Macartney at the Cape of Good Hope, who died in 1807. She was the author of *Auld Robin Gray*, in 1772, but did not acknowledge its authorship till 1823.

BARNARD, CHARLES, author, was born in Boston, Massachusetts, Feb. 13, 1838. He was successively a clerk, a theological student, a florist and a journalist. He was editor of *Vox Humana*, and assistant editor of the Boston *Journal of Commerce Boston Post*, and editor of *World's Work Department* in the *Century*. He wrote many short stories, and among his published books are *My Ten-Rod Farm; The Soprano;* and *Knights of To-day*. He was also the author of operas and dramas.

BARNARD, EDWARD EMERSON, astronomer, was born in Nashville, Tennessee, Dec. 16, 1857. He early learned photography, and was enabled to pursue his astronomical studies by his profits as a photographer. In 1883 he became fellow in astronomy at Vanderbilt University, and, after his connection ceased there in 1887, became an astronomer at the Lick Observatory in California. In 1894 he was called to take charge of the Lowe Observatory near Pasadena, California, and in the succeeding year he went to Lake Geneva, Wisconsin, where is located the Yerkes Observatory of the University of Chicago, whose astronomer he had been elected. He is best

known for his discovery, on Sept. 9, 1892, of the fifth satellite of Jupiter. He was very successful in the discovery of comets.

BARNARD, FREDERICK AUGUSTUS PORTER, educator; born in Sheffield, Massachusetts, May 5, 1809; died in New York City, April 27, 1889. He was educated at Yale, and taught there, afterwards going as instructor to the Hartford Asylum for the Deaf and Dumb, and later to a similar institution in New York. From 1837 to 1854 he occupied the chairs of mathematics, natural philosophy, and chemistry in the University of Alabama. In 1854 he took orders in the Episcopal Church, and taught mathematics and astronomy in the University of Mississippi, of which institution he became the president in 1856, serving till 1861. Upon the outbreak of the Civil War he resigned his position and came North. In 1864 he was called to the presidency of Columbia College, and this position he held for the remainder of his life. He was sent as United States commissioner to the Universal Exposition in Paris in 1867. In 1878 he went as assistant commissioner-general to the exposition held in the same city. He was a member of the Labrador expedition sent out in 1860 to observe the sun's eclipse. Several colleges conferred honorary doctorates upon him. He was president of the American Association for the Advancement of Science, and of the American Institute. He wrote many reports, essays and books. His principal works are *Treatise on Arithmetic; Analytic Grammar, with Symbolic Illustration* (for use in schools for the deaf and dumb); *Letters on Collegiate Government; History of the United States Coast Survey; University Education; Undulatory Theory of Light;* and *The Metric System.* He was one of the original corporators of the National Academy of Sciences. His best work was done at Columbia College, whose usefulness and strength he greatly increased. He was an advocate of opening colleges for men on equal terms to women, but failed to carry his point with the trustees of Columbia College. His estate was devised to the college over which he presided at his death. In his honor Barnard College for Women was founded as an annex to Columbia University, and in 1896 it received $160,000 to provide itself with a new building on Washington Heights.



PROFESSOR BARNARD.

BARNARD, HENRY, was born at Hartford, Connecticut, Jan. 4, 1811. He graduated at Yale, and in 1837 was elected to the legislature of Connecticut. Here he was active in instituting prison and asylum reforms. He organized high schools, teachers' institutes, a normal academy, and reorganized the public school system. He was secretary of the board of school commissioners in Connecticut, school commissioner of Rhode Island, president of the University of Wisconsin (1856–59), and later of St. John's College at Annapolis. He was a voluminous writer on educational subjects, and in 1886 made a collection of his publications, which comprised 52 volumes. From 1867 to 1870 he held the important office of United States commissioner of education. Among his writings are *Normal Schools in the United States and Europe; Education in Factories; School Libraries;* and *Hints and Methods for the Use of Teachers.* In 1851 he established the *American Journal of Education.* His reports are voluminous, cover a vast range of educational topics, and are of high authority.

BARNARD, JOHN GROSS, engineer, brother of Frederick A. P. Barnard, was born in Sheffield, Massachusetts, May 19, 1815; died in Detroit, May 14, 1882. He was graduated at West Point in 1833; engaged in engineering on the Gulf Coast and at the Pensacola and the New Orleans fortifications. After the Mexican War, in which he served, he was sent to survey the Isthmus of Tehuantepec in the interest of the proposed railroad from ocean to ocean. In 1855 he was superintendent of the West Point Military Academy. During the war he was chief engineer of the Union army in Virginia from the earliest fortification of Washington to the close of the siege of Petersburg, and wrote valuable reports of its engineering operations. He was finally breveted major-general "for gallant and meritorious services in the field." He wrote *Survey of the Isthmus of Tehuantepec; Dangers and Defenses of New York; Eulogy of General Totten; Notes on Sea-Coast Defense; Problems of Rotary Motion Presented by the Gyroscope;* and other works.

BARNARDO, THOMAS JOSEPH, an English philanthropist, the pioneer of a social movement, who has been felicitously termed "The Father of the Don't-live-nowheres," was born in Ireland, of an Hispano-German father and an English mother. With intense religious convictions, he came to London as a youth for medical as well as theological training. In the cholera epidemic of 1866 he did yeoman service amidst the indescribable squalor of the East End poor, laboring in his spare moments for a ragged school in the teeming depths of Stepney. Here he saw the starvation and untold misery of the homeless Bedouin boys of London, "the Don't-live-nowheres," and under the ægis of Lord Shaftesbury set out to reclaim them from otherwise criminal careers. Commencing in 1866 with 25 boys, at the present time his homes find continuous permanent shelter for over 5,000 destitute children. In 29 years of his operations 28,491 children have been rescued, trained and placed out, over 12,600 passing through his hands in 1895. So widespread has the influence of the Barnardo homes been that no less than 85 branches exist in London and the principal cities of England, and for the most promising boy-graduates of his system an extensive demand has sprung up in Canada, where three homes are maintained. His Girls' Village Home at Ilford, Essex, has done as noble a work for the weaker sex, the rank and file whence the vast army of the metropolitan scarlet women would otherwise have been recruited. A strictly industrial training is imparted to all inmates, 8,000 of whom have been

placed in colonial situations, 98 per cent of them turning out well in the world.

BARNATO, "BARNEY," speculator in South African mining stocks; born in Whitechapel, London, in 1852, of respectable Jewish parents, whose real name was Isaacs. After a career as circus clown and actor in South Africa, he attracted notice as a shrewd speculator, and rose to fame and fortune upon the development of the Kimberley diamond mines. He came into rivalry with Cecil Rhodes, but their companies were united, and in 1888 chose Mr. Barnato as life governor. His wealth received an addition from new operations in gold-mining stocks in the Rand. He committed suicide June 14, 1897, by jumping overboard while on a voyage from Cape Town to England.

BARNBURNERS, a nickname for one faction of the Democratic party of New York after the election of Polk to the Presidency in 1844. The Barnburners were adherents of Martin Van Buren, and opposed the further extension of slavery into the territories. In the elections of 1848, they coalesced with the Free Soil party that nominated Van Buren for the Presidency, thus dividing the Democratic party in New York, and giving the majority of the electoral college to the Whig candidate, General Taylor.

BARNBY, SIR JOSEPH, an English composer, especially of sacred music, was born Aug. 12, 1838, in York; choir boy at the Cathedral there; studied at the Royal Academy of Music; from 1863 to 1871 organist of St. Andrews Church, London; precentor and director of music at Eton College, 1875; organist of St. Anne's, Soho, where he instituted annual performances of Bach's Passion music; a founder and the first director of the London Musical Society, 1878; conductor at the Royal Academy of Music, 1886; principal of the Guildhall School of Music, 1892; knighted the same year; composed music for the anthems *King all Glorious* (1868), and *The Lord is King* (1883); the oratorio *Rebekah* (1870); edited a *Hymnary* for Novello to which he contributed freely; author of many anthems, hymn-tunes, chants, part songs, etc., of great beauty for melody and harmony, and widely introduced into public worship; instituted the annual performances in England of Bach's *Passion*, and conducted many choirs on occasions of state; died Jan. 28, 1896, in London.

BARNEGAT BAY, a body of water 23 miles long, in Ocean County, New Jersey, is connected with the Atlantic by an inlet one mile wide, and separated from the ocean by the narrow, sandy beaches and dunes called Squan Beach and Island Beach. A lighthouse, 150 feet high, stands on the south side of the inlet. The bay is a submerged marsh intersected by channels of deeper water, locally known as "thoroughfares."

BARNES, CHARLES REID, botanist, was born at Madison, Indiana, Sept. 7, 1858. After graduation from Hanover College, he was an assistant in the herbarium at Harvard University; was professor of botany at Purdue University (1879–87), and has occupied the same chair at the University of Wisconsin since 1887. He is the author of *Keys to Genera and Species of North American Mosses*, and one of the editors of the *Handbook of Plant-Dissection* and the *Botanical Gazette;* is an authority on the mosses of North America.

BARNES, DANIEL HENRY, Baptist minister and classical scholar, was born at Canaan, New York, April 25, 1785; died near Troy, New York, Oct. 27, 1828. He was a graduate of Union College, and after ordination took charge of a classical school at Schenectady, New York. President Francis Wayland Bishop Alonzo Potter and Dr. Erskine Mason were among his pupils. Later he became professor of languages in the Baptist Theological Seminary in New York City, and afterward started a successful English and classical school there. He assisted Dr. Webster in the compilation of his Dictionary, and was a writer on geology.

BARNES, WILLIAM, clergyman, philologist, and perhaps the first of purely pastoral English poets, was born in Dorsetshire in 1800; died at Winterborne Came, where he was the rector, Oct. 7, 1886. His poetical world was the secluded vale of Blackmore. Its humble inhabitants, with all their quaintness and humor, are photographed with charming artistic truth in his poems. His collected poems were published in 1879 as *Poems of Rural Life, in the Dorset Dialect.* Among his philological works is an attempt to teach English in purely English words, which has been characterized, from the use of such words as "time-takings" for tenses, "mark-words of suchness" for adjectives, as making large demands on the reader's patience. His *Life*, written by his daughter, appeared in 1887. See DORSET, Vol. VII, p. 372.

BARNESVILLE, a village of Pike County, central Georgia, is 60 miles by rail S. of Atlanta. It is the seat of the Gordon Institute, and contains an excellent high school. Buggies are built here, and there is a large cotton factory. Population 1890, 1,839.

BARNESVILLE, a manufacturing town of Belmont County, east-central Ohio, is 32 miles by rail W. of Wheeling. It is the center of an extensive agricultural district, noted especially for its strawberries; is the seat of Olney College. Population 1890, 3,207.

BARNETT, JOHN, musician and composer, was born near Bedford, England, July 15, 1802; died at Cheltenham, April 17, 1890. He was taken to London in 1812, and, having a rich contralto voice, sang in many operas at the Drury Lane Theatre. He wrote more than two thousand songs, and besides other operas, *The Mountain Sylph; Fair Rosamond;* and *Farenilli.*—His nephew, JOHN FRANCIS BARNETT, born 1837, composed *The Ancient Mariner*, a cantata; *Paradise and the Peri; The Raising of Lazarus; The Lay of the Last Minstrel*, and *The Good Shepherd*,—mostly written for musical festivals,—and a large number of minor pieces. He is a teacher of the piano at the Royal Academy of Music, London.

BARNETT, SAMUEL AUGUSTUS, English philanthropist, was born in 1844; was graduated from Wadham College, Oxford, and in 1872 was appointed vicar of St. Jude's, Whitechapel. In 1893 he became canon of Bristol. He and his wife have been identified with almost all efforts to elevate and educate

the people of East London. He founded "Toynbee Hall," a university settlement in Whitechapel, and established there free exhibitions of pictures.

BARNEY, JOSHUA, naval officer, was born in Baltimore, Maryland, July 6, 1759; died at Pittsburg, Pennsylvania, Dec. 1, 1818. For bravery shown in action he was made lieutenant on the schooner *Wasp*. He was three times taken prisoner by the English, but exchanged. After having captured the *Charming Mollie*, he was twice taken a prisoner, but escaped, and was given a ship, and sent to clear the Delaware of British privateers. He captured the *General Monk*, an 18-gun ship, and for this was voted a sword by the Pennsylvania legislature. During the War of 1812 he was assigned to the defense of Washington, and at the battle of Bladensburg was made prisoner by the English for the seventh time. In 1815 he was sent on a mission to Europe, but ill health compelled his return. In 1817 President Monroe appointed him naval officer of the port of Baltimore.



JOSHUA BARNEY.

BARNFIELD, RICHARD, poet, was born at Norbury, England, 1574; died at Stone, Staffordshire, 1627. He was educated at Brasenose College, Oxford. His verse is quaint, but over-luxuriant. The ode, *As it Fell upon a Day*, and the sonnet *If Musique and Sweet Poetrie Agree*, were for a long time attributed to Shakespeare. See also PASTORAL, Vol. XVIII, p. 347.

BARN-OWL, a name applied to the small white owls of the family *Aluconidæ*. The American species (*Strix pratincola*) is abundant in the Southwestern states. See OWL, Vol. XVIII, pp. 88–91.

BARNSTABLE, a port of entry and capital of Barnstable County, southeastern Massachusetts; is on Barnstable Bay and 72 miles by rail S.E. of Boston. The township contains a number of summer resorts. Cranberry-culture and fishing are the chief industries. Population of township in 1895, 4,055.

BARNUM, PHINEAS TAYLOR, showman, was born at Bethel, Connecticut, July 5, 1810; died April 7, 1891, at Bridgeport, Connecticut. In his youth he was a clerk in a country store, and then agent for a lottery company. In 1829 he started the unsuccessful newspaper, *Herald of Freedom*. He came across Joyce Heth, a colored woman, the reputed nurse of General Washington, and said to be 160 years old. He bought her, and by his shrewdness earned considerable money as a showman. Within a year the woman died, and Mr. Barnum traveled South with small shows, wrote for newspapers, sold Bibles, exhibited negro dancers, and finally purchased Scudder's American Museum in New York. Here he exhibited a woolly horse, a white negress, a Japanese mermaid, and the dwarf Charles S. Stratton (the famous General Tom Thumb). His greatest venture was made in his management of Jenny Lind; he offered her $1,000 a night to sing for 150 nights, and from her concerts netted $350,000. The first choice of seat for her first night was sold for $650. A clock manufacturing company which came to Bridgeport through his influence failed and involved him financially, but he paid his creditors, and built up another fortune by exhibiting General Tom Thumb in England and by delivering lectures. Mr. Barnum twice suffered loss by having his museum burned. He established a traveling menagerie and museum, which he called "The Greatest Show on Earth." The elephant "Jumbo" was one of his greatest "cards." Mr. Barnum was four times a member of the Connecticut state legislature; became the mayor of Bridgeport; delivered numerous lectures on temperance and practical affairs; wrote his autobiography, an interesting and amusing account of his struggles and artifices, and gave liberally to benevolent objects, one of his gifts being a museum building for Tufts College, near Boston.



PHINEAS T. BARNUM.

BARNUM, WILLIAM H., politician, was born in Connecticut, Sept. 17, 1818; died in Lime Rock, Connecticut, April 30, 1889. He was elected to the Connecticut legislature in 1852, and was in Congress from 1866 until 1876, when he was elected to the United States Senate for the term ending March 4, 1879. At his death he was chairman of the Democratic national committee.

BARNWELL, ROBERT WOODWARD, public man and educationist, was born at Beaufort, South Carolina, Aug. 10, 1801; died at Columbia, South Carolina, Nov. 25, 1882. He graduated at Harvard in 1821, practiced law, and was a member of Congress from South Carolina from 1829 to 1833. In 1850 he was elected to the Senate of the United States, and served until 1861, when he became a member of the Confederate congress, and from 1835 to 1841, and after the war until 1873, was president of the University of South Carolina.

BAROACH, a district and city of India. Same as BROACH, Vol. IV, pp. 356, 357.

BAROMETRIC LIGHT, the luminous appearance which is seen when the mercury of a barometer is shaken or moved through a space of a few inches. The Torricellian vacuum becomes light because of the frictional electricity generated by the mercury against the glass. The experiment is most successful when performed in the dark and in frosty weather.

BAROMETZ OR TARTARIAN OR SCYTHIAN LAMB, the prostrate stem (rhizome) of the fern *Dicksonia barometz*, which grows on the salt plains near the Caspian Sea. It is shaggy, with a silky down, and when inverted and properly trimmed has a sort of general resemblance to a small lamb. In the days of ignorant credulity, when the story of the phœnix was received as a truth of natural history, and barnacles were believed to grow into geese, and horse's hairs into eels, marvelous tales

were told of the barometz, which was supposed to partake of the nature of a plant and of an animal; to grow on a stalk and eat grass like a lamb.

BARON (ORIGINALLY BOYRON), MICHAEL, French actor, was born at Paris, Oct. 3, 1653; died Dec. 3, 1729. His father was a leather merchant and his mother a beautiful actress. Molière early became his friend and instructor. Baron was very handsome, and became famous as a writer of plays and as an actor; was called "the honor and marvel of the French stage," and was as able in tragedy as in comedy. His best production was a comedy entitled *L'Homme à Bonnes Fortunes.*

BARON, PIERRE, religious zealot, known as Peter Baro, was born at Étampes, France, December, 1534, and died in London, April, 1599. On account of his Protestantism he had to leave France for England. Here he was appointed to the chair of divinity in Cambridge. Opposed to Calvinism, and very outspoken as to his views, he met with great opposition, and was accused of heresy and a desire to lead the church back to Rome. His most offensive act was his preaching against the Lambeth Articles, drawn up to oppose him and his party. He was at last obliged to resign his office, and spent the latter part of his life in retirement. He wrote a number of treatises in Latin upon matters of religion. These have been translated into English.

BAROT, FRANÇOIS ODYSSE, a French radical journalist and man of letters, was born at Mirabeau, department of Vienne, in 1830. He early entered journalism as a profession, and was connected with *La Reforme*, *La Presse* and *La Liberté*, successively; was secretary to G. Flourens. He became the editor and owner of *La Liberté*, whose statements concerning the causes of the Franco-Mexican War of 1863–67 led to a duel in Belgium between Barot and the banker Jecker. The former was seriously wounded, and both the principals were imprisoned and fined. Statements made in *Le Fédéraliste*, during the time of the Commune, caused Barot's flight to England. After his return to Paris in 1874 he became prominent through the political press, and associated himself with E. Girardin, of whom he wrote a *Life.* Among his numerous writings are *Letters Upon the Philosophy of History; History of the Ideas of the Nineteenth Century; History of Contemporaneous Literature in England;* a series of novels, and a translation of Carlyle's *French Revolution.*

BAROTSE, a valley of eastern Africa. See ZAMBESI, Vol. XXIV, p. 766.

BAROZZI, GIACOMO DA, an Italian architect, sometimes called Vignola. See BAROCCHIO, Vol. III, p. 380.

BARR, ROBERT, a journalist and novelist; born in Glasgow, Scotland, about 1853; was taken in childhood to Canada; trained up to be a carpenter; joined the staff of the Detroit *Free Press*, where, under the pen-name of "Luke Sharp," he became known for his humorous work; in 1881 was sent to London to edit an English edition of the *Free Press;* with J. K. Jerome founded the *Idler*, and made that magazine a success; wrote *In the Midst of Alarms*, a story characteristically American in its scenes and characters, and which was rapidly circulated.

BARR, AMELIA EDITH, novelist, was born at Ulverton, Lancashire, England, March 29, 1831. Her father was the Rev. William Huddleston. She was educated at Glasgow, and in 1850 married Robert Barr. In 1853 the family came to the United States and resided in Austin, Texas, and later in Galveston. In 1869, after the death of her husband and three sons, she brought her three daughters to New York, where she became a governess, but after two years she began to write newspaper sketches, which were well received. Her first book, *Romance and Reality*, was followed by *Scottish Sketches; Jan Vedder's Wife; A Daughter of Fife; A Bow of Orange Ribbon; Rose of a Hundred Leaves; Friend Olivia; Beads of Tasmer; The Flower of Gala Water*, and other novels. Her romances are of a historical nature, and she has handled themes of Scotch, north of England and New Netherland interest with antiquarian quaintness and genial felicity.



AMELIA E. BARR.

BARR OR BARRA, a small kingdom of Mandingo, in northwestern Africa. It lies about the mouth and along the lower valley of the River Gambia; has 54 miles of coast-line, is 45 miles broad and about 200 long. Populous villages are scattered throughout the kingdom. The land is somewhat marshy, but fertile and well cultivated.

BARRACUDA, a large fish of the genus *Sphyræna*, belonging to the perch family. It is a valuable food-fish, found in warm seas.

BARRANDE, JOAQUIM, palæontologist, was born at Sauges, Haute-Loire, France, Aug. 11, 1799, and died near Vienna, Oct. 5, 1883. *Système Silurien du Centre de la Bohême* is his most considerable work. It is an authoritative and monumental work on palæozoic fossils. See GEOLOGY, Vol. X, pp. 323–339.

BARRANQUILLA, the chief port of the United States of Colombia, is situated on the Magdalena River, 15 miles from where it enters the Caribbean Sea. A bar at the river's mouth, which formerly hindered the entrance of ocean steamers into the port of Barranquilla, has been partially removed. The inland trade is very extensive, and largely controlled by Germans. It is connected by rail with the port of Sabanilla, which is 10 miles N.W. of it. Brandies, soaps, bricks and tiles are manufactured here. Population, 18,000.

BARRANTÉS Y MORENO, VINCENTE, author, was born at Badajoz, Spain, March 24, 1829. He wrote dramatic pieces, political satires, ballads and stories. He is also the author of a historical work on the Philippine Islands. He became a member of the Spanish Academy in 1872. Among his works are *Juan de Padilla; La Joven España*, and *Narraciones Extremeñas. Píldoras* is a collection of political satires, for which he was heavily fined.

BARRATRY OR BARRETRY, the offense of in-

citing and stirring up litigious or quarrelsome conduct. It is a common-law misdemeanor, but one act of this kind is not sufficient to maintain an indictment for the offense. It must be shown that the party accused frequently, or at least on more than one occasion, conducted himself in the way imputed. Therefore the principle of the law appears to strike at the habit or disposition of evil-minded persons who would incite to quarreling, or busybodies, as they are in fact called in the old law reports. Some writers use the form *barretry* exclusively for the offense described, but *barratry* in the following senses. In the law of Scotland barratry is defined as the crime committed by a judge who barters justice for money. There is also barratry of mariners. See INSURANCE, Vol. XIII. p. 186.

BARRE, a manufacturing village of Worcester County, central Massachusetts. It has an institu tion for feeble-minded children. The township is intersected by the Ware River, and has a station on the Ware River railroad. Cotton and woolen goods and straw hats are the chief productions. Population 1895, 2,278.

BARRE, a town of Washington County, central Vermont, is 6 miles by rail S.E. of Montpelier. It is the seat of Goddard Seminary. In the vicinity are granite-quarries and manufactures of agricultural tools and woolen goods. Population 1890, 4,146.

BARRE, ANTOINE LE FÈVRE DE LA, a French naval officer, born about 1625; died in Paris, May 4, 1688; was governor of Guiana in 1663; captured Cayenne from the Dutch in 1667; lieutenant-general in West Indian waters to oppose the British; governor of New France for three years from 1682; wrote descriptions of French Guiana and of Cayenne.

BARRE, JEAN AUGUSTE, French sculptor, was born in Paris, Sept. 25, 1811. He was a pupil under his father and Cortot; exhibited at the Salon of 1874, *Berryer*, a bronze statue for the city of Marseilles. His first exhibition at the Salon of 1831 attracted much favorable notice. Among his best achievements are *The Emperor; The Empress; Bacchea, Daughter of Bacchus; Prince Napoleon;* and a *Head of Apollo.* He enjoyed court patronage and executed medallion, statuette and bust portraits of imperial personages, and of celebrities in the world of politics and art. Member of the Legion of Honor in 1852.

BARRED-OWL (*Syrnium nebulosum*), a North American bird of the owl family (*Strigidæ*). It is a large bird, measuring 15 to 18 inches in length. It usually nests in hollow trees. The bird is common in the Eastern and Gulf states.

BARREL, a large cylindrical vessel primarily used for holding liquids. In the United States a barrel may denote a certain weight. Thus a barrel of flour is understood to be 196 pounds; beef, pork, fish or salt, 200 pounds. A barrel is supposed to contain 31½ gallons (wet measure), and, generally, 3¼ bushels (dry measure).

BARREL-MAKING. Barrels are principally made of oak, and Michigan is the chief source of supply of timber for them in the United States. The staves are commonly made, jointed and seasoned in the region where the wood grows, and then shipped in bulk to the factories. The first operation in manufacture is to fit the necessary staves in a wrought-iron ring so that it will encircle the lower ends. Being crowded so that they will bear handling, the circle of staves is then placed in a large cylinder and steamed, to soften the wood. A wire rope is next wound about the staves by a machine, to draw them to the proper form, and a second stout hoop is slipped on. The curvature of the staves is next rendered permanent by burning a little oil, or the like, in the interior, the operation being termed firing. A set of very stout temporary hoops are then crowded on by a set of claw-hooks operated by power. The barrel then goes to a lathe, where the roughly formed ends are turned to accurate shape, and the grooves cut for the heads. The temporary hoops are then removed and the permanent ones substituted.

In the case of barrels for oil or other fluids an internal coating of glue is applied, being poured in hot, while the barrels are rotated to spread it properly. A little steam is let into the barrel to see if it leaks, and if it does not, it is ready for the painter.

Steel barrels are made of the same sizes and shapes as the wooden barrels. The Barraclough and Heaton barrel has a body made from a rectangular sheet of steel, with a longitudinal joint welded by electricity. Stamped steel is used for the ends, which are fitted to the body between inner and outer hoops. The Caird barrel is stamped cold out of the sheet-steel, and has no longitudinal seams. The edges are spun together in a lathe and locked by lapping. The larger sizes have three joints, forming a T rib which tends to strengthen the structure. The bung and vent holes are commonly stamped so as to turn the edges in, leaving a neck to hold the bung or shive, or a surface in which a screw-thread may be cut.

A steel barrel of French manufacture is formed in two sections that are formed from flat steel plates in a hydraulic press. The edges are flanged and joined by heavy pressure. Steel barrels as a rule weigh a trifle more than wooden barrels of the same capacity.

BARREL-ORGAN, a mechanism for playing tunes by the use of a crank. A wooden cylinder or barrel is turned true and faced at one end with a notched circle, the teeth of which engage with a spiral worm turned by a crank, thus imparting a slow rotary motion to the barrel. On the outer surface of the barrel pins are inserted at certain intervals, and as they revolve, by a tripping device they open, in proper sequence, valves to musical pipes arranged in scales, thus admitting wind to them and causing them to sound their notes. The wind is supplied by a bellows operated by the crank that turns the barrel. When a tune is finished, a blade drops into a notched pin on the barrel and arrests its rotation; then the barrel may be shifted on its axis and a new set of pins brought to engage with the valves. Thus a barrel-organ may be constructed to play from one to a score or more of melodies or harmonies. The simplest mechanism of the kind is a "bird-organ," used to teach some simple melody to a singing-bird. These organs have been constructed to play psalm tunes in churches and chapels. In 1815 one was

publicly exhibited that cost $50,000, and had 1,900 pipes, with 45 stops. It produced orchestral effects. The oldest device of this nature on record was a church barrel-organ in Fulham, that dates well back in the eighteenth century. Street-organs are of this construction, and began to appear early in the nineteenth century.

BARRETT, BENJAMIN FISK, Swedenborgian minister, was born at Dresden, Maine, June 24, 1808. In 1832 he graduated at Bowdoin College, and six years later at the Cambridge Divinity School, where he became a convert to the doctrines of Swedenborg. He preached in New York City and Cincinnati till 1850, when, his health failing, he gave up pulpit-work and engaged in mercantile business in Chicago. Four years later he was made pastor of the New Church Society in Philadelphia. He wrote many books on the doctrines of the New Church, including *Doctrines of the New Jerusalem Church; On Future Life; New View of Hell; Life of Swedenborg*. He edited the *Swedenborg Library* (12 vols., 1876). He died in Germantown, Pennsylvania, Aug. 6, 1892.

BARRETT, LAWRENCE, actor, was born in Paterson, New Jersey, April 4, 1838. He made his *début* at Detroit, Michigan, in 1853, in the insignificant *rôle* of Murad, in the drama, *The French Spy*. After playing a number of small parts he became connected with the stock company of the Grand Opera House in Pittsburg, Pennsylvania, where he took leading *rôles*. This was followed by stock engagements in St. Louis, Chicago, and other cities. In 1856 he appeared at Burton's Theater, in New York City, as Sir Thomas Clifford, in *The Hunchback*. In 1858 he went to Boston and played at the Boston Museum and Howard Athenæum. In 1861 Mr. Barrett served as a captain of Massachusetts infantry. Retiring from the army, he appeared on the stage in Washington, Philadelphia, New York City and New Orleans, where he became associate manager of the Varieties Theater, and assumed leading parts in Shakespeare's plays. In 1867 he was a star actor in San Francisco. Returning to New York in 1870, he played with Mr. Booth in alternate parts at Booth's Theater, and thereafter his work chiefly lay in starring through the principal cities and acting with Booth. He was at his best in the leading *rôles* of *Julius Cæsar*, *King Lear*, *Yorick's Love*, and Boker's *Francesca da Rimini*. Mr. Barrett visited Europe several times. He was the author of a *Life of Edwin Forrest*. He died in New York City, March 20, 1891.

BARRETT, WILSON, actor, was born in Essex, England, Feb. 18, 1846; went on the stage in 1864; made his London *début* in 1876 in *Jane Shore*, and later, at the Princess Theatre, produced *The Lights o' London*, *The Silver King* and other plays, with marked success. He has made several American tours, appearing in *Othello*, *Hamlet*, *Claudian*, and in 1895 in his dramatization of Hall Caine's novel, *The Manxman*.

BARRIAS, FELIX JOSEPH, French historical painter, was born in Paris, Sept. 13, 1822. He studied under Léon Cogniet, and in 1844 produced *Cincinnatus Receiving the Deputies of the Senate*. For this work he was awarded the *grand prix de Rome*. His picture of *Electra*, exhibited at Philadelphia in 1876, attracted much attention. His principal work is a series in the chapel of St. Geneviève in Paris, illustrating incidents in the life of that saint. His *Landing of the French Troops in the Crimea* is in the museum at Versailles. His work is academic and conventional. He is a chevalier of the Legion of Honor.

BARRIAS, LOUIS ERNEST, French sculptor, brother of preceding, was born in Paris, April 13, 1841. He was a pupil under Cogniet, and his production of 1861, *Chryseis Returned to her Father by Ulysses*, was very favorably received, as was also his *Foundation of Marseilles* of 1865. Among his other productions are *The First Funeral: Adam and Eve Bearing the Body of Abel;* and *Music* and *Song*, marble statues for the grand stairway of the Hotel de Ville, Paris. He was elected to the Academy of Fine Arts on the 29th of March, 1884.

BARRICADES, fortifications made to obstruct the progress of an enemy, or to serve as a defense. They may be built of earth, trees, wagons, paving-stones, or any material at hand. The name at once suggests the famous barricades thrown up at various revolutions in the streets of Paris; they were the scenes of desperate fighting. For an account of "Day of the Barricades," see PARIS, Vol. XVIII, p. 291.

BARRIE, capital of Simcoe County, central Ontario, Canada, is at the western end of Lake Simcoe and on the Grand Trunk railway. It is 65 miles N.W. of Toronto; has a large trade and important manufactures of woolen goods. There is a line of steamboats upon Lake Simcoe. Population 1891, 5,550.

BARRIE, JAMES MATTHEW, a Scotch story-writer; was born May 9, 1860, at Kirriemuir, Forfarshire, educated at Dumfries Academy and at the University of Edinburgh, where he graduated in 1882; went to Nottingham and then to London as a journalist, and contributed stories of lowly Scotch life to periodicals under the pen-name of "Gavin Ogilvy"; published his first volume, *Better Dead*, in 1887,—a satire on London life; gained celebrity by the pathos and fidelity to life and character of his *Auld Licht Idylls* and *A Window in Thrums;* added to these *When a Man's Single; My Lady Nicotine; The Little Minister* and *Sentimental Tommy*. He also made plays, of which *Jane Annie* was written in collaboration with Conan Doyle, while *Walker, London* and *The Professor's Love-Story* were received with warmth of applause. He is a master of delineation in presenting the homely sincerities and virtues of the lowly modern and sequestered Scotch.



JAMES M. BARRIE.

BARRIER ACT. See PRESBYTERIANISM, Vol. XIX, p. 682.

BARRIÈRE, JEAN FRANÇOIS, historian, was born in Paris, May 12, 1786, and died there, in August, 1868. With Berville he edited *Mémoires Relatifs à la Révolution Française* (47 vols.). He wrote *Mémoires Relatifs au XVIIIième Siècle.*

BARRIÈRE, THÉODORE, a French dramatist, was born in Paris in 1823, and died there, Oct. 16, 1877. He wrote *Les Faux Bonhommes; Cendrillon; Le Démon de Jeu; L'Ange de Minuit; Malheur aux Vaincus;* and, in travesty of Dumas' famous *Dame aux Camélias, Filles de Marbre.*

BARRIER REEF, a reef about 300 miles in length, extending along the northeast coast of Australia. See AUSTRALIA, Vol. III, p. 108.

BARRIER TREATIES, the name of three treaties concluded between the Dutch and English. The first treaty was made, through the negotiations of Lord Townsend, in 1709, the Dutch agreeing to maintain the English queen's title and the Protestant succession; the English, at the same time, to help the Dutch preserve their border or barrier towns. In 1713, at Utrecht, a similar treaty was concluded; and in 1715 the third treaty was signed, at Antwerp, between England, the Netherlands and the Emperor Charles VI, and was of the same tenor, save that the parties to the treaty agreed to uphold the "pragmatic sanction" that conveyed the Austrian crown to Maria Theresa.

BARRINGTON, GEORGE, a thief and an author, was born at Maynooth, Ireland, in 1755. While a youth he ran away to London, where he became a notorious pickpocket, one of his crimes being the robbing of Prince Orloff of a snuff-box set with diamonds, valued at $150,000. In 1790 he was sentenced to transportation to Botany Bay, but on the voyage he revealed a conspiracy among the convicts, and was rewarded in 1792 by having his sentence commuted. At Paramatta, New South Wales, he became superintendent of the convicts, and high constable. He wrote *A Voyage to Botany Bay; The History of New South Wales;* and *The History of New Holland.* "True patriots all; for, be it understood, we left our country for our country's good," is a familiar quotation. It is from a prologue written by him for the opening of the playhouse at New South Wales.

BARRINGTONIA, a genus of exogenous trees and shrubs, natives of tropical countries, and generally very beautiful, both in foliage and flowers, belonging to the *Myrtaceæ.* The stamens are very numerous, and form a conspicuous part of the flower. The fruit is fleshy, with bony seeds lodged in pulps. The Moordilla (*Barringtonia speciosa*) is described as a tree which much attracts the attention of travelers in Ceylon. It has dark, glossy leaves, and crimson-tipped white flowers. Fruits of *Gustavia speciosa* give a yellow hue to children who eat them.

BARRIOS, JUSTO RUFINO, statesman, was born in San Lorenzo, Guatemala, July 17, 1835; died in Chalchuapa, April 2, 1885. He was educated for and practiced at the bar. In 1867 he placed himself at the head of a band of revolutionary volunteers and fought with varying success. In May, 1871, he united with others against the government of Cerna. After various encounters, Barrios entered the capital and dissolved the government. General Granados became president, and Barrios continued at the head of the army. This order of things was hardly established before several counter-revolutions took place, one of them instigated by President Medina of Honduras. All these disturbances being quelled, Barrios became president of Guatemala on June 4, 1873. Before that time, as president *pro tem.*, he had decreed freedom of the press and the suppression of religious orders. Peace continued until 1876, when the states of Salvador and Honduras united with the reactionary party of Guatemala. Barrios made a valiant defense, and the national assembly approved of all his acts. In 1879 a liberal constitution was promulgated, and on March 1, 1880, General Barrios was again elected president for the term of six years, and his administration did much for the tranquillity and internal improvement of the state. He traveled through the United States and Europe during part of his term of office, and returned to his own country in 1884. On Feb. 28, 1885, after consultation with the presidents of Salvador and Honduras, he published a proclamation intended to effect the union of all the Central American republics as one state, but cabals on the part of the president of Salvador frustrated this purpose and led to renewed warfare. During an attack made by Barrios on the forces of Salvador, he was fatally wounded, and had a son killed by his side. After his death his widow retired to New York City, and a son entered the United States Military Academy at West Point.

BARROIS, CHARLES, geologist, was born at Lille, France, April 21, 1851. He became professor of natural sciences at the University of Lille, from which institution he had graduated in 1873. He was a versatile and voluminous contributor to geological literature; official geologist of Britanny, and foreign member of the Geological Society of London. He is the author of *Le Terrain Crétacé Supérieur de l'Angleterre et de l'Irlande; Les Terrains Anciens des Asturies et de la Galice,* and *Faune du Calcaire d'Erbray.*

BARRON, a city and capital of Barron County, northwestern Wisconsin, is on the Vermillion River, and 91 miles by rail N.E. of Minneapolis, Minnesota. There are flour, woolen, and wood-working factories here. Population 1890, 829; 1895, 1,204.

BARRON, JAMES, naval officer, was born in Virginia in 1769; died in Norfolk, Virginia, April 21, 1851. As a boy he entered the United States service; was made lieutenant in the navy in 1798, captain in 1799, and commodore, in command of the *Chesapeake,* in June, 1807, a vessel of 38 guns. His ship was met by the British frigate *Leopard,* of 50 guns, whose captain demanded the surrender, from among the American crew, of several alleged British deserters. To this demand Barron demurred, and the *Leopard* opened fire, killing 3 and wounding 18 of the *Chesapeake's* men, and the latter, after firing but one gun, hauled down the American ensign, and, after a conference, the alleged deserters were carried away on the British vessel. The British government promptly repudiated the action of the captain of the *Leopard,* the alleged "deserters" were

restored on board the *Chesapeake*, and a monetary indemnity paid to our government. Commodore Barron was tried by courtmartial and suspended from rank and pay for five years. On the expiration of his term he was refused an active command, and kept on shore duty. In 1820 Commodore Decatur, having severely reflected on his conduct in the *Chesapeake* affair, was challenged by Barron to fight a duel, in which Decatur was killed and Barron severely wounded. In succession, Barron became senior officer of the United States navy in 1839.

BARROSA, a village of Spain, 16 miles S. of Cadiz. Here General Graham, in 1811, with a handful of English troops, was victorious over the French, after his Spanish allies had retreated. More than 2,000 French were killed; 300 prisoners and 6 pieces of cannon were taken.

BARROT, Camille Hyacinthe Odillon, jurist and statesman, was born at Villefort, Lozère, France, July 19, 1791; died at Bougival, Aug. 6, 1873. In 1814 he became an advocate in the court of cassation, and soon acquired reputation as an eloquent pleader. At the revolution of 1830 he was one of the three commissioners appointed by the provisional government to accompany Charles X from Rambouillet to Cherbourg. Though an active promoter of the revolution, he is said to have used his influence to dissuade Lafayette from accepting the presidency of the new republic. Under the new government he was appointed prefect of the department of the Seine, but resigned this office in a few months, and also declined the post of ambassador at Constantinople, offered by Louis Philippe. He took a conspicuous part in the reform movement of 1847, and attended political gatherings which led to the revolution of 1848. In 1848–49 he was minister of justice, and president of the council in the first cabinet of Louis Napoleon; he retired from political life on the *coup d'état* of 1851.

BARROW, a river in the southeast of Ireland, next in importance to the Shannon. Its head is in Queen's County, and its course is south as it flows through Carlow and divides the counties of Wexford and Kilkenny. Near New Ross the Nore and Suir rivers join it, and they are called "The Three Sisters." The mouth of the Barrow, called Waterford harbor, is nine miles long. The river is 100 miles long, but is tapped by a branch of the Grand Canal, so that it gives navigation from Waterford to Dublin, a distance of 120 miles.

BARROWE, Henry, an English lawyer who preached against the Roman Catholics and Puritans. See Independents, Vol. XII, p. 724.

BARROWS, Elijah Porter, Presbyterian minister and writer upon biblical subjects; was born at Mansfield, Connecticut, Jan. 5, 1805. He graduated at Yale in 1826; taught school in Hartford for five years; was ordained in 1832, and became pastor of the first Free Presbyterian Church, New York City, in 1835. In 1853 he was made professor of Hebrew at Andover Theological Seminary, and in 1872 accepted a similar professorship in the Oberlin Theological Seminary. He is the author of *Companion to the Bible; Sacred Geography and Antiquities;* and many contributions to *Bibliotheca Sacra*. He died at Oberlin, Ohio, Sept. 14, 1888.

BARROWS, John Henry, Presbyterian minister, was born at Medina, Michigan, July 11, 1847. He graduated at Olivet College, Michigan, and studied at Yale, Union and Andover theological seminaries. In 1881 he began the pastorate of the First Presbyterian Church in Chicago, where he became a famous pulpit orator. He is best known, perhaps, as the chairman of the general committee on religious congresses in connection with the World's Columbian Exposition. Early in 1896 he resigned his pastoral charge and went to India to deliver lectures on religious subjects, under the auspices of the Haskell endowment of the University of Chicago. He is the author of *The Gospels Are True Histories; I Believe in God, the Father Almighty;* and *Henry Ward Beecher, the Pulpit Jupiter.*

BARROWS, Samuel June, editor and Unitarian minister; was born in New York City, May 26, 1845. After graduation at Harvard Divinity School, he studied at Leipsic University, Germany; was at first a Baptist and then a Unitarian minister. From 1867 to 1869 he was the secretary of William H. Seward. In 1881, after four years' pastorate at Dorchester, Massachusetts, he became editor of the *Christian Register*. *The Doom of the Majority; A Baptist Meeting-House; Science and Immortality;* and *The Slaybacks in Camp*, are from his pen.

BARRUNDIA, José Francisco, statesman, was born in Honduras, Central America, in 1779; died in New York City, Aug. 4, 1854. He headed the revolutionary party in its struggle against Spain for independence; was the author of the decree for the abolition of slavery, and in 1829 was made president of the republic. He wrote a narrative of Central American history, and in 1852 was called again to the presidency, but declined, as three out of the five republics had seceded. He went to the United States as minister from Honduras, and died while on that mission.

BARRY, a small island in the Bristol Channel, between Wales and the southwest counties of England; is 12 miles S.W. of Cardiff. It has the ruins of an ancient castle and two chapels.

BARRY, Alfred, bishop of Sydney, son of the architect, Sir Charles Barry, was born in London in 1826. He was graduated as a wrangler at Trinity College, Cambridge, and in 1850 was ordained in the established church; in 1868 was made principal of King's College, London. In 1871 he was made a canon of Worcester; was appointed in 1875 honorary chaplain, and in 1880 chaplain in ordinary to the Queen. He was consecrated bishop of Sydney, metropolitan of New South Wales, and primate of Australia in 1884. In 1891, having resigned the bishopric of Sydney in 1889, he was appointed canon of Windsor. He is the author of a *Life* of his father; *What Is Natural Theology; The Teacher's Prayer-Book; The Parables of the Old Testament; The Manifold Witness for Christ; Christianity and Socialism*, and some biblical commentaries.

BARRY, John, naval officer, was born in Wexford County, Ireland, in 1745; died in Philadelphia, Sept. 13, 1803. He followed the seas, becoming

master of a trading-ship; offered his services to the American colonies on their revolt from the British crown; in February, 1776, became commander of the *Lexington*, with which he captured the British tender *Edward;* was transferred to the command of the frigate *Effingham;* in the winter of 1776–77, assisted at the battle of Trenton with some heavy artillery; in 1777, with four boats, captured a British war-schooner in the Delaware River; in 1778 commanded the *Raleigh*, which was pursued and driven on shore by a British squadron; was transferred to the *Alliance*, and in a severe engagement captured the *Atalanta* and the *Trepassy*, and was wounded. In 1794, when the new navy was organized, he was senior officer, with the rank of commodore.

BARRY, JOHN WOLFE, an English civil engineer, son of Sir Charles Barry, and younger brother of the late Bishop of Sydney, was born in 1836. He was educated at Trinity College, Glenalmond, and at King's College, London. In 1867 he left the service of the engineer, Sir John Hawkshaw, to whom he had been articled, and built up a large private practice. In 1872 he laid out the Buenos Ayres and Rosario railroad, in the Argentine Republic. Among his important achievements in London are the Earl's Court Station; the St. Paul's Station; bridge over the Thames at Blackfriars; and the Barry dock, near Cardiff, the largest single dock in the United Kingdom. He also supervised two extensions of the London underground railway. He is the author of *Railway Appliances* and *Railway and the Locomotive.*

BARRY, MARTIN, physician and animal embryologist, was born at Fratton, Hampshire, England, in 1802; died at Beccles, in Suffolk, in 1855. He received his medical education in London, and at the University of Edinburgh, receiving at the latter the degree of M.D. in 1833. His observations of the penetration of spermatozoa into the ovum and of the segmentation of the yolk of mammals were very important additions to the knowledge of animal embryology. Dr. Barry acted as house-surgeon to the Edinburgh Royal Maternity Hospital, and benevolently gave his professional services to the poor.

BARRY, PATRICK, horticulturist, was born near Belfast, Ireland, May, 1816, and died in Rochester, New York, June 23, 1890. He was the editor of the *Horticulturist.* His *Fruit Garden* is a standard authority upon fruit-culture.

BARRY, WILLIAM FARQUHAR, an American soldier, was born in New York City, Aug. 18, 1818; died near Baltimore, Maryland, July 18, 1879. He became colonel of the Second Artillery and a brevet brigadier-general in the United States army. After his graduation from West Point in 1838, he first served in the Indian war in Florida (1852); then in the Mexican War, acting as aide-de-camp to Major-General Worth. He won the rank of captain in the Florida campaign. After service on the Western frontier, he was appointed, at the outbreak of the Civil War, chief of artillery of the Army of the Potomac, having the rank of major. Sept. 1, 1864, on account of his gallant service at the fall of Atlanta, he was brevetted colonel in the regular army and major-general of volunteers. He rendered distinguished service in the campaign against the forces under Gen. J. E. Johnston, and, after the surrender of the latter, was breveted brigadier-general, and soon afterward major-general in the regular army. Throughout the summer of 1862 he served in the field as commander of the artillery of the Army of the Potomac. He later had command of the artillery of the armies under General Sherman, and was in command of the defenses of Washington. After the war he was put in command of the northern lake frontier, and in 1867 took charge of the artillery school at Fortress Monroe. He was one of the authors of *Engineer and Artillery Operations of the Army of the Potomac, A.D. 1861–62*, and of *A System of Tactics for the Field-Artillery of the United States.*

BARRY CORNWALL, a pen-name of PROCTOR, W. F.; q. v., Vol. XIX, p. 792.

BARTER, the exchange of one commodity for another, instead of the sale of a commodity for money. See MONEY, Vol. XVI, p. 722.

BARTHÉLEMY, ANATOLE JEAN BAPTISTE ANTOINE DE, archæologist, was born at Reims, Marne, France, July 1, 1821, was secretary-general of the prefecture of the department of Côtes-du-Nord, and, later, subprefect of the arrondissement of Belfort. Among his numerous publications upon archæological matters are *Report upon Some Religious and Feudal Monuments in the Department of the Loire; Coins of the Aulerci; Studies upon the Coins of the Dukes of Bourgogne; Complete Manual of Ancient Numismatics; Study upon the Revolution in Brittany*; and *Studies in Heraldry.*

BARTHÉLEMY SAINT-HILAIRE, JULES, scholar, journalist and French Senator, was born in Paris, Aug. 19, 1805; died there, Nov. 24, 1895. During 1828–30 he was one of the editors of the *Globe*, a politically aggressive paper of Paris. In 1833 he retired from political strife, and in 1838 became professor of Greek and Latin philosophy in the Collége de France. Among his numerous writings are a translation of the works of Aristotle, works on Buddha and Buddhism, studies in Alexandrian and Baconian philosophy, and pious discussions of the relation of religion to science. He was elected a member of the National Assembly in 1848; was secretary to President Thiers, 1872–73, and in 1875 was made a Senator for life; Minister for Foreign Affairs in Ferry's cabinet, literary executor of Victor Cousin, dean of the Institute of France.

BARTHOLDI, FRÉDÉRIC AUGUSTE, a French sculptor, born in Colmar, in Alsace-Lorraine, April 2, 1834. He studied painting in Paris under Ary Scheffer, but abandoned this branch of art to devote himself to sculpture. He exhibited some of his works in marble and bronze in 1847. His bronze statue of Lafayette, made in 1872, was placed in Union Square, in New York City, in 1876, and in the same year he exhibited several works at the Centennial



FRÉDÉRIC AUGUSTE BARTHOLDI.

Exhibition in Philadelphia, for which he received a bronze medal. In 1865 he was decorated with the cross of the Legion of Honor, and has since been made a commander of that order. His works are numerous, and many of them occupy public places in French cities, the last to be placed being the statue of Washington and Lafayette, dedicated in Paris in 1895, as the gift of the New York *World* to that city. The work on which his fame principally rests is the colossal statue of *Liberty Enlightening the World*, which was cast at a cost of more than 1,000,000 francs, contributed by the people of France, and not including any compensation for his own ten years of labor. The statute was given to the United States as an expression of the fraternal feeling of France. July 4, 1880, the statue was formally delivered to the American minister in Paris, and Oct. 28, 1886, the dedication exercises were held at Bedloe's Island, in New York harbor, where the statue had been erected on a pedestal costing $300,000, raised by popular subscription. The statue is 152 feet 2 inches in height, and mounted on the pedestal reaches 305 feet 11 inches above low-water mark.

BARTHOLOMEW, Edward Sheffield, sculptor, was born in Connecticut in 1822; died in Naples, May 2, 1858. He first practiced dentistry, but soon turned his attention to the study of painting and sculpture. He went to Italy in 1850, and his professional life was spent in Rome. Some of his works are *Blind Homer Led by His Daughter; Eve; Youth and Old Age; Eve Repentant; Ganymede; Campagna Shepherd Boy; Genius of Painting;* and *Washington.* A large number of his works are in the Wadsworth gallery, Hartford, Connecticut. He showed much fancy and inventive power in his works.

BARTHOLOMEW FAIR, an annual festival and market held at West Smithfield, London. The charter for the fair was granted by Henry I to his jester, a monk named Rafer, who founded the St. Bartholomew Church and priory. The charter was granted in 1133, and the fair, which was a great merry-making, opened each year on August 24th (O. S.). Under the auspices of the church, miracle-plays and mysteries were presented. The visitors engaged in all sorts of sports, contests and trading. The fair lasted several days and attracted great crowds. It at length ceased to be a place of legal traffic, and became a nuisance; in 1855 it was abolished.

BARTHOLOMEW'S HOSPITAL. See England, Vol. VIII, p. 254.

BARTHOLOMEW, Saint, Massacre of. See France, Vol. IX, pp. 561, 562.

BARTIZAN. See Architecture, Vol. II, p. 460.

BARTLETT, John, editor and publisher; born at Plymouth, Mass., June 14, 1820. In 1865 his literary tastes led him to join the publishing house of Little, Brown and Co., Boston, of which, 12 years later, he became senior partner. In 1875 he issued *Familiar Quotations*, being "Passages, phrases and proverbs traced to their sources in literature." Of this invaluable work a ninth edition appeared in 1893. In 1894 he published a monumental *Concordance to the Dramatic and Poetical Works of Shakespeare* (comprising 400,000 entries).

BARTLETT, John Russell, historiographer and bibliologist, was born in Providence Rhode Island, Oct. 23, 1805; died there, May 28, 1886. In early life he was in the banking business, but abandoned it to become a book-importer. He was corresponding secretary of the American Historical Society, one of the founders of the American Ethnological Society, and one of the commissioners appointed in 1850 to fix the boundary between Mexico and the United States, and secretary of state for Rhode Island for 17 years; librarian to John Carter Brown. Among his books are *The Progress of Ethnology; A Dictionary of Americanisms; Literature of the Rebellion*; *Primeval Man;* works of local history, and four volumes of a *Bibliotheca Americana.*

BARTLETT, Joseph, an adventurer and satiric poet, was born at Plymouth, Massachusetts, June 10, 1762, died in Boston, Oct. 20, 1827. He graduated at Harvard in 1782, and after studying law went to England, where he fell in with gamblers, lost his money, was sent to jail, and earned his release by playwriting. He was by turns an actor, importer, soldier (in Shay's rebellion), lawyer and a member of the Maine legislature. He delivered an original poem, *Physiognomy*, at a meeting of the Harvard Phi Beta Kappa Society, and at a Fourth of July celebration at Boston recited a poem entitled *The New Vicar of Bray*, which became famous. In 1805 he edited the *Freeman's Friend.*

BARTLETT, Josiah, physician and statesman, first governor of New Hampshire, was born at Amesbury, Massachusetts, Nov. 21, 1729; died in New Hampshire, May 19, 1795. He studied and practiced medicine; discovered and applied new remedies. In 1765 he was delegate to the legislature. He was a zealous Whig, and as a member of the Continental Congress, was the first to vote for the Declaration of Independence and the second to sign it. Dr. Bartlett was appointed general naval agent (1776); elected to Congress (1778); successively chief justice of the court of common pleas, muster-master of troops, justice of the superior court, chief justice, and was three times chosen president of New Hampshire, the governorship of which state was his last office.

BARTLETT, Samuel Colcord, Congregational minister, was born at Salisbury, New Hampshire, Nov. 25, 1817, and graduated at Dartmouth College in 1836. He received his theological training at Andover, and became in 1846 professor of intellectual and moral philosophy in Western Reserve College, Ohio. In 1858 he was made professor of biblical literature in the Congregational Theological Seminary in Chicago, and from 1877 until 1892 was president of Dartmouth College. *Life and Death Eternal; Future Punishment; Sketches of Missions of the American Board; From Egypt to Palestine;* and *Sources of History in the Pentateuch*, are among his writings.

BARTLETT, Truman H., sculptor, was born at Dorset, Vermont, in 1835. *The Angel of Life; Wisdom; The Wounded Drummer-Boy;* and the Wells monument at Hartford, are among his principal works. His professional life has been spent in Con

necticut cities and New York, and his most important work has been done in bronze.

BARTLETT, WILLIAM ALVIN, Presbyterian minister, was born in Binghamton, New York, Dec. 4, 1834. He was educated at Hamilton College, at Union Theological Seminary, and at the German universities of Halle and Berlin. He held various pastorates in this country, and finally became pastor of the New York Avenue Church in Washington, District of Columbia. He was a frequent contributor to periodicals and has published a story, *The Lost Image.*

BARTLETT, WILLIAM FRANCIS, brevet major-general of United States volunteers, was born at Haverhill, Massachusetts, June 6, 1840; died at Pittsfield, Massachusetts, Dec. 17, 1876. Directly after his graduation from Harvard in 1861, the Civil War having begun, he volunteered as a private soldier. In July of the same year he was made captain in the Twentieth Massachusetts Infantry. Both in the siege at Yorktown, and in the assault which he led upon Port Hudson, Louisiana, May 27, 1863, he received severe wounds. After the former engagement one of his legs was amputated. He led the attack upon Port Hudson as colonel of the Forty-ninth Massachusetts, and here was so conspicuous in his daring that the Confederate officers are said to have ordered that he should not be shot at. In later service he displayed the same remarkable fearlessness; notably at Petersburg, July 30, 1864, where he led the assaulting column on the explosion of the famous mine.

BARTLETT, WILLIAM HENRY, artist and author, was born in London, March 26, 1809. He died at sea, on a voyage from Malta to Marseilles, Sept. 13, 1854. He was a pupil of Britton, the architect, who afterward employed him to make drawings for his *Cathedral Antiquities* and *Picturesque Antiquities of English Cities.* He visited America several times, and traveled in Europe and in the Holy Land, enriching his portfolio with numerous interesting scenes. There were devoted to these countries no less than 19 quarto volumes, containing about 1,000 engravings from his sketches, and letterpress from his own pen, and those of his fellow-travelers, Dr. W. Beattie, N. P. Willis and Miss Pardoe. *Walks About Jerusalem; The Topography of Jerusalem; The Nile Boat;* and *Pictures from Sicily*, are among his other works.

BARTLETT, WILLIAM HOLMS CHAMBERS, soldier and mathematician, was born in Lancaster County, Pennsylvania, in 1809; died at Yonkers, New York, Feb. 11, 1893. Having removed to Missouri, he was sent from that state to the United States Military Academy at West Point, where he graduated with honors in 1826. Upon graduation he received the commission of a lieutenant of engineers, and served for two years as assistant professor of mathematics at West Point. Later, he superintended the building of Fortress Monroe, Fort Adams, and other coast defenses, and in 1832 became assistant to the chief engineer at Washington, District of Columbia. Two years later he was appointed professor of natural philosophy at West Point, where he continued up to his retirement with the rank of colonel, Feb. 14, 1871. He then became actuary of the Mutual Life Insurance Company of New York City. He prepared the following textbooks: *Treatise on Optics; Synthetical Mechanics; Acoustics and Optics; Analytical Mechanics;* and *Spherical Astronomy.*

BARTOL, CYRUS AUGUSTUS, Unitarian minister and an author, was born at Freeport, Maine, April 30, 1813; died in 1896. He graduated at Bowdoin College in 1832, and at Cambridge Divinity School in 1835. Two years later he was made assistant pastor of the West Church (Unitarian) of Boston, where he became a member of the famous Transcendental Club. Among his several works are *Discourses on the Christian Spirit and Life; Pictures of Europe; Radical Problems;* and *The Rising Faith.* His contributious to periodical literature had a considerable religious effect.

BARTOLI, DANIELE, a scholarly Jesuit, born in Ferrara, Italy, in 1608; died at Rome in 1685. He was rector of the Jesuit College at Rome. He was author of *Life of Ignatius Loyola.* His *History of the Company of Jesus*, an account of Jesuit missions, is his most valuable work.

BARTON, BERNARD, an English poet, was born in London, Jan. 31, 1784; died at Woodbridge, Feb. 19, 1849. His parents were members of the Society of Friends, to whose tenets Barton adhered through life. In 1810 he became clerk in a banking-house at Woodbridge, in which situation he continued until within two years of his death. His first poetical efforts were published in 1812, under the title *Metrical Effusions.* These brought him into correspondence with the poet Southey. *Poems by an Amateur* and *Poems* (1820) increased his reputation and gained him the friendship of Lamb and Byron. After his death, his daughter published *Selections from the Poems and Letters of Bernard Barton.*

BARTON, CLARA, philanthropist, was born in Oxford, Massachussetts, in 1826. She first went to school in Clinton, New York, afterward became a teacher and founded a free school in Bordentown, New Jersey. In 1854 Miss Barton became clerk in the United States Patent-Office. When the Civil War began she devoted herself to the care of wounded soldiers on the battlefield, and in 1864 had charge of the hospitals of the Army of the James. In 1865 she visited Andersonville, Georgia, to mark the graves of the Union soldiery. In 1866 and 1867 she gave lectures on her experiences during the war, and visited Europe to recuperate her health. During the war between Germany and France she volunteered in humane and hospital service, and assisted the Grand Duchess of Baden in the establishment of hospitals. For her services she was decorated with the golden cross of Baden and the iron cross of Germany. In 1881, on the organization of the American Red Cross Society, she became



CLARA BARTON.

its president, and in 1884 represented the United States at the Red Cross conference in Geneva, Switzerland. She was also delegate to the international peace convention at Geneva in 1884, and a special commissioner for foreign exhibits at the New Orleans exhibition. In 1883 the United States Senate committee on foreign relations requested her to prepare a *History of the Red Cross*, which was published at the government printing-office, Washington. She rendered beneficent services during the Ohio floods, the Michigan fires, the Charleston earthquake and other calamities of national import. In January, 1896, the Red Cross Society of America raised a relief fund for the benefit of the sufferers from the Turkish atrocities in Armenia. Although it was announced that the Sultan would not permit the society to distribute relief among the Christian sufferers, Miss Barton started for Armenia early in February, determined, as the representative of the Red Cross Society, to secure the disposition for the benefit of the Armenians of theconsiderable funds raised in their behalf. See also RED CROSS SOCIETIES, in these Supplements.

BARTON, THOMAS PENNANT, born in Philadelphia in 1803; died there, April 5, 1869. He was the son of Dr. Benjamin S. Barton. He was a man of literary taste and had a fine library of some 12,000 volumes, which included 2,000 rare editions of Shakespeare, and which after his death was acquired by the Boston Public Library.

BARTON, WILLIAM, soldier of the Revolutionary War, was born at Warren, Bristol County, Rhode Island, May 26, 1748; he died in Providence, Oct. 22, 1831. The exploit which made him famous was his bold capture of the person of the British General Prescott, upon the night of July 10, 1777. For this exploit Congress presented him with a sword and he was made brevet colonel. He received a grant of land in Vermont, where, at Danville, he was afterward imprisoned for fourteen years, on account of failure to pay a judgment brought against him in a contested claim to land. Upon his visit to America in 1825, General Lafayette satisfied the claim against Barton without the latter's knowledge.

BARTON, WILLIAM PAUL CRILLON, American botanist and physician, was born in Philadelphia, Nov. 17, 1786; died there, Feb. 29, 1856. He graduated at Princeton College in 1805, and took a degree in medicine at the University of Pennsylvania in 1808. He prepared a valuable thesis on *Nitrous Oxide Gas*, which was authoritative upon that subject for many years. He was appointed surgeon in the United States navy and organized its first bureau of medicine and surgery. In 1815 he succeeded his uncle, Dr. Benjamin S. Barton, as professor of botany at the University of Pennsylvania. His writings include *Medical Botany;* a *Flora of North America*, and *Vegetable Materia Medica of the United States*. At the time of his death he was senior surgeon of the navy.

BARTON BEDS, a strata of sand and clay included in the Bagshot beds. See GEOLOGY, Vol. X, p. 361.

BARTON-ON-HUMBER, an ancient town in North Lincolnshire, England, formerly one of the important ports of the Humber River. Its chief products are ropes, sacking, pottery, tiles, brick and whiting. Quarries in the vicinity yield chalk and oölite. St. Peter's Church, built about the time of the Conquest, and the ruins of Thornton Abbey, a short distance from the town, are objects of interest.

BARTON'S BUTTONS OR IRIS ORNAMENTS. John Barton, an English engraver, succeeded by means of a dividing-engine, in engraving on steel and similar surfaces lines which were distant from one another only two to ten thousandths of an inch. Steel dies thus marked with hair-lines are used to stamp buttons and articles of ornament. These, when stamped, reflect, in artificial light, the colors of the spectrum and form very brilliant ornaments. See under LIGHT, *Colors of Grooved Instruments*, Vol. XIV, p. 609.

BARTOW, capital of Polk County, south-central Florida, is on two railroads, 76 miles N.E. of Punta Gorda, and 37 E. of Tampa. It lies in the phosphate belt and in a good orange district. Population 1880, 77; 1890, 1,386.

BARTRAM, JOHN, physician and botanist, was born near Darby, Pennsylvania, March 23, 1699; died at Kingsessing, Pennsylvania, Sept. 22, 1777. Linnæus called him the "greatest natural botanist in the world." On the Schuylkill River, at the place called Kingsessing, he laid out a botanical garden which was the first of the kind in America. He traveled to make botanical collections, wrote accounts of his excursions, and received the honorary appointment of American botanist to George III. His homestead was purchased for an herbarium and garden by the city of Philadelphia.

BARTRAM, WILLIAM, botanist, son of the preceding, was born at Kingsessing, Pennsylvania, Feb. 9, 1739, died at the same place, July 22, 1823. He was a botanist, and traveled in the Eastern states, making scientific collections. For several years he raised indigo on the St. Johns River, in Florida. He published books descriptive of his travels, and made a very complete list of native birds. His fame rests chiefly on his *Travels Through North and South Carolina*, which was translated into several European languages, and is known as the "starting-point of a distinctively American school of ornithology."

BARTSCH, KARL FRIEDRICH ADOLF KONRAD, German philologist, was born at Sprottau, Prussian Silesia, Feb. 25, 1832; died in Heidelberg, Feb. 19, 1888. He was educated at the gymnasia of Gleiwitz and Breslau, and at the universities of Breslau and Berlin. In 1858 he was appointed to a professorship at Rostock, having previously been engaged in philological studies at the libraries in Nuremburg and in Paris. He also studied at London and Oxford. From 1871 until his death he was a professor in the University of Heidelberg. He was foremost among specialists in the mediæval languages and literatures of France and Germany; was an untiring worker and a prolific writer. His *Investigations upon the Nibelungenlied* is an exhaustive and authoritative work upon that subject. He pub-

lished textbooks for beginners in the study of old French and Provençal. Others among his numerous works are *German Lyric Poets from the Twelfth to the Fourteenth Century; The Nibelungenlied* (a translation into modern German); *Old French Romances and Pastorals; Outline of the History of the Literature of Provence;* and *The Song of Roland.*

BARU, a fine, woolly substance, found at the base of the leaves of the *Saguerus saccharifer*, one of the most valuable sago palms of the Indian Archipelago. It is used for calking ships, for stuffing cushions, and for other similar purposes.

BARWOOD. See CAMWOOD, in these Supplements.

BARY, HEINRICH ANTON DE, a German botanist, was born at Frankfort-on-the-Main, January 26, 1831, and received his scientific education at Heidelberg, Marburg and Berlin, intending to follow the profession of medicine. He was appointed professor of botany at Freiburg in 1855, at Halle in 1867, and at Strasburg in 1872, becoming rector of the latter university in the same year. He was an authority on the algæ and fungi. In these departments of botany he published numerous works, several of which were translated into English. Among them may be mentioned *Die Morphologie und Physiologie der Pilze, Flechten und Myxomyceten* (1866); *Vergleichende Morphologie und Biologie der Pilze, Mycetozoen und Bacterien* (1885), and *Vorlesungen über Bacterien* (1885). He died Jan. 19, 1888.

BARYCENTRIC CALCULUS. See MÖBIUS, Vol. XVI, p. 540.

BARYE, ANTOINE LOUIS, a French sculptor; born in Paris, Sept. 25, 1795. His father was a master silversmith, who apprenticed him to a Parisian engraver. He served in the army in 1812–14, and afterward took lessons in drawing and modeling from Bosio and Gros. From 1823 to 1831 he became famous for his models and statuettes of wild animals. Among his productions of this class particularly notable are his *Tiger Devouring a Crocodile; Lion Strangling a Boa;* and *Group of Young Bears.* He was equally at home with such animals as the elephant and other jungle beasts. Many of his works are to be seen in America, in the art-galleries of New York, Baltimore and Washington. He made four groups for the pavilion in the Place du Carrousel, Paris. He became professor at the Jardin des Plantes and member of the Institute, and was decorated with the cross of the Legion of Honor. He died in Paris, June 25, 1875. For his method of work, see DRAWING, Vol. VII, p. 450.

BARYTON, a musical instrument now obsolete, called in Italian *viola di bardone.* It had six or seven gut strings, while under the neck were strings of brass, 16 in number, to be played with the thumb. A bow was used on the gut strings. It was in use up to the end of the eighteenth century, but its complicated mechanism and the weakness of its tone rendered it entirely obsolete.

BAS OR BATZ, a small island in the English Channel, belonging to France, situated off the north coast of the department of Finisterre. It is about three miles in length and two in breadth, on an elevation 223 feet above the sea, and is defended by two forts and batteries. It has a lighthouse, and a population of about 1,200, whose chief occupation is fishing.

BASALT, a volcanic rock of feldspar and hornblende, or augite. It is a variety of trap-rock, of conchoidal fracture, compact in texture, and either black or dark-green or gray in color. Its characteristic columnar structure as seen at the Giant's Causeway and at Fingal's Cave is remarkable. See GEOLOGY, Vol. X, p. 235.

BASAL WALL, a term used in the embryogeny of multicellular plants in which root and shoot have become differentiated. In such cases the first segmentation-wall of the spore, dividing into two cells, is called the "basal wall." The two cells thus formed are called *epibasal* and *hypobasal*, from the former of which the shoot and its members are derived, from the latter the root.

BASCLE DE LAGRÈZE, GUSTAVE, a French justiciary and archæologist, born at Pau, Basses-Pyrénées, Aug. 23, 1811. He was the son of a distinguished magistrate of the ancient family of Du Quercy. He studied law in Paris and was admitted to the bar, and filled several positions in the courts of his native city, and in 1881 received the honorary title of councilor. He was elected to the council-general of the Basses-Pyrénées, was a chevalier of the Legion of Honor, and bore foreign decorations. His works on jurisprudence include *Le Droit Criminel à l'Usage des Jurés* (1854); *De la Réorganisation de la Magistrature* (1871); *Le Parlement de Navarre* (1873). His works on archæology are *Chronique du Château et de la Ville de Lourdes* (1845; revised and extended in 1887); *Antiquités du Béarn* (1848); *Le Trésor de Pau* (1851); *Le Château de Pau* (1854); *Histoire Religieuse de la Bigorre* (1864); *La Féodalité dans les Pyrénées* (1864); *Rome et Naples* (1864); *Histoire du Droit dans les Pyrénées* (1867, which obtained complimentary mention at the Concours des Antiquités Nationales in 1868); *Henri IV, Vie Privée, Détails Inédits* (1884); *Pompéi, les Catacombes, l'Alhambra* (1872); and *Le Saut du procureur* (1879).

BASCOM, HENRY BIDLEMAN, a bishop of the Methodist Episcopal Church South; born at Hancock, New York, May 27, 1796. He was licensed to preach when in his nineteenth year. His first work was done in Ohio, on the frontier, where he suffered many hardships. Subsequently he preached in Tennessee and Kentucky. He was appointed chaplain to Congress, and later he accepted the presidency of Madison College, Uniontown, Pennsylvania. He was called to the presidency of four different colleges, three calls coming at the same time. In 1842 he became president of Transylvania University, Kentucky. He was a delegate to several important Methodist conventions, and became editor of the *Southern Methodist Quarterly Review.* The works of Bishop Bascom, chiefly sermons, lectures and essays, were edited by Rev. T. N. Ralston, and published in 1856. He died in Louisville, Kentucky, Sept. 8, 1850.

BASCOM, JOHN, born at Genoa, New York, May 1, 1827. He graduated at Williams College and at Andover Theological Seminary; was tutor and also professor at Williams. While teaching there he

was pastor of a church in Vermont. In 1874 he was called to be president of the Wisconsin University, which position he resigned in 1887. Among his works are *Political Economy* (1859); *Æsthetics* (1862–81); *Philosophy and Rhetoric* (1865); *Principles of Psychology* (1869); *Philosophy of Religion* (1876); *Comparative Psychology* (1878); *Ethics* (1879); *Sociology* (1887); *New Theology* (1891); and *An Historical Interpretation of Philosophy* (1893). His writings prove him to be a critic of generous tendencies and modern views.



JOHN BASCOM.

BASE, in chemistry, an alkaline metallic oxid which is capable of forming a salt with an acid; water being formed in the process, the metal replacing the hydrogen of the acid. Organic bases or alkaloids, found in many plants, contain nitrogen, and are considered as substitution compounds of ammonia. See AMMONIUM THEORY, in these Supplements.

BASE OR BASS, in music, is the deepest or lowest part, by whatever instrument it may be performed. The base next to the upper part is most striking, the freest in its movements, and richest in effect. In respect to harmony the base is the most important part in music, containing more frequently the fundamental notes of the chords, while on it is formed the most important and effective figure in music, called "organ-point." Base is also the name of the lowest and deepest quality of the human voice. It only begins to show itself at the years of manhood, and is generally a change from the alto voice of a boy. The name also designates an old stringed instrument, with from five to six strings, played with a bow, while the double-base (contrabass) is the deepest toned of stringed instruments.

*BASEBALL, a game regarding the origin of which much dispute has arisen, many writers asserting that it was evolved from the British game of "rounders," while perhaps as much evidence has been adduced to prove that the New England game of "two old cat" was the source from which it sprung. Regardless of the undetermined question as to its genesis, the fact remains that it has come to be the most popular of all outdoor sports, and distinctively the ideal American field-game. For the early history of the game, see BASEBALL, Vol. III, pp. 406, 407.

First played in the spring of 1857, the pastime remained under amateur control up to 1871, when the professional organization took place. The advance into popularity which the game had made during the first 13 years of its existence afforded the opening for the "National Association of Professional Baseball Players," which was succeeded in 1876 by "The National League of Professional Clubs." From the date of this latter organization such intelligently directed efforts have been made to bring the game to a high standard, to improve its rules, its methods and its government, as to have won for baseball the reputation of being the most honestly conducted field-sport now offered for the delectation of those who delight in displays of manly courage, nerve, pluck and activity. Much patronage, both in numbers and in character, has been attracted to baseball from the fact that the rules of the National League prohibit pool-selling, and even open betting, on any of its club grounds. This fact, together with the exciting sport offered, the short time within which a match can be determined, the skill and agility which the players exhibit, and the high tension of excitement that necessarily ensues as the contest approaches its climax, all combine to establish baseball as a favorite pastime.

Not only are the clubs of the National League and the American Association composed of persons who devote their time and talents to the game, but, throughout the United States, state and other leagues are maintained, and during the season for play some thousands of professional players are constantly engaged in the occupation,—to them a source of handsome incomes.

The principal colleges and universities of the United States have clubs, to the training of which much time is given and attention devoted. Intercollegiate leagues exist, the teams seldom playing outside thereof.

In the ranks of the profession are several men who have been identified with the game from its earliest history. Among these may be mentioned the present president of the National League, Mr. N. E. Young, who has been officially and continuously identified with the game for a quarter of a century; Mr. Henry Chadwick, familiarly called the "Father of Baseball"; Mr. A. G. Mills, who has done much in shaping baseball legislation; Mr. A. G. Spalding, to whose active participation the game owes much of its prominence and favor, both at home and abroad; and Mr. Harry Wright, who was one of the best-known characters connected with baseball, having been active in the ranks of professionals from the inception of the game up to the time of his death in 1895. During his career of almost 40 years he had managed the clubs of several of the leading cities of the Union, always successfully, and was highly regarded among his fellows.

In the summer of 1874 the Boston Baseball Club and the Athletic Baseball Club of Philadelphia crossed the Atlantic and played a series of 14 exhibition games in England and Ireland. Seven games of cricket, the national game of Great Britain, were also played with the best elevens in the principal cities of England and Ireland, in all of which the Americans met with easy and uninterrupted success. Other trips abroad by American players have been: Two to Havana, in 1879 and 1886; and a tour around the world in 1888–89. The Chicago Club and a picked team, known as the All-America, accompanied by newspaper correspondents and others, left Chicago, Oct. 20th, for San Francisco, Honolulu, Auckland, Sydney, Melbourne, and other principal cities of Australia, Colombo in Ceylon, the Pyramids of Egypt, Brin-

*Copyright, 1896, by The Werner Company.

disi, Naples, Rome, Florence, Paris, London, Bristol, Manchester, Liverpool, Birmingham, Glasgow, Belfast, Dublin, Queenstown, New York, Philadelphia and Chicago, arriving April 20th, having made the trip in just six months and played 53 games. This trip marks an epoch in the history of baseball, and was the means of its becoming known throughout almost the entire world. So favorably was the game received in many foreign lands that it was adopted as a prime favorite, and has continued to grow in popularity.

Attendant on the growth and development of the game has been an almost constant change in the regulations governing it, until at the opening of the season of 1896 the playing-rules of professional baseball clubs, as adopted by the National League and American Association of professional baseball clubs, which are accepted as authority by all organizations, both professional and amateur, bear but little resemblance to the original laws. The accompanying diagram will show the lines governing the position and play of the game, and the specifications attached will enable the laying off of the same.

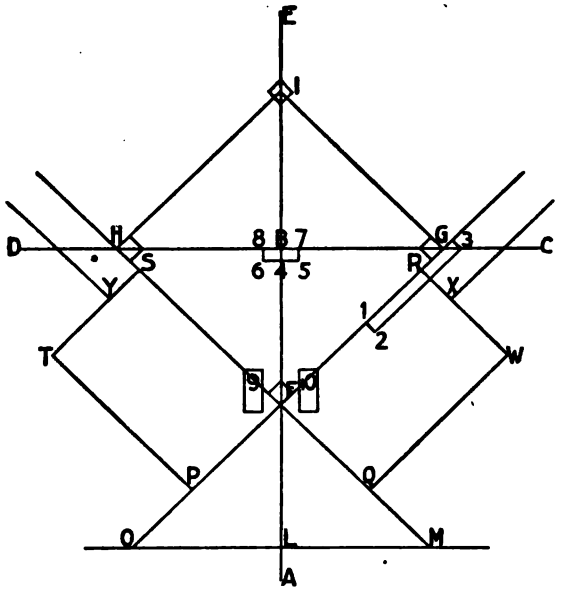



DIAGRAM OF A BASEBALL-FIELD.

The grounds must be a field sufficient in size to enable each player to play in his position as required by the rules.

From A to B is 154 feet, at which point line C D crosses it at right angles. The four bases are marked 63.63945 feet each from the point B. Connecting these points with straight lines forms the diamond, or infield. L is 90 feet from F, and the lines L O and L M are each carried not less than 90 feet from L, these forming the catcher's lines. The foul-line is formed by extending lines F H and F G until they each reach from line M O to the boundary lines of the grounds, which points of intersection should be marked. The players' lines are bounded by the two rectangles F R W Q and F S T P. P and Q are respectively 50 feet from F; R and S, 75 feet each from F, while the lines Q W, R W, P T and S T are projected at right angles from the lines which they intersect. The captain's and coacher's lines extend respectively from X and Y, which are each 15 feet from R and S, and extend at right angles with F G and F H to the boundary lines of the grounds. The three-foot line begins 45 feet from F, and with a width of 3 feet extends to a point 3 feet beyond G. The pitcher's plate is a parallelogram 24 by 6 inches, the point 4 being 60.5 feet from F. The positions of the bases are shown in the diagram, those at G, I and H being 15 inches square, and the one at F, the home-base, being a square with sides 12 inches each. The three first-mentioned should be white canvas bags filled with soft material and securely fastened in their positions, while the home-base and the pitcher's plate should be of whitened rubber and so fixed in the ground as to be even with the surface. The batsman's line is formed by two parallelograms, each 6 feet long by 4 feet wide. They extend parallel with the line A F B, and their inner lines are each 6 inches from the angle formed by the base at F, their centers and the center of said base being in the same line.

The weight of the ball shall be between 5 and 5¼ ounces avoirdupois, and not less than 9 nor more than 9¼ inches in circumference. The bat shall be made entirely of wood, except that the handle may be wound with twine, or a granulated substance applied, not to exceed 18 inches from the end. It shall be round, and not exceed 2¾ inches in diameter at the thickest part, nor exceed 42 inches in length.

No more or less than nine men are allowed to play on each side, one of whom shall act as captain. In addition to these, each side should have present on the field one or more substitute players. Nothing shall be attached to the sole or heel of the shoe other than the ordinary baseball shoe-plate. Gloves of any size, shape or weight are allowed to the catcher and first baseman, but all other players are restricted to a glove weighing not over 10 ounces, and measuring in circumference around the palm of the hand not over 14 inches.

*The Rules of the Game.* An "inning" is the term at bat of each of the opposing sides, and is completed when three players of each side have been legally put out.

A game consists of nine innings, unless sooner decided under the rules, or unless the score be tied, in which latter event the play is continued until a decision is reached.

A "drawn" game is one determined ended by the umpire, on account of rain or darkness, after five innings have been played and the score is equal. If five innings have not been played, it is called "no game." If, however, five innings have been played, and one side is advanced over the other, it is decided in favor of the leading club, and denominated a "called game."

A game is forfeited, in favor of the club not in fault, by an opposing club violating any one of several very equitable rules, among which are: (*a*) inexcusable refusal to appear upon the field or to begin play within five minutes after being ordered so to do; (*b*) refusal or failure to continue play after the game has begun; (*c*) refusal to resume play, after the same has been temporarily suspended, within one

minute after being ordered so to do; (*d*) resorting to dilatory movements to delay the game; (*e*) if a player, when ordered removed by the umpire, does not comply within one minute.

The pitcher faces the batsman, with both feet square on the ground, neither of which shall be raised from the ground except when in the act of delivering the ball, nor shall he take more than one step in such delivery. Balks by the pitcher are defined as,—(*a*) any motion made to deliver the ball to the bat without so delivering it; (*b*) any delivery of the ball to the bat while his pivot-foot is not in contact with the pitcher's plate; (*c*) any motion in delivering the ball to the bat while not in the position described in the rule; (*d*) holding the ball so long as to delay the game unnecessarily.

The batter takes his position within the lines herein referred to as the batsman's lines; and while there, no other player of his side shall occupy any of the space.

A "fair hit" is a batted ball that first touches or falls within the foul-lines, or bounds or rolls within the same between home and first or home and third bases.

A "foul hit" is a batted ball the reverse of the above, or one that strikes the person of the batsman while standing in his position. A foul hit that does not rise above the batsman's head, and is caught by the catcher when playing within ten feet of home-base, is called a "foul tip."

If the grounds are surrounded by a fence, a fair-batted ball that goes over the same shall entitle the batsman to a home-run, unless it goes over the fence at a less distance than 235 feet from the home-base, when he shall be entitled to two bases only, and a distinctive line should be marked on the fence at this point.

"Strikes" are defined to be,—(*a*) failure to hit a ball struck at; (*b*) failure to strike at a fairly delivered ball; (*c*) an obvious attempt to make a foul hit; (*d*) making a foul hit while attempting a bunt; (*e*) when any part of the batsman's person is touched by a ball struck at; (*f*) when a ball tipped by the batsman is caught by the catcher within the ten-foot lines.

The batsman is out,—(*a*) when failing to take proper position; (*b*) when failing to take position for one minute after being called by the umpire; (*c*) when the ball is properly caught after a foul hit; (*d*) when making a foul strike; (*e*) when obstructing a player; (*f*) when three strikes are called when first base is occupied, except when two men are already out; (*g*) when he attempts to make a foul hit when two strikes have been called; (*h*) if the ball touches his person when attempting a third strike; (*i*) if he hits a fly ball that can be handled by an infielder while first or second bases are occupied, or first, second and third with only one out; (*j*) if the third strike is a foul hit.

The batsman becomes a base-runner,—(*a*) instantly after he makes a fair hit; (*b*) instantly after four balls have been called; (*c*) instantly after three strikes have been decided; (*d*) if, when not attempting to strike, his person (excepting hands or forearm) or his clothing be accidentally hit by a ball from a pitcher; (*e*) instantly after the illegal delivery of a ball by the pitcher.

The base-runner must touch each base in regular order, and when obliged to return, except on a foul hit, must retouch the base or bases in reverse order.

The base-runner is entitled to take a base,—(*a*) when a succeeding batsman is awarded first base, thus forcing the runner up; (*b*) on a balk; (*c*) when a ball delivered by the pitcher passes the catcher and touches the umpire, or any fence or building within 90 feet of the home-base; (*d*) if a fairly hit ball strikes the person or clothing of the umpire on fair ground; (*e*) if prevented from making a base by the obstruction of an adversary; (*f*) if the fielder catch or stop a ball with his hat or any part of his dress.

The base-runner shall and may return to his base,—(*a*) on a foul tip or a foul hit not caught; (*b*) on a foul strike; (*c*) on a declaration of dead ball, unless it be the fourth unfair ball and forces him up; (*d*) if the catcher be interfered with by the person or clothing of the umpire; (*e*) if he be struck by a ball thrown by the catcher to intercept a base-runner; (*f*) if the ball touch any part of the person of the batsman when attempting a strike.

The base-runner is out,—(*a*) when the catcher, failing to catch the third-strike ball, is hindered by him from fielding the same; (*b*) when legally caught out after making a fair hit; (*c*) if the third-strike ball be legally caught; (*d*) when touched by the ball by a fielder before reaching first base, after either three strikes or a fair hit; (*e*) if, after three strikes or a fair hit, the ball be held by a fielder while touching first base before he reaches the same; (*f*) if he runs outside of the three-foot line while the ball is being fielded to first, unless to avoid a fielder attempting to field a batted ball; (*g*) if, after leaving first base, he shall unnecessarily run more than three feet from a direct line between the bases to avoid being put out; (*h*) if he illegally obstructs a fielder or interferes with a thrown ball; (*i*) if touched with the ball by a fielder when not on a base, excepting that he may overrun first base, but must at once return and retouch it unless he continue on to second, in which event he forfeits the protection against being touched out; (*j*) if a legally caught fair or foul hit ball is held by a fielder, before the ball be again delivered to the bat, on the base he occupied before the ball was struck, or if he be touched with the ball by a fielder before he shall return to said base; (*k*) by being forced off his base by a succeeding player, in which case the ball may be held at the base to which he should go, or he may be touched with it on the base he occupies; (*l*) if struck by a fair-hit ball before it touches a fielder, in which case no base shall be run unless the batsman, by becoming a base-runner, shall force the same, and no run shall be scored or any other base-runner be put out; (*m*) if he fail to touch all intervening bases when running to a base or returning, and is either touched by the ball in the hands of a fielder, or the ball held on the omitted base, provided the ball has not been put into play; (*n*) if, after play is resumed after an intermission, he fails to return to and touch the base he occupied when time was called, provided the ball has

not been put into play before he be touched by the ball or it be held on the base he should so touch.

A run shall be scored whenever a base-runner has made the circuit of the bases legally before three men are out, unless the third man be forced out or is put out before reaching first base.

Not more than two coachers are allowed to a side, who direct the base-runner only. Their conduct is governed by the rules, and their control is in the hands of the umpire.

The umpire is master of the field from the beginning of the game to its termination; he is entitled to the highest degree of respect from both players and spectators, and his decisions are not to be called into question, except that the captains of the competing teams may interrogate him on an interpretation of the rules.

Elaborate rules are provided for scoring, to the end that a full record of each individual player may be kept, as well as for the uniformity in all scores.

The summary of the game as it is now played contains,—

1. The number of earned runs made by each side.
2. The number of two-base hits made by each player.
3. The number of three-base hits made by each player.
4. The number of home-runs made by each player.
5. The number of bases stolen by each player.
6. The number of double and triple plays made by each side, and the names of the players assisting in the same.
7. The number of men given bases on called balls by each pitcher.
8. The number of men given bases by being hit by pitched balls.
9. The number of men struck out.
10. The number of passed balls by each catcher.
11. The number of wild pitches by each pitcher.
12. The time of game.
13. The name of the umpire.

A. G. SPALDING.

BASEDOW'S DISEASE, exophthalmic goiter. See GOITRE, Vol. X, p. 740.

BASELLA is a tropical genus of herbaceous climbing plants belonging to the *Chenopodiaceæ*, and used as pot-herbs in the East Indies. The perianth is fleshy, enveloping the nut, and the cotyledons very much rolled together. Certain species (*B. alba* and *B. rubra*) are cultivated in France as substitutes for spinach.

BASHAHR, one of the Punjab hill states, on the lower slopes of the Himalayas. The province has an area of 3,320 square miles, and its rajahs are tributary to the British. The River Sutlej flows through it from east to west. The people are of the Hindu race.

BASHAW (Turkish, *basch;* Arabic, *basha;* Persian, *pasha*), the way in which the word is now generally written, signifies head, or master; a Turkish title of honor, formerly confined to princes of the blood-royal, but now given to viceroys, provincial governors and naval and military commanders. There used to be three grades, and they were distinguished by the number of horsetails—three, two or one—on the standards which were borne before those entitled to the dignity. The term *bashaw* is also used to characterize a man of an arrogant and domineering disposition.

BASHEE OR BASHI ISLANDS, a small cluster in the line between Luzon, the chief of the Philippine chain, and Formosa, in lat. 21° N. and long. 122° E. They are a dependency of the Philippines, having been colonized by the Spaniards in 1783, and they form a link in the vast archipelago which, from Formosa to Sumatra, inclusive, connects the southeast of China with the west of Malacca. They were discovered in 1687 by Dampier, who called them Bashi Islands on account of the popularity among the islanders of an intoxicating liquor of that name. The inhabitants subsist upon the yams and batatas, which they raise.

BASHI-BAZOUKS, irregular troopers in the pay of the Sultan. See ARMY, Vol. II, p. 618.

BASHKIRTSEFF, MARIE, a Russian authoress and artist; born at Gawronzi, in Pultowa, Nov. 11, 1860, of a family of wealth and rank. She exhibited an abnormally precocious development of mind, and at an early age was an accomplished linguist. At ten years of age she visited Germany and Switzerland, and three years later, Nice, where she began to compose her *Journal*, to which she continued to devote herself until two weeks before her death, in Paris, Oct. 31, 1884. This work she did not at first intend for publication, but after her removal to Paris in 1878, and her becoming associated there with the celebrities of the day, she altered her mind, and began to write her impressions, with the object of eventual publication in view. She had dreams of fame, and masterfully sought her special forte. She became imbued with an enthusiasm for art and entered the atelier of Rudolphe Julian. Two years later she exhibited at the Salon and continued to exhibit there until her death. She made the friendship of Bastien Lepage, which was pathetic in its nature, as they both died within a short time of each other, and of the same malady. In her art she adopted the style of the latter, and became most realistic, which feature is conspicuous in *The Meeting*, which represents a group of Paris gamins. Her *Journal* was edited by André Theuriet, and appeared two years after she died. It is remarkable for its candor and morbid analysis of moods and characters, and leaves a painful impression of the exploitation of a gifted girl's ambitions.

BASIDIOMYCETES, a name applied to the highest group of fungi, and containing the well-known mushrooms, toadstools and puff-balls. Taking the common mushroom (*Agaricus*) as a type, the plant-body is a web (mycelium) of branching filaments growing in the substratum (soil, decaying wood, etc.). Arising from this mycelium is the relatively very large reproductive structure commonly called the "mushroom," which is likewise woven of more or less modified filaments. It is composed of a stalk bearing an umbrella-like disk, from beneath which there hang the radiating gills (lamellæ). When the filaments composing each lamella reach its surface, they each end in a peculiar elongated club-shaped terminal cell, from which the spores are de-

veloped. These club-shaped terminal cells are the basidia (singular, basidium), and are so characteristic of the whole group as to give name to it, the word *basidiomycete* meaning literally a "basidium-fungus." See FUNGUS, Vol. IX, pp. 832, 833.

BASIL, a name given to several species of the family *Labiatæ*, especially of the genus *Ocyonum*. The most commonly cultivated species are natives of the oriental tropics, or of the warmer temperate latitudes, and are characterized by a pleasant aromatic smell and taste. Cultivated for culinary purposes, being used as seasoning.

BASILEAN MANUSCRIPT, the name given to two Greek manuscripts of the New Testament. One is a nearly complete copy of the Gospels, written at Constantinople, in uncial character, about the eighth century, lacking only Luke iii, 4–15, xxiv, 47–53; the other a copy of the whole New Testament, excepting the Apocalypse, which is written in the cursive character of the tenth century. These valuable manuscripts are preserved in the library at Basel; hence their name.

BASILIAN ORDER, a body of professed religions in the Greek and Latin churches that follow the rule of St. Basil the Great. (See BASIL, Vol. III, p. 412.) His sister, Macrina, had established a convent in a wilderness of Pontus, and thither St. Basil went for repose, probably in A.D. 358, and here he established a monastery and gave it a written rule which won the early approval of several popes. It spread rapidly in the East and in Italy. Under the iconoclast emperor, Constantine V, it suffered severe persecution. The order exists in Russia and Armenia, and these branches are considered schismatic by those who adhere to the see of Rome. The latter in Russia are under an archimandrite, but follow the Greek rite and use Slavic speech in saying the offices of their ritual. The monks having become degenerate, their order was reformed in the sixteenth century by Pope Gregory XIII. The order exists in Austria, Spain, Italy and elsewhere; its members are mostly laymen, and wear abroad a black cowl and cassock. They join labor to abstinences. The Empress Irene established a convent for nuns in Constantinople in the twelfth century. The nuns are divided into observers of both Greek and Latin rites, and are found in Russia, Poland and Italy. The Armenian Basilian religious are lax observers of the rule, abound chiefly in the cities of the East and have monasteries in Jerusalem.

BASILICON OR BASILICUM, a name given to an ointment composed of yellow wax, 2 parts; black pitch, 5 parts; resin and olive-oil, 8 parts. These materials are melted together over a slow fire, and the mixture, while hot, is strained through linen. Basilicon ointment is used as a gently stimulant application to blistered surfaces, indolent ulcers, burns, scalds and chilblains.

BASILICON DORON, a celebrated prose work of King James VI of Scotland, written for the instruction of his son, Prince Henry. It consists of three books. The first treats *Of a King's Christian Duty Toward God;* the second, *Of a King's Duty in His Office;* and the third, *Of a King's Behavior in Indifferent Things.* It was first published in 1599. It has been translated into Latin and French, and is now considered a literary curiosity, but at first its extreme views of the divine right of sovereigns aroused public suspicion and dislike.

BASILIO DA GAMA, José, a Brazilian poet, born at San José do Rio, 1740. He went to Rome, where he studied, becoming a member of the Roman Arcadia; thence he went to Lisbon, where he became a friend of the Portuguese statesman, Pombal. He returned to Brazil in 1777, and was a member of the Jesuit College when it was driven from that country. He again returned to Lisbon, where he died, July 31, 1795. His principal poem was *Uruguay*, an epic dealing with events of the revolt, incited by the Jesuits in 1756, among the natives of Paraguay. He also published *Quitubia* and *Cantico aos Campos Elysios.*

BASILISCUS, an emperor of the East, who died about A.D. 477. He was a brother of Verina, the wife of Leo I. The latter sent him with an armed force against the Vandal Genseric, who defeated him. In the year 474 he endeavored to usurp the throne of the east, but he was overcome by Zeno.

BASIM OR BASSIM, a town of India, situated in a very populous and fertile district of the province of Berar. It is 413 miles N.E. of Bombay. Population, about 8,531.

BASIN, a descriptive term applied, in geography, to a collection of water; as, a sea, a bay, a lake or a river. In physical geography it is especially applied to a circular or oval valley, either forming the bed of a lake or having a river running through it; it also refers to the entire area drained by a river system. In geology the term is applied to a formation in which the strata dip on all sides toward one center; or to a depression in strata which has been filled in by later deposits. Professor Ramsay advanced the theory that geological basins have been scooped out by glacial action.

BASING, BARON. See SCLATER-BOOTH, GEORGE, in these Supplements.

BASKING-SHARK, the popular name given to a species of shark (*Selache maxima*), on account of its fondness for reposing on the surface of the water in the sun. Bone-shark, sailfish, sunfish, or hoe-mother are other vernacular names for this fish. Several barrels of oil are sometimes obtained from the liver of a single shark of this species. See SHARK, Vol. XXI, p. 777.

BASQUES, a people of uncertain descent, inhabiting the western Pyrenees. See BASQUE PROVINCES, Vol. III, pp. 423,424; IBERIA, Vol. XII, p. 605.

BASRA, BASSORAH, BALSORA OR BUSSORAH, a town of Asiatic Turkey. See BUSSORAH, Vol. IV, p. 577.

BAS-RELIEF OR BASSO-RELIEVO. See SCULPTURE, Vol. XXI, p. 571.

BASSADORE OR BASIDU, an abandoned station on the Persian Gulf for British ships; situated at the southwestern end of the island of Kishm. Climate very unhealthy.

BASSARIS, a genus of animals composing the North American family *Bassaridæ;* closely

related to the raccoons. The civet-cat (*B. astuta*) is found in the Southwestern United States and Mexico. Its habits are arboreal. It is often tamed.

BASS OR BASSWOOD (corruption of the Danish and German word *bast*, meaning inner bark), the linden or lime tree (*Tilia Americana*), common in the United States. Its leaves are serrate and nearly heart-shaped; it bears a woody, one-celled nut, and its blossoms furnish abundant honey for bees. The wood is soft and light, of little use for fuel, but valued for carriage-making. The ornamental basswood or whitewood *Tilia heterophylla*, is common in the Southern and Western parts of the United States, and frequently grows to a great size and height. See LIME OR LINDEN, Vol. XIV, p. 648.

BASS, a popular name applied to many widely different fishes of the perch family. It is particularly applied to the genus *Labrax* and allies. Among the common forms are the striped bass of the Eastern United States (*Roccus lineatus*), the rock-bass (*Ambloplites*), the white bass (*Roccus chrysops*), black bass (*Micropterus*, two species), and many others. The basses are all strong and active, and are highly prized as game-fishes.

BASS, EDGAR W., an American soldier and astronomer, born at Prairie du Chien, Wisconsin, in 1843. After serving as a volunteer against the Sioux Indians, he was appointed a cadet at West Point and graduated there in 1862, when he was made lieutenant of engineers. He devoted himself to scientific work, and was twice instructor in physics at the Military Academy, and in 1878, resigning his lieutenancy, he accepted the professorship of mathematics at the same place. In 1875 he was an assistant observer of the transit of Venus. He published an *Introduction to the Calculus* and *Differential Calculus*.

BASS, MICHAEL THOMAS (1799–1884), an English brewer. He was a Liberal in politics, and was returned to Parliament for Derby in 1847, which he represented continuously for 35 years, when he retired. He was a great benefactor to the towns of Burton and Derby. His eldest son, Michael Arthur, had a baronetcy conferred upon him, and was promoted to the peerage in 1886 as Baron Burton. For an account of his immense brewery, see BURTON-ON-TRENT, Vol. IV, p. 572.

BASSAS, two ledges of rocks to the southeast of Ceylon, distinguished as GREAT and LITTLE, the former group being more to the southwest, the latter more to the northeast. Upon both are lighthouses. Their importance arises from their position, which is in a great thoroughfare of traffic.

BASSET-HORN (It. *corno di basetto*), the richest and softest of all wind-instruments. See OBOE, Vol. XVII, p. 708.

BASSETT, JAMES, an American missionary and author; born near Hamilton, Ontario, Jan. 31, 1834. He was graduated at Wabash College, Crawfordsville, Indiana, in 1856, and at Lane Theological Seminary in 1859, and served as chaplain in the volunteer army on the outbreak of the Civil War. After filling several Presbyterian charges he became a missionary, and traveled extensively in Turkey and in Persia, being the first American to settle in Teheran. Among his works are *Hymns in Persian*, published at Teheran in 1875 and in 1884; *Among the Turcomans* (1879–80); *Persia, the Land of the Imâns* (1886); and also a translation of the Gospel of Matthew into the Tatar language.

BASSIA, a genus of trees of the family *Sapotaceæ*, found in the East Indies and Africa. The flowers are remarkable for their fleshy corolla, and for the abundance of oil or butyraceous fat which the seeds contain, and which is used for many purposes by the inhabitants of the countries in which they are indigenous. The fruit has a pulpy rind, and three or four one-seeded cells; the ovary has eight cells, but some of them are always abortive. *Vitellaria Lucuma* is highly valued, and forms an important article of internal commerce in the interior of Africa. The seeds of the fruit are dried in the sun or in an oven, and the kernels are boiled in water, in order to obtain the butter from them, which not only keeps a whole year without salt, but is whiter, more solid and more pleasant to the taste than the butter of cow's milk. It is used both as an article of food and medicine.

BASSOMPIERRE, FRANÇOIS, BARON DE, born at Château d'Harovel, Lorraine, in 1579. Belonging to one of the oldest French families, he came at the age of 20 to the French court, where he gained the favor of Henry IV. After the murder of the king he was appointed colonel of the Swiss Guards. In 1622 he was raised to the rank of marshal of France, and took the pass of Suza by storm in 1629. He became an object of suspicion and dislike to Richelieu, who caused him to be cast into the Bastile in 1631, where he remained 12 years. His *Mémoires* (1665) were written in the Bastile, and are rendered interesting by their spirited style. He died Oct. 12, 1646.

BASSORA GUM OR BUSSORAH GUM. See GUM, Vol. XI, p. 276.

BAST OR PHLŒUM, the inner bark of the stems of exogenous plants or trees. For its characteristic structure, see HISTOLOGY, Vol. XII, p. 18; also LIME, Vol. XIV, p. 648.

BASTARDY is the offense of begetting an illegitimate or bastard child. Throughout the United States an action may be maintained by the mother of a bastard child for the purpose of establishing the identity of the father and requiring him to contribute, according to his means, to the support of the child. These actions are governed by the state statutes, and in many states the father will be imprisoned upon his failure to support the child. At common law a bastard was not permitted to take property by inheritance, but in most of the United States, by statute, he may inherit both real and personal property from his mother. See BASTARD, Vol. III, pp. 426–428.

BASTIAN, ADOLF, German traveler and anthropologist; born at Bremen, June 26, 1826. He pursued his studies at Berlin, Heidelberg, Prague,

Jena and Würzburg. In 1851 he sailed to Australia as ship's doctor, after which he visited North and South America, Europe, Asia and Africa, collecting, in the mean time, a wonderful store of information concerning the ethnology of the countries he visited, and which, on account of the scientific accuracy of the observer, have proved an invaluable mine, and from which he drew the chief facts of his important works. He made his residence in Berlin, where he produced 30 books on ethnology and kindred subjects, in which he is inclined to support orthodox views of creation. Among his works are *Der Mensch in der Geschichte; Die Völker des östlichen Asien; Religions-Philosophische Probleme;* and *Der Fetische an der Küste Guineas.* He edits *Zeitschrift für Ethnologie*, a scientific serial, published in Berlin.

BASTIAN, Henry Charlton, English physiologist; born at Truro, Cornwall, April 26, 1837. He was educated at Falmouth and the University College in London, where he became successively professor of pathological anatomy, hospital surgeon and professor of clinical medicine. He was dean of the medical faculty of University College (1874–76). He championed the spontaneous generation theory. Among his works are *Modes of Origin of Lowest Organisms* (1871); *Beginnings of Life* (1872); *Evolution* (1874); and *The Brain as an Organ of Mind* (1880); *Paralysis* (1886).

BASTIDE, Jules, a French journalist and politician; born in Paris, Nov. 22, 1800. He was a member of the constituent assembly. In 1821 he became one of the first members of the French Carbonari; in 1832 was condemned to death, but escaped to London; was pardoned in 1834, and returned to Paris. In 1847 he founded the *Revue Nationale.* During 1848 he was minister of foreign affairs. He died March 3, 1879.

BASTIEN-LEPAGE, Jules, a French painter; born at Damvillers, Nov. 1, 1848; died in Paris, Dec. 10, 1884. Though born in humble circumstances, he was destined for the civil service, and was educated at Verdun, where he graduated in 1866. He early developed a talent for drawing. He secured a position in the postal department in Paris in 1867, but in a short time he gave this up, and devoted his whole time to the study of art, entering the studio of Cabanel. During the Franco-Prussian war he was wounded. After the war he resumed his work, and became popular among the younger artists on account of his faithful portrayal of nature. In 1874 he exhibited his *Song of Spring* and another work, both of which received medals. He aroused enthusiasm in 1878 with *The Hay*, and in 1879 with *The Potato-Gatherers.* His great work is *Joan of Arc*, exhibited in 1880, imaginative as well as realistic, now in the Metropolitan Art Museum, N.Y. After this he returned to a simpler style. He was best as a portrait-painter, his picture of his mother, exhibited in 1889, being a masterpiece. He was a victim of consumption dying soon after his friend Marie Bashkirtseff; q.v., in these Supplements.

BASTION (formerly called bulwark), in fortification, an earth-work or projecting tower, built usually at the corner of a wall surrounding a city. See Fortification, Vol. IX, pp. 443, 461.

BASTROP, capital of Morehouse parish, northeastern Louisiana, 26 miles N.E. of Rayville, on the New Orleans and Northwestern railroad. It has a college. Population 1895, 1,000.

BASTROP, capital of Bastrop County, southeastern Texas, on the left bank of the Colorado River, and 40 miles N.W. of La Grange, on the Missouri, Kansas and Texas railroad. Cotton is shipped from here by boat to Austin. Population 1890, 1,634.

BASUTOLAND, a British crown protectorate in South Africa, adjoining Cape Colony on the northeast. Area, 10,293 square miles. Population in 1891 (estimated), 218,900, of which 578 were whites; in 1895 (estimated), 250,000. European settlement is prohibited. The capital, Maseru, has a population of 862, of whom 99 are Europeans. The productions are wool, wheat, mealies, and Kaffir corn. There are indications of iron and copper, and coal has been found and is used in some parts, two mines being actively worked for local supply. Basutoland was annexed to the Cape in August, 1871, but it was placed directly under the authority of the crown, March 13, 1884. The territory is now governed by a resident commissioner, under the direction of the high commissioner for South Africa, the latter possessing legislative authority, which is exercised by proclamation. There are 144 schools, chiefly missionary, with 7,543 scholars, the schools receiving a government grant of $8,995. There are no navigable waterways, but the roads are good, the postal and telegraph communication being through Cape Colony and the Orange Free State. The revenue in 1894 was $223,135; expenditures, $215,320; exports, $417,035; and imports, $343,370.

The natives, called Basutos, are of the Bantu stock, and allied to the Bechuanas, all of which are included under the general denomination of Kaffirs. The Basutos are a superior and warlike race. They became independent from other tribes about 1800. Their second king, Moshesh, fought both the Boers and the British, but had to yield to the latter in 1860, since which the tribe has settled down into peaceable submission. The Basuto country is well watered, and possesses a fine climate, the abundant grasses enabling the natives to raise great herds of cattle, which has been their great industry. See Africa, in these Supplements.

BASYLE, a name formerly given to a substance that can unite with oxygen to produce a base. Thus all the metals are examples of basyles, and ammonium, ethylemethyle, etc., represent compound basyles. The term now in use is radical, or compound radical.

BATANGAS, a seaport town of the Philippines, in the southwest of the island of Luzon, and capital of the province of the same name, 50 miles south of Manila. It was founded in 1581, and is well built; has an elegant appearance, being finely situated on an extensive bay, which opens into the Strait of Mindoro. Considerable advantage

is taken of its facilities for commerce. Population 1887, 35,587.

BATATAS OR SWEET POTATO. See POTATO, Vol. XIX, p. 597.

BATAVI (sometimes written *Vatavi*), a German race that anciently lived in a part of Holland, on or near the island Batavia, which lies between a branch of the Rhine, the Waal River and Meuse River. The appellation survived in the name, *Batavian Republic*, applied to the Netherlands from 1795 to 1806. See HOLLAND, Vol. XII, p. 69.

BATAVIA, a town in Kane County, northeastern Illinois, on the Fox River, 7 miles N. of Aurora, and 36 miles W. of Chicago, on the Chicago and Burlington and the Chicago and North-Western railroads. It contains a private asylum for the insane, known as Bellevue Place, and extensive manufactories of machinery, windmills and paper. Population 1890, 3,543.

BATAVIA, capital of Genesee County, a town of western New York, on the Tonawanda Creek, 32 miles N.W. of Rochester, on the Lehigh Valley and New York and Hudson River railroads. It has a state institution for the blind, a convent, an arsenal, and manufactories of plows, sashes and blinds, guns, carriage-wheels, shoes and agricultural implements. Population 1890, 7,221.

BATAVIA, capital of Clermont County, southwestern Ohio, on the east fork of the Little Miami River, 24 miles E. of Cincinnati, on the Cincinnati, Portsmouth and Virginia railroad. It manufactures carriages and pressed brick. Population of township in 1890 was 3,502, of which a fourth resided in the village.

BATCHIAN OR BATJAN, an island of the Dutch East Indies, in the Molucca or Spice Islands group. Its area is about 900 square miles; the country is mountainous and fertile. Among the productions are gold, copper, garnets, rice and cloves. Coal, similar to the English carboniferous measures, underlies the surface.

BATEMAN, NEWTON, an American educator; born at Fairfield, New Jersey, July 22, 1822. He removed with his parents to Illinois in 1833 and 10 years later graduated at Illinois College, Jacksonville. After studying at Lane Theological Seminary for a time and traveling in various parts of the United States, he became principal of a school in St. Louis, and in 1851 principal of the free public school at Jacksonville, Illinois. In 1878 he was chosen principal of the Jacksonville Female Academy, and the same year state superintendent of public instruction, serving altogether 10 years in the latter capacity. He took an active part in establishing the State Normal University; and from 1875 to 1892 was president of Knox College, Galesburg, Illinois. He was a member of the state board of health from 1877, serving three terms. His annual reports as superintendent of public instruction are valuable; besides these reports, he published *School Laws of Illinois as Amended 1865*, which reached a twelfth edition within a year; and *School Laws and Common School Decisions of the State of Illinois*, revised by W. L. Pillsbury (1888). He died Oct. 22, 1897.

BATENBURG, a town of the Netherlands, in the province of Gelderland, situated on the right bank of the Maase, nine miles W. of Nymegen. Its population is about 980, and it is noteworthy on account of its association with the Romans, whose Oppidum Batavorum it was.

BATES, ARLO, an American author; born at East Machias, Maine, Dec. 16, 1850, and graduated at Bowdoin College in 1876. He removed to Boston, becoming secretary of the Young Men's Republican Committee and editor of a civil service reform organ, the *Broadside*. In 1880 he became editor of the Boston *Courier*. He published the following, among other works: *Patty's Perversities* (1881); *Mr. Jacobs*, a parody on Marion Crawford's *Mr. Isaacs* (1883); *The Pagans* (1884); *A Wheel of Fire* (1885); *Berries of the Brier*, poems (1886); *Lad's Love* (1887); *Oriental Tales; Sonnets in Shadow* (1887); and *The Philistines* (1888).

BATES, EDWARD, born in Belmont, Goochland County, Virginia, Sept. 4, 1793. After receiving his education he intended to go to sea, but was prevented. He served in the Virginia militia in 1813, and then went to Missouri, where he practiced law. He was made prosecuting attorney for the St. Louis circuit, and then attorney-general of Missouri. In 1822 he was sent to the legislature. In 1850, after having devoted about 25 years to the profession of law, he was offered the position of Secretary of War by President Fillmore, but declined. At the national Republican convention where Lincoln was nominated for the Presidency, Mr. Bates's name received many votes. After Mr. Lincoln's election he chose Mr. Bates for Attorney-General, which office he resigned in 1864. He died in St. Louis, Missouri, March 25, 1869.

BATES, JOSHUA; born at Weymouth, Massachusetts, in 1788. He early showed great business aptitude, and at 15 entered the counting-house of William Gray and Son, of Boston. In 1812 he was sent by them to Europe. In 1828 John Baring and himself were taken into the firm of Baring Brothers and Company. When difficulties arose between the United States and England with reference to the War of 1812, Mr. Bates was chosen umpire (1854), and his decisions gave entire satisfaction. The same year he gave $50,000 to the city of Boston to provide for a public library, his name being perpetuated in connection therewith by Bates Hall. He afterwards presented the library with 30,000 volumes. He died in London, Sept. 24, 1864.

BATES, SAMUEL PENNIMAN, born at Mendon, Massachusetts, Jan. 29, 1827. He graduated at Brown University, and then spent several years in teaching in Meadville, Pennsylvania. His lectures to teachers occasioned the founding of the first normal schools in that section of the state. In 1857 he was called to Pennsylvania as superintendent of schools in Crawford County. In 1860 he became deputy state superintendent of schools, and in 1866 state historian of Pennsylvania. His writings are mostly on educational subjects. He has published *Lectures on Mental and Moral Culture* (1859); *Battle of Gettysburg*

(1878); *Battle of Chancellorsville* (1882); and other historical works.

BATESVILLE, capital of Independence County, north-central Arkansas, pleasantly situated on the north bank of the White River, on the St. Louis, Iron Mountain and Southern railroad, about 90 miles N. of Little Rock. It contains several flouring and woolen mills, and manufactures furniture. It is the seat of Arkansas College, a Presbyterian institution founded in 1872, Batesville Academy and Soulesbury Institute. Population 1890, 2,150.

BATH, a city of Sagadahoc County, southern Maine, on the Maine Central railroad. Its situation has given it its importance as a shipping-point, navigation being possible all the year, as the river seldom freezes there in winter. The town is built on uneven ground and slopes toward the east, extending for about two and a half miles along the river, and about one mile behind. It has extensive factories, producing articles and furnishings required for the shipping industry. Population 1890, 8,723. See BATH, Vol. III, p. 434.

BATH, capital of Steuben County, southwestern New York, situated on the Cohocton Creek, 36 miles W. of Elmira, at the railroad junction of the New York, Lake Erie and Western, and the Delaware, Lackawanna and Western railroads. It has miscellaneous factories, an orphan asylum, and the New York State Soldiers' Home. Population 1890, 3,261.

BATH OR BERKELEY SPRINGS, capital of Morgan County, northeastern West Virginia, 7 miles south of Hancock station, on the Baltimore and Ohio railroad, with which it is connected by a branch. The mineral springs have a temperature of 74° F. Population 1895, 800.

BATH COURTHOUSE OR WARM SPRINGS, capital of Bath County, western Virginia, noted as a summer resort, is among the Alleghany Mountains, about 65 miles N. of Lynchburg. The mineral springs, which are the attraction here, have a constant temperature of about 78° F.

BATHORI, ELISABETH, a monster of cruelty born in the latter part of the sixteenth century; she was the niece of Stephen Bathori, king of Poland, and the wife of Count Nadasdy of Hungary. She employed agents to kidnap young girls and women, whom she murdered in a diabolical manner, for the purpose of securing a continuous supply of their blood in which she might bathe, believing this was a sure method of securing perpetual beauty. Official investigation in 1610 convicted her of having put to death in this manner 650 victims. Her agents were beheaded or burned alive, but she escaped with confinement to her fortress of Csej, where she died in 1614.

BATH STONE, a building-stone extensively used in England. See BUILDING, Vol. IV, p. 469.

BATHYBIUS, a name given by Huxley to the slimy masses of matter found at the bottom of the sea, and which he supposed to consist of the simplest form of living or organized matter, from which all higher forms were derived. This was a view which was soon abandoned, and now its animal nature is doubted, the matter being regarded as simply the depositions of the calcium salts of the water. See ANATOMY, Vol. I, p. 843.

BATHYMETRY, the art of measuring depths at sea. The greatest depth yet found in the ocean is 4,575 fathoms. An account of the apparatus and methods used in making such measurements is given at SOUNDING, Vol. XXII, pp. 280, 281. An ingenious and delicate device was invented by C. W. Siemens for determining the depth of water under a boat or ship without sounding, and it is called a *bathymeter* or *bathometer*. It depends on the difference of densities of sea water and the solid earth, which are as 1.026 to 2.75 to each other. In other words, the attraction of gravitation exerted upon a floating object is less when there is a great depth of water under it than would be if the same space were filled with rock or solid earth. This difference is appreciable, and can be determined by an apparatus sufficiently delicate. The Siemens bathometer consists of a tube filled with mercury; the column of mercury rests upon a metal plate or diaphragm adjusted and kept in place by steel springs. The shallower the water, the greater is the tension of the springs; and the deeper, the less is that tension. The movement of the springs is magnified and read by a micrometer-screw, and the apparatus is so delicate that it is claimed that variations of depth can be indicated to a fathom.

BATISTE, a fine texture of cotton, thought to have derived its name either from its original maker, Baptiste, or from its use in drying the foreheads of children after baptism.

BATLEY, a manufacturing town of the West Riding, Yorkshire. It has 50 mills and factories, where are manufactured different kinds of heavy woolen cloth, such as army-cloth, druggets, etc. The city has a town hall, over 30 churches, a chamber of commerce, a mechanics' institute and a market-place. Population 1881, 27,514, 1891, 28,719.

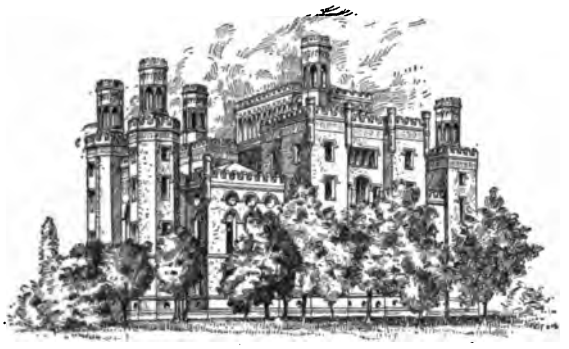
BAT MALTHÆA (*Malthæa vespertilio*), a fish of the Atlantic, remarkable for its grotesque shape. The name refers to some fancied resemblance to a bat.

BATMAN, the soldier-servant of an English army officer. In the British army, field-officers are allowed a body-servant, as well as a groom for their horse. During active service the batman takes his place in the ranks. In the United States Army the slang term "dog-robber" is applied to soldier-servants.

BATN-EL-HAGAR, a stony district in Nubia, along the Nile, in lat. 21°–22° N., and long. 30° 40′–31° 10′ E. The Nile, in the upper portion of the district is often forced by approaching rocks into a very narrow channel, and its navigation is frequently interrupted by small islands, rocks and cataracts. The district is peopled by Arabs.

BATON ROUGE, a city and capital of Louisiana and of East Baton Rouge Parish, on the east bank of the river, 130 miles by river and 89 by rail above New Orleans. From 1847 to 1864 it was the state capital, when it gave place to

New Orleans, and again became the state capital in 1882. The situation, on a bluff 25 feet above the highest water-mark, affords a fine view of the river and surrounding country. The district is exceedingly fertile, yielding abundant crops of cotton, sugar, Indian corn, sweet potatoes, etc. The city has a state penitentiary, barracks, military hospital, asylums for the deaf and dumb and blind, and the State Uni-



CAPITOL, BATON ROUGE, LOUISIANA.

versity, moved from Alexandria. On the 5th of August, 1862, General Breckinridge attacked the Union army here and was repulsed, the Union commander, General Thomas Williams, defending the city, being killed in the action. Population 1880, 7,197; 1890, 10,478. See BATON ROUGE, Vol. III, p. 442.

BATRACHIA, a name nearly synonymous with *Amphibia* in Cuvier's system, including salamanders, frogs and toads. It is now restricted to the tailless forms, the frogs and toads, and is equivalent to *Anura*.

BATRACHOMYOMACHIA (*The Battle of the Frogs and Mice*), a Greek mock-heroic poem in hexameters, of which 316 lines are extant, erroneously ascribed to Homer, with whose works it has been generally printed. Pigres of Caria, who lived in the times of the Persian wars, was named among the ancients as its author. It is a parody on the *Iliad*, in which the military preparations and contests of beasts, with single combats, intervention of the gods, and other Homeric circumstances, are described with much humor and palpable inconsistencies, such as the coming to life of combatants already killed. The mice, at first gaining on the frogs, are finally defeated by the latter on the appearance, to their assistance, of the crabs.

BATSHIAN, one of the Moluccas, lying southwest of Gilolo. It belongs to the Dutch, who in 1610 took it from Spain, or rather from Portugal, then a portion of the Spanish monarchy. Its area is from 800 to 900 square miles. It is almost intersected by the equator, being only 35′ S., with a long. of 127° 35′ E. It produces large sago and cocoa palms, rice, and the best cloves in the Moluccas. Its chief town, Batshian, near the center of the island, has a population of over 1,000.

BATTA, an allowance to the British army in India, in addition to the ordinary pay of officers. The pay is fixed, but the batta varies according to the part of the country in which the troops are placed, and also depends upon the circumstances of their being in the field or in cantonments. If in the field, or more than 200 miles from the presidential government, the officers receive full batta; if in garrison within that distance, half-batta.

BATTENBERG, HENRY MAURICE, PRINCE OF, was born in Milan, Oct. 5, 1858. He was the son of Prince Alexander of Battenberg, and married, July 23, 1885, at Osborne, Princess Beatrice, the youngest child of Queen Victoria. He was appointed governor of the Isle of Wight, and also of Carisbrooke Castle, created a "Royal Highness" by the Queen. He volunteered for service in the expedition sent in December, 1895, to Coomassie, Ashanti, to reduce King Prempeh to submission; caught the fever crossing the river Prah; was conveyed to Cape Coast Castle, and sailed thence for Madeira, but died on the voyage, Jan. 20, 1896. He left three sons and one daughter.

BATTENS, sawn timber of smaller dimensions than the kind called planks. See BUILDING, Vol. IV, p. 487.

BATTERSEA, an important borough of London, situated on the south bank of the Thames. It is principally inhabited by artisans, and has many manufactories. The flats called Battersea Fields, once famed as a rich botanical station, are now formed into a public park. Adjacent to the park the Thames is crossed by Battersea Bridge, Albert Bridge, Chelsea Bridge and a railroad bridge. Battersea was the birthplace and place of residence of Lord Bolingbroke. Population 1891, 150,458.

BATTERSHALL, JESSE PARK, an American chemist, born at Troy, New York, May 26, 1851. He commenced the study of chemistry at the school of mines, Columbia College, in 1867, and went to Germany in 1869, studying with Wöhler at Göttingen, and with Kolbe at Leipsic, the following year. Visiting Switzerland, he attended the lectures by Marignac at Geneva. On his return to America in 1879, he entered the government service and was put in charge of the analytical department of the United States Laboratory at New York. He translated Alfred Naquet's *Chimie Legale* (1876), and was the author of *Adulteration of Food and Drink* (1886). He died Jan. 12, 1891.

BATTERSON, HERMAN GRISWOLD, an American religious writer; born at Marbledale, Connecticut, May 28, 1827. He was ordained a clergyman of the Episcopal Church in 1861, and was rector successively of St. Mark's, San Antonio, Texas; Grace Church, Wabasha, Minnesota; St. Clement's and the Church of the Annunciation, Philadelphia. His works include *The Missionary Tune-Book* (1868); *Christmas Carols* (1877); *Sketch-Book of the American Episcopate* (1884); *The Pathway of Faith* (1886).

BATTERY, GALVANIC OR VOLTAIC. See ELECTRICITY, Vol. VIII, pp. 92–94.

BATTERY CELLS, PRIMARY AND SECONDARY. See ELECTRICITY, in these Supplemets.

BATTHYANYI, LOUIS, COUNT, a Hungarian

patriot; born in 1806, at Presburg. Appointed to the presidency of the ministry in 1848, he favored a liberal policy, and at the end of six months had to resign. When his friends were defeated in battle by the Austrians he was courtmartialed and unjustly condemned to death. He was shot, Oct. 6, 1849. See HUNGARY, Vol. XII, pp. 372, 373.

BATTLE, WAGER OF. See ORDEAL, Vol. XVII, p. 820.

BATTLE CREEK, a city in Calhoun County, southwest Michigan, on the Kalamazoo River, at the mouth of Battle Creek, and on the Michigan Central and the Chicago and Lake Huron railroads, at the point of their crossing. It is 45 miles S.W. of Lansing, the state capital, 121 miles W. of Detroit, and 163 miles E.N.E. of Chicago. Battle Creek affords great water-power. Here are manufactories of thrashing-machines, hoes, carriages and furniture, knitting-mills and several flour-mills and iron foundries. The city is well supplied with churches, and has an extensive sanatorium. In connection with the sanatorium is carried on the manufacture of "health-foods" on a large scale. Here is the seat of Battle Creek College, founded in 1874, under the patronage of the Seventh-Day Adventists. It had, in 1895, 24 instructors and 670 students. The public school building cost $80,000. Population 1880, 7,063; 1890, 13,090; 1895, 15,522.

BATTLEDORE (probably from the Spanish *batidor*, a beater), the name of an instrument shaped like a small racket, and used in playing battledorr and shuttlecock. This game has been a favorite one in Europe since the fourteenth century.

BATTLEFORD, a town in Saskatchewan, in the Northwest Territories of Canada, on the river of the latter name, at its junction with Battle River. It is a trading-point of importance, and is surrounded by Indian reservations. This place was formerly the capital of the Northwest Territory. It was here and at Batoche that the disturbances in connection with Louis Riel's second rebellion took place.

BATTLEMENT, a notched or indented parapet used in fortification. See ARCHITECTURE, Vol. II, p. 460.

BATTLE-SHIPS. See NAVY, in these Supplements.

BATTUE (Fr. *battre*, "to beat"), a method of killing game, where a large number of hunters get together and shoot hares, rabbits or pheasants as they are driven out of the woods by men who beat the bushes.

BATU KHAN (also written BATOO or BATOU KHAN), grandson of Genghiz Khan, a Mongol leader, so cruel that when he sacked the city of Kozelsk its name was changed to "City of Woe." For an account of his career see MONGOLS, Vol. XVI, pp. 741, 746.

BATURIN, a town in the government of Tchernigov, on the Seim, Russia. It was founded by Stephen Bathory, king of Poland, and was at one time a favorite residence of the hetmans of the Cossacks, of whom Mazeppa, who, in 1708, sold himself to the Swedes, was the most notorious. This place, with its once beautiful grounds, is going rapidly to decay.

BAUDISSIN, WOLF WILHELM FRIEDRICH, GRAF VON, a German Semitic scholar; born at Sophienhof, Prussia, Sept. 26, 1847; became professor at Marburg in 1880, in the theological faculty. He is known principally for his studies in Semitic archæology and religion, publishing two works, the *Study of Semitic Religion* (1876–78) and *An Investigation into the Old Testament Priesthood* (1889).

BAUDOT, JOSEPH EUGENE ANATOLE DE, a French architect; born at Serrebourg, Meurthe, Oct. 14, 1834. He was a student under Labrouste and Viollet-le-Duc, and exhibited at the annual salons a series of architectural subjects, obtaining several medals; was appointed architect for the cathedral of Clermont-Ferrand, and inspector of diocesan edifices; promoted officer of the Legion of Honor in 1889; published *Eglises de Bourgs et de Villages* (1861) and *Le Sculpture Français au Moyen Age et à la Renaissance* (1884); he edited, with M. Viollet-le-Duc, *La Gazette des Architectes*.

BAUDOUIN DE COURTENAY, JEAN, a Polish philologian; born at Radzymin, near Varsovie, in 1845. He pursued his studies at the universities of Varsovie, Prague, Jena and Berlin. He obtained the degree of doctor at Leipsic and also at St. Petersburg; appointed professor of Slavic languages at the University of Kazan; in 1882 occupied the same chair at the University of Dorpat; made comparative studies of the Russian, Polish, German and other kindred tongues. Among his more general works are *Sur la Grammaire Comparée des Langues Indo-Européennes* (1881); *De la Pathologie et Embryologie du Langage* (1886); *Chansons Populaires Polonaises des Environs Varsovie* (1886).

BAUDRILLART, HENRI JOSEPH LÉON, a French political economist and publicist; born in Paris, Nov. 28, 1821. He was appointed to the chair of political economy in the College of France in 1866, and became general inspector of libraries in 1870. See POLITICAL ECONOMY, Vol. XIX, p. 395. His chief works are *Economie Politique* (1857; 2d ed. 1878); *Histoire du Luxe* (1878–80). He was promoted, in 1889, officer of the Legion of Honor.

BAUDRY, PAUL JACQUES AIMÉ, a French painter; born at La Roche-sur-Yon, Nov. 7, 1828. He studied at Paris and Rome, was for 10 years employed in the decorations of the *foyer* of the Grand Opera in Paris, and was elected member of the Académie des Beaux-Arts. Two of his best works are *Assassination of Marat* and *Punishment of a Vestal Virgin*. His *Glorification of the Law* is one of the noted ceiling-decorations in the Palais de Justice in Paris. He died in Paris, Jan. 17, 1886.

BAUER, BRUNO, a German rationalist and biblical critic; born at Eisenberg, Sept. 6, 1809. He was son of a porcelain-painter, and received his education at the University of Berlin, where he was made doctor of theology (1834). He devoted himself to "scientific criticism of the

Bible," becoming a rationalist of the extreme type. He held the professorship of theology at Bonn, but his views were so pronounced that he was forbidden to lecture, and he therefore removed to Berlin. In his work, *Critique of the Epistles of St. Paul*, he endeavors to prove the four leading epistles to be apocryphal. So chimerical were some of his theories, as that Seneca founded Christianity, and so destructive were his methods, that he contributed but little of value to biblical criticism. Among his works are *Criticism of Strauss's Life of Jesus; Journal of Speculative Theology; Critical Exposition of the Religion of the Old Testament; Critique of the Evangelical History of John; The Question of Liberty and My Own Private Affairs;* and *Christianity Unveiled.* For a time he devoted himself to historical writing, publishing a *History of Germany During the French Revolution and the Reign of Napoleon;* and *History of the French Revolution Until the Establishment of the Republic.* He is spoken of as the "Voltaire of Modern Germany." He died at Rixdorf, April 18, 1882.

BAUER, CAROLINE, a German actress; born at Heidelberg, May 28, 1807. At the age of 15 she made her *début* on the stage, and won a brilliant success in both comedy and tragedy. At 22 she consented to a morganatic marriage, under the name of Countess Montgomery, with Prince Leopold, afterward king of the Belgians, but their union was short and unhappy. She returned to the stage, and in 1844 married a Polish count. She published two volumes of theatrical reminiscences, and six years after her death her *Posthumous Memoirs* were printed. She died at Zurich, Oct. 18, 1877.

BAUER, GEORGE LORENZ, a German linguist and theologian; born in Hilpoltstein, Bavaria, Aug. 11, 1755. He occupied the chair of Oriental languages at Altdorf in 1789, and in Heidelberg in 1805. Two of his works are *Hermeneutica Sacra Veteris Testamenti* (1797); and *Biblische Theologie des Neuen Testaments* (1800–02). His theological views were those of a rationalist. He died in Heidelberg, Jan. 12, 1806.

BAUER, WILHELM, a German soldier and inventor; born at Dillingen, Dec. 23, 1822; died in Munich, June 18, 1875. He made a diving-boat, improved torpedoes used for the destruction of ships, and the method of firing guns under water. In the Schleswig-Holstein war he served gallantly, and afterward fought in the Russian army.

BAUERLE, ADOLPH, an Austrian author of comedies and novels; born in Vienna, April 9, 1786; died in Basel, Sept. 19, 1869. His works are amusing delineations of life in Vienna. He was the author of *Die Moderne Wirthschaft; Die falsche Primadonna;* and *Der Tausendasa.*

BAUERNFELD, EDUARD VON, an Austrian dramatist; born at Vienna, Jan. 3, 1802; died there, Aug. 9, 1890. Among his popular comedies are *Die Bekentnisse* (1834); *Bürgerlich und Romantisch* (1835); and *Grossjährig* (1846). His collected works were published in 12 volumes.

BAUGE, a town in the department of Maine-et-Loire, France, 23 miles E.N.E. of Angers. The English, under the Duke of Clarence, were defeated here in 1402. The town has manufactories of linens and woolens. Population 1891, 3,623.

BAUHINIA, a genus of plants of the family *Leguminosæ.* The leaves are generally divided into two lobes. The species are mostly natives of the warmer regions of both hemispheres, and some of them are remarkable for the size and beauty of their flowers. Most of them are twining plants, stretching like cables from tree to tree in the tropical forests, but some are small trees, as the mountain ebony of Jamaica, so called from the color of its wood. The inner bark of the Maloo climber, an East Indian species, is employed in making ropes. The leaves of various species are used for medicinal purposes.

BAUMGARTEN, HERMAN, a German historian; born at Lesse, in Brunswick, April 28, 1825. He studied at the universities of Jena, Halle, Leipsic and Bonn, and afterward devoted himself to journalism. He became, in 1861, professor of history and literature in the Polytechnic School of Carlsruhe, from which he was called to the chair of history at the University of Strasburg, in 1872. Among his works are *Geschichte Spaniens zur Zeit der Französischen Revolution* (1861); *Geschichte Spaniens vom Ausbruch der Französischen Revolution* (1865–71); *Zur Verständigung Zwischen Nord und Süd* (1859); *Wie Wir Wieder ein Volk Geworden Sind* (1870).

BAUMGARTEN, MICHAEL, a German theologian; born in Haseldorf, Holstein, March 25, 1812. He was appointed professor of theology at Rostock in 1850; suffered fine and imprisonment for publishing works denouncing the state church of Mecklenburg; was in favor of disestablishment, and founded the Protestantenverein (1865). He wrote *Apostolic History* (1859), and *Schleiermacher as Theologian* (1862). Died at Rostock, in Mecklenburg-Schwerin, July 21, 1889.

BAUMGARTNER, ANDREAS VON, BARON, a Bohemian statesman; born in Friedberg, Nov. 23, 1793; died at Vienna, July 29, 1865. He had the chair of physics at Vienna in 1823, and in 1851 was made Austrian minister of trade and public works, also president of the Academy of Sciences at Vienna. He wrote a book called *Naturlehre* (1823).

BAUMGARTNER, GALLUS JACOB, a Swiss politician; born in Alstätten, Zurich, Oct. 18, 1797; died at St. Gall, July 12, 1869. He belonged to the Liberal party, and was one of the revisers of the constitution of St. Gall. In 1848 he founded the *Neue Schweizer Zeitung.* One of his published works was *Die Schweiz in ihren Kämpfen und Umgestaltungen von 1830 bis 1850* (1853).

BAUMSTARK, ANTON, EDWARD AND REINHOLD, a family of eminent German writers. ANTON, born at Sinzheim, April 14, 1800, occupied, for nearly half a century, the chair of classical philology at Freiburg, where he died, March 28, 1876.—His son, REINHOLD, born at Freiburg in 1831, attracted much attention by his *Thoughts of*

*a Protestant on the Pope's Invitation* (1868), a work which was soon followed by his joining the Roman Catholic Church. His numerous writings embrace many valuable biographies, including those of his father and himself.—EDWARD, brother of Anton, born at Sinzheim, March 28, 1807, devoted himself to the study of political economy, and for some years taught that science in the University of Greifswald and in the Academy of Political Science and Agriculture at Eldena. He was elected to the national assembly after the revolution of 1848, advocated the union of German interests, and was a prominent supporter of Bismarck's policy. His writings are nearly all upon economic subjects. Died April 8, 1889.

BAUNARD, L'ABBÉ, LOUIS, a French ecclesiastical writer; born at Bellegarde, Loiret, in 1826. He became famous for his theological and literary studies, for which he received the double diploma of doctor of theology and letters. In 1877 he was called to the professorship of eloquence and history at the University of Lille. In 1881 he was placed in charge of the college of Sainte-Joseph, and later became rector of the same university; and was also named prelate to the pope. Among his works are *Vie des Saints et Personnages Illustres de l'Église d'Orléans* (1862–65); *Le Doute et ses Victimes dans le Siècle Présent* (1865) which was his greatest work. He also wrote the memoirs of Mme. Barat, foundress of the Society of the Sacred Heart of Jesus (1876), and of Mme. Duchesne, foundress of the Sacred Heart in America (1878). In 1881 appeared *La Foi et ses Victoires*.

BAVARIA, KINGDOM OF, a crown state of Germany. For description, early history, etc., see BAVARIA, Vol. III, p. 450.

King Louis II, having become insane, committed suicide, and was succeeded, June 13, 1886, by his brother, Otto Wilhelm Luitpold, who was born April 27, 1848, but was already demented. A regent was appointed in the person of the uncle of the two brothers, Prince Luitpold, June 10, 1886. Prince Luitpold was born March 12, 1821, and married the Archduchess Augusta of Austria, who died April 26, 1864. Three sons and one daughter were born of this marriage; the eldest son being Prince Ludwig, born Jan. 7, 1845, and married, Feb. 20, 1868, to the Archduchess Maria Theresa of Austria-Este, of which marriage there are ten children. The civil-list of the king, and allowances to other members of the royal family, amount to about 5,404,000 marks annually.

The area of Bavaria is 29,282 square miles; with a population (1890) of 5,594,982, or 191.6 per square mile. The population of the principal towns was as follows, in 1890: Munich, 350,594; Nuremberg, 142,590; Augsburg, 75,629; Würzburg, 61,039; Fürth, 43,206; Ratisbon, 37,934; Kaiserslautern, 37,047; Bamberg, 35,815; Ludwigshafen, 33,216; Bayreuth, 24,556; Hof, 24,455; Pirmasens, 21,041. The population is chiefly Roman Catholic, there being about 709 of these to 281 Protestants in every 1,000. Among the other sects are Old Catholics, Mennonites, Irvingites, Greek Catholics, Free Christians, etc. Education is well provided for, there being over 7,220 schools of all denominations, including Jewish. Besides these there are about 500 agricultural schools.

There is, in Bavaria, an Oberstes Landgericht, or appeal court, existing between the Oberlandesgerichte and the Reichsgericht. It has its seat at Munich, and has a bench of 18 judges; five Oberlandesgerichte and 28 Landgerichte are subject to its jurisdiction.

The total expenditure for the financial year 1894–95 was 328,341,269 marks. The debt at this period amounted to 1,388,856,567 marks, of which the greater part was for railway debt. The greater number of railways belong to the state; and for the last 5 or 6 years the annual receipts from this source have exceeded the charges for the railway debt sometimes by as much 6,000,000 marks in a year. The Bavarian army forms an integral part of the German imperial army, having in peace its own administration. Its total strength consists of 63,000 men.

Nearly one half of the total area is under cultivation; one sixth is under grass, and one third is in forests. The number of separate farms is about 681,520, and these support a population of 2,660,000, about half of whom are actually engaged in the cultivation of the soil. The principal crop is rye, there being about 554,426 hectares of this cultivated annually; next come oats with 450,000 hectares, barley with about 353,000 hectares, wheat with 323,000 hectares, potatoes with 316,000 hectares, hops with 26,000 hectares.

Vines occupy about 23,700 hectares, yielding 737,600 hectoliters of wine annually. About 2,200 hectares are planted with tobacco, yielding 4,131 metric tons of dried leaf. The average quantity of beer produced is about 15,020,000 hectoliters, of which a seventh is exported. About 183,000 hectoliters of alcohol are also yearly produced by distilleries. The total value of the principal mining products of the country is about 10,700,000 marks yearly.

BAVARIA, a colossal statue at Munich, bearing the name of the country of which it is a personification. It was erected by King Louis, the model having been executed by Schwanthaler. The figure bears a German aspect. The Bavarian Lion, the guardian of her kingdom, reposes at the side of the female, in a sitting attitude. The statue is 65 feet high, the pedestal being 30, so that the whole monument has a height of 95 feet. It was cast from the bronze of Turkish and Norwegian cannon. Internally it is very remarkable. Through the back part of the pedestal a door leads to a stone staircase consisting of 60 steps. The figure itself is hollow and resembles a mine, with a side passage, which leads into the lion. A staircase of cast-iron of 58 steps leads through the neck up into the head, where there are two sofas, and several openings for the enjoyment of the view. The head contains standing-room for 31 persons. The figure consists of seven pieces, the lion of five. The monument was uncovered Aug. 7, 1850.

BAVINS. See FASCINES, in these Supplements.

BAWBEE OR BABEE, the popular designation of a halfpenny in Scotland, now dropping out of use. The origin of the term is obscure, but it is most probably a corruption of *bas billon* (French), applicable to debased copper money. In the plural form the word is often popularly used in Scotland to signify money generally. In Scottish song, bawbee is synonymous with a girl's fortune or marriage portion, as *Jenny's Bawbee.*

BAXTER, WILLIAM EDWARD, a Scottish litterateur and statesman; born at Dundee in 1825; died in London, Aug. 10, 1890. His writings are chiefly descriptive of his travels in Europe, Asia, Africa and America. He was returned to Parliament as a Liberal for the Montrose burghs in 1855, 1868 and 1874. He resigned his seat in 1885. He was successively secretary to the Admiralty and secretary to the Treasury. He was well known for his opposition to church establishments, and was the author of *America and Americans* (1855).

BAXTERIANS, a term applied to those who adhered to Baxter's theological system. (See BAXTER, RICHARD, Vol. III, p. 454.) The tendency of Baxter's views was toward a more liberal theology, but they are deficient in logical consistency. Nevertheless they have been, and still are, embraced by many pious people, especially among the dissenters, who shrink from accepting what they consider the hard conclusions of Calvinism or the latitudinarian views of Arminianism.

BAXTER SPRINGS, a town in Cherokee County, southeastern Kansas, on Spring River and Kansas City, Fort Scott and Memphis railroads, 61 miles S. of Fort Scott. It is in a mineral section, having coal, lead and zinc mines near. It has a lead-smelting works, and was a shipping-point for cattle driven from frontier ranches. It was also the scene of a murderous raid by Quantrell, the Southern guerilla leader, in 1863. Population 1890, 1,248; 1895, 1,566.

BAY, a name given to a number of trees and shrubs resembling the laurel (*Laurus nobilis*), which is also called sweet bay. The name is also applied to numerous other species more or less resembling the noble bay, as "bull-bay" (*Magnolia grandiflora*), "cherry-bay" (*Prenus Laurocerasis*), "dwarf-bay" (*Daphne Laureola*), "Indian" or "royal bay" (*Laurus Indica*), "loblolly-bay," (*Gordonia Lasianthus*), "red bay" (*Persea Caroliensis*), "sweet-bay" or "white bay" (*Magnolia glauca*), etc. Bay leaves are sometimes used in cookery for the flavor. Since early times they have been associated with popular superstitious usages.

The fruit of *Laurus nobilis*, the common bay tree, is called bayberry; also that of the wax-myrtle, *Myrica cerifera.* The latter produces a coating of wax known as bayberry tallow, or myrtle-wax, sometimes employed for making candles, and much used in pharmacy. This tree has active medicinal properties. It is found along the Atlantic coast of the United States. Also, in Jamaica, applied to *Pimenta acris*, from which an oil is obtained, which is used in the manufacture of bay rum.

BAYA, a small East Indian bird of the family *Plocidæ* and related to the weaver-bird. Its flask-shaped nest, with entrance at the bottom, is suspended from twigs, in order to protect against mammalian enemies. It is often tamed and taught to obey commands.

BAYADERE. See NAUTCH-GIRLS, in these Supplements.

BAYARD, JAMES ASHETON; born in Philadelphia, July 28, 1767. He graduated at Princeton and then practiced law at Wilmington. He was sent to England in 1795 as American agent in ship cases growing out of the Orders in Council, and in 1796 was elected to Congress as a Federalist. In 1797 he managed the successful impeachment of William Blount, a Senator from Tennessee, on the charge of plotting, while governor of the Southwest, to put the British in possession of New Orleans. When the electoral college was equally divided between Jefferson and Burr in 1800, it was the influence of Bayard and Hamilton that determined the choice of Jefferson by the House of Representatives. He was appointed minister to France by President John Adams, before the new administration of 1801, and although confirmed by the Senate, he declined the office. His service extended from May 15, 1797, till March 3, 1803, and in 1804 he became United States Senator, as the successor of William H. Wells. He served from Jan. 15, 1805, till March 3, 1813, and opposed the declaration of war against Great Britain in 1812. In 1813 President Madison appointed him a commissioner, with Albert Gallatin (rejected by the Senate) and John Quincy Adams, to negotiate a peace with Great Britain, through the mediation of Russia. He left Philadelphia May 8, 1813, and met Mr. Adams in St. Petersburg in July. This mission was not successful, and he went to Holland and took a prominent part in the negotiations resulting in the treaty of peace signed in Ghent, Dec. 24, 1814. He was appointed United States minister to Russia, but declined the office, and returned to Wilmington on June 15, 1814, where he died, August 6th, following.

BAYARD, JAMES ASHETON, JR., son of the preceding, born at Wilmington, Delaware, Nov. 15, 1799; died at the same place, June 13, 1880. He studied and practiced law at Wilmington, and was United States attorney for his state during Van Buren's Presidency. He entered the Senate in 1851, and was successively re-elected in 1857 and 1862. Mr. Bayard was a Democrat, a believer in state rights, and presided over that part of the national Democratic convention of 1860 which nominated J. C. Breckinridge for the Presidency in opposition to Douglas, thus giving the electoral vote to Lincoln. He was brother of Richard Henry Bayard. The two brothers, the father, James Asheton Bayard, Sr., Thomas F. (son of James Asheton Bayard, Jr.), and Governor Bassett, grandfather of the first two mentioned, occupied seats in the United States Senate.

BAYARD, JEAN FRANÇOIS ALFRED, born at Charolles, March 17, 1796, died in Paris, Feb. 19, 1853. He wrote a great number of popular comedies, two of which were *La Reine de Seize Ans* (1828) and *Les Gamins de Paris* (1832).

BAYARD, RICHARD HENRY, son of James Asheton Bayard, Sr.; born at Wilmington, Delaware, 1796; died at Philadelphia, March 4, 1868. He graduated at Princeton, studied and practiced law in his native city, and in 1836 was elected to the United States Senate. Before his term expired he was elected chief justice of Delaware. He was again sent to Congress, and from 1850 to 1853 he represented the United States at Brussels.

BAYARD, THOMAS FRANCIS, the son of James A. Bayard, Jr., was born at Wilmington, Delaware, Oct. 29, 1828. He received his academic education at an Episcopal school in Flushing, Long Island, and afterward entered a mercantile house in New York. In 1848 he returned to his native city and entered his father's law office, and was admitted to the bar in 1851. He served for one year as United States district attorney for Delaware.



THOMAS FRANCIS BAYARD.

From 1869 to 1885 he represented his state in the United States Senate, being elected president *pro tem.* in 1881. President Cleveland selected Mr. Bayard for his Secretary of State in 1885. Mr. Bayard was a member, in 1876–77, of the famous electoral commission that seated Mr. Hayes in the White House. In March, 1893, Mr. Bayard was appointed United States ambassador to the Court of St. James's at London, and was the first to hold that rank. The leading questions at issue between the two governments were the Bering Sea dispute and the Venezuelan boundary on the British Guiana front. The ambassador was highly popular in England, and was called upon for many social duties and public addresses. Because of his criticism of the protection policy and party of his own country, in speeches delivered in Edinburgh and in Boston, England, he was censured by a large majority vote of the House of Representatives on March 20, 1896, but he did not resign. A few weeks later Oxford honored him with a doctorate of laws.

BAY CITY, a city and the capital of Bay County, east-central Michigan, situated on the east bank of the Saginaw River, 5 miles from Saginaw Bay, 78 miles N.N.E. of Lansing, the capital of the state, and 108 miles N.N.W. of Detroit. It is on the Jackson, Lansing and Saginaw railroad, and is the terminus of the Detroit and Bay City and the East Saginaw railroads. The city is handsomely laid out, having wide and straight streets, crossing at right angles. Several of the avenues are 80 to 100 feet wide. This city has extensive mills for sawing timber, and has a great lumber trade. Here, also, are manufactured and exported great quantities of salt. There are here some 350 manufacturing establishments, having an aggregate capital of $10,000,000, employing 5,000 hands, and putting out over $9,000,000 worth of products. The city is well and substantially built, the business portion chiefly of brick. It is connected with West Bay City (formerly Wenona) and Salsburg, on the other side of the river, by three bridges. One of these was built by the Michigan Central Railroad Company. The Holly system of water-works is used to supply the city with pure water from Saginaw Bay. There are about 20 churches, good schools, a high school and public library. Here are two national and two other banks. Bay City was incorporated in 1865. Population 1860, 1,583; 1870, 7,064; 1890, 27,893; 1895, 30,039.

BAYER, JOHANN, a German astronomer; born at Augsburg in 1572; died in 1660. He was an earnest Protestant pastor, but he is now remembered for the new system which he introduced for the naming of the stars. He published *Uranometria* (1603), containing 51 astronomical charts, which he supplemented with an explanatory volume, *Explicatio* (1654). These were not altogether accurate, but he employed the method of naming the stars in a constellation after the letters of the Greek alphabet, those of greatest brilliance being named in order from the first letters. This method has been followed from his time to the present. See ASTRONOMY, Vol. II, p. 754.

BAYEUX TAPESTRY. See BAYEUX, Vol. III, p. 458; EMBROIDERY, Vol. VIII, p. 162.

BAYFIELD, a town in Bayfield County, northern Wisconsin, formerly the capital of the county, on an arm of Lake Superior, at the terminus of the Chicago, St. Paul, Minneapolis and Omaha railroad, 500 miles N. of Chicago. It is a summer resort, has a fine harbor, and is a shipping-point for lumber. Population 1890, 1,373.

BAY ISLANDS, a small group in the Bay of Honduras. See HONDURAS, Vol. XII, p. 131.

BAYLEN, a town in the province of Andalusia, Spain, 22 miles N.N.E. of Jean. It is celebrated as the place where the Spaniards under General Castanos forced the surrender of 18,000 French under Marshal Dupont, July 22, 1808, on account of which event he was made Duke of Baylen. It has manufactories of linen, glass, bricks, tiles, soap, etc. Population 8,000.

BAYLES, JAMES C., born in New York City, July 3, 1845. He served for a time in the Civil War, but ill health obliged him to resign his lieutenant's commission. He turned his attention to journalism, and was editor of the New York *Citizen*, and afterward of the New York *Commercial Bulletin*, the *Iron Age*, and the *Metal-Worker*. He made a study of metallurgy, sanitary topics and the labor question.

BAYLEY, JAMES ROOSEVELT, a Roman Catholic prelate; born in New York City, Aug. 23, 1814; died at Newark, New Jersey, Oct. 3, 1877. He graduated at Trinity College, Hartford, in 1835. After a year's study of medicine he turned his

attention to theology, and was, in 1840, established as rector in Harlem. Becoming dissatisfied with Episcopal doctrines, he resigned his charge, went to Europe, and in 1844 took priest's orders in the Catholic Church. He was made vice-president and then president of St. John's College, Fordham; was pastor of a church on Staten Island; private secretary to Bishop Hughes; and in 1853 was created first bishop of Newark. In 1872 he was made archbishop of Baltimore, which placed him at the head of the hierarchy in the United States. Archbishop Bayley was a philanthropic man, an untiring worker and the author of historical works relating to the Roman Catholic Church.

BAYLOR UNIVERSITY, the oldest collegiate institution in Texas, is located at Waco, McLennan County, Texas. It originated with a Baptist educational society, which obtained a charter for it in 1845, naming it for R. E. B. Baylor, an immigrant from Kentucky who had been in Congress, was long a judge in Texas, and officiated as a preacher, and locating it at Independence, Washington County. In 1861, owing to the refusal of the citizens to co-operate in bringing a railroad to that town, the president and most of the faculty removed to Waco to found an institution there, leaving the old college to struggle on. In 1886 the two institutions united at Waco under the old name. It is open to both sexes; has a collegiate, a law, a preparatory, a musical, an elocution and an art department, and the tuition is small. There are two fine dormitories, and the grounds and buildings are valued at over $160,000, but the productive endowment is small; the library has 6,000 volumes. In the academic year of 1895–96 there were 21 members of the faculty and an enrollment of 552 students.

BAYLY, Edna Ellen, an English novelist, born at Brighton, where she was educated. She was attracted to literature, and early resolved to be a writer of fiction, and published her first novel, *Won by Waiting* (1879), under the pseudonym of "Edna Lyall." In 1882 she achieved distinction with *Donovan*, which was followed, in 1884, by *We Two*. These books are written in a vein of religious doubt and speculation, and were widely read. Her later works are *In the Golden Days* (1885); *Knight Errant* (1887); *Autobiography of a Slander* (1887); *Derrick Vaughan, Novelist* (1889); *A Hardy Norseman* (1889); *Max Hereford's Dream* (1891); *To Right the Wrong* (1893); *Doreen: The Story of a Singer* (1894). Miss Bayly is the daughter of the late Robert Bayly, barrister at law, and resides at Eastbourne, on the coast of Sussex.

BAYLY, Lewis, bishop of Bangor, Wales; born at Caermarthen, educated at Oxford, consecrated bishop in 1616, and died in 1632. His famous book, *The Practice of Piety*, passed through 51 editions, besides being translated into several foreign languages, among them being an abridged Mohican version by John Eliot, "Apostle to the Indians." His son, Thomas, became a Catholic, and wrote *The End of Controversy*.

BAYLY, Thomas Haynes, an English song-writer and author; born at Bath, Oct. 13, 1797; died April 22, 1839. He was educated at Oxford, and studied law and theology, but discovering his talents as a ballad-writer, gave up these pursuits and went to London, where he composed *The Soldier's Tear; I 'd Be a Butterfly; Oh, No; We Never Mention Her;* and others. Besides popular songs he wrote tales, a novel, volumes of verse and several dramatic pieces.

BAYNE, Peter, a Scotch writer, born at Fodderty, Ross-shire, Oct. 19, 1830. He studied in Marischal College, Aberdeen; later edited newspapers in Glasgow, Edinburgh and London, and contributed theological and antiquarian articles of great erudition to periodical literature. He wrote *Christian Life at the Present Time; Chief Actors in the Puritan Revolution; Lessons from My Masters; Two Great Englishwomen; Life of Luther;* and a *Life of Hugh Miller*, whom he succeeded as editor of *The Witness*. The article on Miller, in this Encyclopædia, is from his pen. For more than twenty years he was one of the editors of the *Christian World*, and an exponent of liberal ideas in religion and politics. Died Feb. 11, 1896.

BAYNES, Robert Hall, an English religious writer, born in Wellington, Somerset, March 10, 1831. He was educated at St. Edmund's Hall, Oxford; and after being ordained in 1855, became honorary canon of Worcester Cathedral in 1873, and was bishop-designate of Madagascar, 1870–71. He published numerous books of hymns and other sacred writings, and among his works are *Lyra Anglicana* (1862); *English Lyrics: A Collection of English Poetry of the Present Day* (1865); *Autumn Memories, and Other Verses* (1868); *Home Songs for Quiet Hours* (1873); *By the Waters of Babylon* (1886).

BAYNES, Thomas Spencer, a versatile author; born at Wellington, Somerset, March 24, 1823; died at St. Andrews, May 29, 1887. He pursued his studies at Bristol College and Edinburgh University. He assisted Sir William Hamilton in a translation of *Port Royal Logic* (1851), and an *Essay on the New Analytic of Logical Forms*. From 1857 to 1864 he was assistant editor of the *Daily News*, at the end of which time he took the chair of logic, rhetoric and metaphysics in St. Andrews University. He was a contributor to periodicals, and editor of the ninth edition of the Encyclopædia Britannica, for which he wrote the article on Shakespeare. See Vol. XX, pp. 737, 768.

BAY OF ISLANDS, a large bay on the western coast of Newfoundland, north of St. George's Bay, inclosing a number of islands. The name is also given to a settlement on the bay, on what is called the French Shore. Herring-fishing is the chief industry, about 30,000 barrels being annually taken. Limestone, marble, and quantities of gypsum are found here.

A large, deep and safe harbor near the northern extremity of New Zealand is also called Bay of Islands. On its southern side is the port and town of Russell, the seat of a United States consulate.

BAYONET, a weapon. See Arms, Vol. II, p. 558.

BAYONNE is a rapidly growing city in Hudson County, New Jersey, adjoining Jersey City on the south. It is situated on the tongue of land that separates New York and Newark bays. The former villages of Bergen Point, Centerville, Bayonne, and Saltesville now compose this city, through which runs the Central Railroad of New Jersey. Bayonne is separated from Jersey City by the Morris Canal, and from Staten Island by the Kill-von-Kull. On the Kill-von-Kull the Port Johnson coal-docks are situated, near Bergen Point. At these docks several hundred men are employed in receiving and shipping coal. About 40 trains run daily to and from New York. Here are color-works, paint-works, chemical-works, and petroleum-refineries. Population in 1880, 9,372; in 1890, 18,996; in 1895, 19,856.

BAYOU. Name given to a narrow, sluggish stream draining marshy lowlands, or connecting low-lying lakes. Bayou, from the French *boyau*, a long, narrow place, was first used to designate the marshy watercourses of Louisiana, by the early French colonists. See LOUISIANA, Vol. XV, p. 20.

BAY RUM, a fragrant liquid obtained by distilling with rum the leaves of the bayberry (*Myrsia acris*), a tree which grows in the West Indies and belongs to the order *Myrtaceæ*.

BAY SAINT LOUIS, a city, formerly Shieldsboro, capital of Hancock County, southern Mississippi, located on a bay of the same name, which receives the Jordan River and empties into Mississippi Sound; 48 miles N.E. from New Orleans; settled in the eighteenth century by immigrants from France; is an attractive watering-place. Population 1890, 1,974, exclusive of summer visitors.

BAY SHORE, a village in Islip township, Suffolk County, Long Island, New York; on the shore of Great South Bay; on the southern line of the Long Island railroad, about 40 miles E. of Brooklyn City Hall; the nearest point to Fire Island; a resort for yacht clubs, amateur fishermen and athletic clubs; has large hotels, electric lights, water-works, a fine shore drive, and in 1890 had a resident population of 2,290.

BAY WINDOW. It is frequently, but incorrectly, termed "bow window." A "bow" window is always the segment of an arc, a modification of the bay window. See ARCHITECTURE, Vol. II, p. 460.

BAZAAR OR BAZAR, a Persian word signifying a market-place, and used in Turkey, Egypt, Persia and India to distinguish those parts of towns which are exclusively devoted to trade. They resemble, in some respects, our markets; in other respects, American retail stores, especially department stores. Regular bazaars consist of a connected series of streets and lanes, and if of the better class, they are vaulted, with high roofs. Their peculiarity is, that all the shops of a city are there assembled, instead of being dispersed in different streets, as in American and European cities, and that all the shops of each different trade or occupation are grouped by themselves, instead of being indiscriminately mingled. Another feature is, that business in a bazaar is not restricted to professional tradesmen, but any person not in business, or a stranger wishing to dispose of any article, may employ a crier to take it through the bazaar, loudly proclaiming its merits and price. Ispahan, Tabriz, Constantinople, Bagdad, Cabul, Damascus and Cairo have famous bazaars. In the United States the word has come to signify a store or booth where miscellaneous or fancy articles are sold, usually for charitable purposes, and chiefly differing from an arcade in not having distinct shops. Such bazaars are of very recent date, but scarcely differ from the old "Royal Exchange" and "Exeter 'Change," in the Strand, London, so often mentioned in the light literature of England about the year 1700.

BAZAINE, FRANÇOIS ACHILLE, marshal of France and senator of the empire; born at Versailles, Feb. 13, 1811; died at Madrid, Spain, Sept. 23, 1888. He became a soldier in 1831; served with distinction and frequent promotion; at first in Algiers; then against the Carlists in Spain; then in the Crimean War, where, at the siege of Sebastopol, Generals Canrobert and Pélissier gave him great praise for bravery and ability; then, in the Italian war of 1859, at Magenta and Solferino; and from 1862 to 1867 with Maximilian in Mexico. Recalled to France because, after he had married a Mexican wife of patriotic family, his loyalty to Maximilian was doubted, he retained the favor of Napoleon III, and in 1869 was made commander of the Imperial Guard, the choicest body of troops in France, having become marshal of France in 1863, after his entry into the City of Mexico.

At the outbreak of the Franco-Prussian war in 1870, he commanded the third corps of the army of the Rhine, then in the vicinity of Metz. Political considerations deterred him from falling back to join MacMahon at a critical time, and after the battles of Mars-la-Tour and Gravelotte he occupied the fortress of Metz, and was surrounded by the army of Prince Frederick Charles. After many weeks of investment, during which he attempted several bloody but unsuccessful sorties, he surrendered his army of 170,000 men and 6,000 officers under humiliating conditions, Oct. 27, 1870. For this he was tried by courtmartial, in deference to a popular belief that he had intrigued with the enemy to restore the fallen empire, and also on account of his own avowals that after the disaster at Sedan, Sept. 2, 1870, he had felt no obligation to obey the government of national defense. His trial ended with sentence of death, Dec. 27, 1873, which was commuted by President MacMahon to imprisonment for 20 years. Aug. 9, 1874, he escaped from Isle Ste. Marguerite, where he was confined, and soon reached Switzerland, where he received a cordial welcome from the French Empress and Prince Imperial. After a brief stay in England and Portugal, he passed the remainder of his life in Spain.

His writings include a long letter to the New York *Herald*, published in that journal, Sept. 12 and 25, 1874, in which he defended his reputation and made scathing criticisms upon his accusers

and contemporaries; also a book with the same purpose, entitled *Épisodes de la Guerre de 1870, et le Blocus de Metz* (1883), and *L'Armée du Rhin depuis le 12 Aout jusq'au 29 Octobre, 1870* (1872).

BAZALGETTE, Sir Joseph William, an English civil engineer of French descent; born in 1819. After service in Ireland under Sir John McNeil, he was called to London as an engineer upon the sewer system of that city, and won fame by constructing sewers, altering streets and making river embankments. He was engineer-in-chief of the metropolitan board of works in London, and introduced a system of working underground in the laying of water and gas pipes, the construction of which he supervised in many cities of the United Kingdom, and in Brussels and Budapest. He died in London, March 15, 1891.

BAZANCOURT, Cesar, Baron de, a French writer; born in 1810; died Jan. 25, 1865. Louis Philippe made him director of the library of Compiègne, and under Napoleon III he held the office of historiographer. He wrote histories of the Crimean, Italian, Chinese and Cochin Chinese wars of Napoleon III, besides a history of Sicily under the Norman rule. A book relating to fencing, entitled *The Secrets of the Sword* (1861), is ascribed to him.

BAZARDJIK, a Bulgarian town, 26 miles N. of Varna; holds an important fair in April. Population, 5,000. Sometimes called Hadji-Oglou Bazardjik.

BAZARDJIK, Tatar, a town of eastern Rumelia, on the Maritza River, 23 miles W. of Philippopolis; an important railroad station. There are warm baths in the vicinity. The town is surrounded by rice-fields and has manufactures of saltpeter. Altitude, 680 feet; population 1888, 15,000.

BAZIN, Anaïs de Raucou, French lawyer and historian; born in Paris, Jan. 26, 1797; died in 1850. Among his works are *The Court of Marie de Medicis* (1830); *History of France under the Ministry of Cardinal Mazarin* (1837); *Studies in History and Biography* (1844); and *The Nameless Epoch*, a moral and historical essay on the condition of Paris after 1830.

BAZIN, Antoine Pierre Ernest, a French physician, the descendant of a long line of medical practitioners, was born at St. Brice, Feb. 20, 1807. He wrote much on skin diseases, and in 1847 became physician and professor of dermatology in the St. Louis Hospital of Paris. He died in Paris, Dec. 14, 1878.

BAZIN, Antoine Pierre Louis, brother of the preceding; born March 26, 1799; died in January, 1863. He was a translator of many Chinese works, a professor of the Chinese language, and author of a grammar of the Mandarin dialect.

BAZIN, Henri, a French civil engineer; born Oct. 20, 1829; educated in the technical School of Bridges and Roads, Paris, and for some time occupied in railroad engineering for the French government. In 1856 he was assigned to canal and inundation work in the department of Côte-d'Or, and assisted Darcy in his valuable experiments on the rapidity of water-flow in open channels. In fact, Bazin, continuing the work after Darcy's death in 1858, may be said to have been the father of the new science of the flow of water. He published many papers on scientific and engineering subjects, and was made an officer of the Legion of Honor.

BAZLEY, Sir Thomas, Bart., an English manufacturer and politician; born at Ginlow, Lancashire, England, in 1797. In 1826 he employed over 1,000 persons at Manchester in the making of fine cotton and lace thread. He established free schools and lectures for his employees. He entered Parliament in 1858, where he was known as a free-trader and anti-corn-law man; in 1869 he was made a baronet. Died March 18, 1885.

BAZOCHE, a corruption of the word *basilica*, originally signified a petty court established by the clerks of the proctors who practiced in the old parliament of Paris for the purpose of enforcing discipline and settling disputes among themselves and between themselves and tradespeople. In 1305 Philip the Fair permitted them to incorporate, and their society, called the Bazoche of the Palace, rapidly increased and finally became a guild of lawyers' clerks, which was the recipient of numerous privileges; among them that of coining money for its own needs. They also had the fantastic feature of possessing a king, chancellor, and other dignitaries of their own, and at stated times held imposing processions and other festivities, a chief feature of which was the performance of "Moralities," or allegorical plays representing the virtues and vices. The actors delivered themselves of much wit and satire in allusions to noted characters, passing events and the vices of the day, and the morality play with these innovations became the forerunner of the modern farce and comedy. These rude performances so increased in coarseness that they were frequently, and finally in 1540, under penalty of death, interdicted, although the guild continued in effect as to its other features until the outbreak of the first French revolution, when it formed a battalion, and in red uniform with silver buttons took part in the storming of the Bastile. The guild was abolished in 1790.

BEACH, Moses S., American publisher; born in Springfield, Massachusetts, Oct. 25, 1822; died in Peekskill, New York, July 25, 1892. He was an elder brother of the owner of the *Scientific American*, and son of Moses Y. Beach. He became proprietor of the New York *Sun* in 1852, and did much to raise it to eminence.

BEACH, Moses Yale, an eminent American inventor and publisher; born at Wallingford, Connecticut, Jan. 7, 1800; died there, July 18, 1868. He was long connected financially with the New York *Sun*, and is regarded as the originator of the American one-cent newspaper. He invented the rag-cutting machine now generally used in making paper, and was much interested in experiments on machines for propelling balloons.

BEACH-PLUM (*Prunus maritima*), a straggling bush found growing along the Atlantic coast

of the United States. It bears a red or purple fruit, which is somewhat like the cultivated plum, and is eaten either fresh or preserved.

BEACON, a signal. The term is commonly used of any signal set upon a height to give news of momentous events, or to give warning of danger. In former times alarm-fires at night, and columns of smoke by day, were used for these purposes; but there are beacons of every imaginable variety, from substantial stone pillars and iron structures on piles, to heaps of stones and poles with baskets or bushes at their head. In America and England, great numbers of beacons, usually of iron framework, have been erected by the Lighthouse Board, and Trinity House Corporation, respectively, for the guidance of vessels entering channels, harbors and rivers. See also LIGHTHOUSE, Vol. XIV, pp. 625, 626.

BEACONSFIELD, EARL OF (BENJAMIN DISRAELI), was born in London, England, Dec. 21, 1804. His father was Isaac Disraeli, the author of *Curiosities of Literature* and other works. (See D'ISRAELI, Vol. VII, pp. 259–60.) The boy was articled to a law firm, but abandoned this for literature, and at the age of 22 produced *Vivian Grey*, a work which brought him into immediate notice. He spent several years in Continental travel, and in 1832 offered himself as a candidate for Parliament. He was four times defeated, his political ideas at that time being of a radical, if not revolutionary, character; but he soon became a Tory, and as such was returned to Parliament for Maidstone in 1837. His first speech in the House of Commons was an extravaganza, to which the members refused to listen, but before sitting down he cried to the House that the time would come when he would compel it to hear him. At this time Disraeli affected the extravagant in dress and language, and was considered the leader of the "dandies," or "Young England" party. In 1839 he married an elderly widow possessed of a large fortune, abandoned his eccentric mannerisms, and entered upon the upward course which was to lead him to the premiership. Before he had been ten years in Parliament he had conquered ridicule and dislike, and had made himself at once respected and feared. During this period he issued, in rapid succession, several romances, of which *Coningsby*, *Sybil*, *Tancred*, *Contarini Fleming*, *Henrietta Temple* and *The Young Duke* are the best known.



EARL OF BEACONSFIELD.

Mr. Disraeli made a great reputation as a Parliamentary debater by his speeches in opposition to Sir Robert Peel's free-trade measures, and on the death of Lord George Bentinck, whose *Life* he subsequently wrote, in September, 1848, he became the leader in the House of Commons of the Tory-Protectionist party. They had wealth, and he possessed brains, and although they distrusted him, they could not afford to lose his sarcastic oratory and his keen political prescience. In March, 1852, he obtained his first cabinet appointment, that of Chancellor of the Exchequer (finance minister) in the Derby ministry. This government was outvoted in December following, and Disraeli remained in opposition for six years. In 1847 he had become member for Buckinghamshire, for which he sat until 1876, when he was elevated to the peerage. On the defeat of Lord Palmerston over the Conspiracy Act in 1858, Disraeli again became Chancellor of the Exchequer, with Earl Derby as Prime Minister. In order to "dish the Whigs," he proposed a bill for electoral reform, but the measure, which was much more ingenious than useful, was rejected, and the ministry resigned in June, 1859. Seven years of a Liberal administration followed. In June, 1866, Lord John Russell was beaten over another reform bill, and Disraeli for the third time became Chancellor of the Exchequer. In a few months he had converted his party to the necessity of electoral reform, and had introduced and carried a bill for a more radical extension of the franchise, based on household suffrage, than had been proposed by the Liberals and fought to the death by Disraeli and the Tory squires. In February, 1868, Lord Derby resigned and Disraeli succeeded him as Prime Minister. Two months later Mr. Gladstone introduced his famous resolutions for the disestablishment and disendowment of the state church in Ireland. The government was defeated twice; Parliament was dissolved in July; and as a result of the general election which followed in November, Mr. Disraeli resigned without meeting Parliament. From that time until January, 1874, when Mr. Gladstone dissolved the first reform Parliament, Mr. Disraeli remained in opposition. In 1870 he broke his long silence as an author, by the publication of *Lothair*, a work which, from the fame of its author, attracted an amount of interest not justified by its intrinsic merits. Ten years later he gave to the world *Endymion*, a romance in his earlier style. In 1872 he lost his wife, to whom, notwithstanding the disparity in their ages, he was devotedly attached. In 1873 he was elected lord rector of Glasgow University.

In the early part of 1874 Parliament met, with a large Conservative majority, and Mr. Disraeli began his final and longest lease of power. On Aug. 11, 1876, finding himself no longer equal to the toils of House of Commons life, he made his last speech in that assembly, and next day the Prime Minister was known as the Earl of Beaconsfield. He had refused the title before, but his wife had been made a countess in her own right. During his last administration, backed by a powerful and compact Conservative majority, Lord Beaconsfield lost no opportunty of cultivating the spirit of what the French call "chauvinism," for which the English equivalent is "jingoism." By a vigorous foreign policy, or in other words, by intervening in European diplomatic

questions and stoutly asserting England's interest therein, he sought to divert the attention of the people from the government's neglect of needed reforms or its continuance of time-honored abuses. His sensational pilgrimage to Berlin, from which he returned, claiming to bring "peace with honor," offset, in the popular estimate, the costly and unnecessary wars in Afghanistan and South Africa. He had humbled Russia by the Berlin Treaty of 1878 and arranged a new settlement of the Eastern question. In return, the Sublime Porte rewarded him by a virtual cession of Cyprus to the British crown, and he electrified Europe by announcing a secret purchase, for the government, of a controlling interest in the shares of the Suez Canal, thus securing to Great Britain control over that route to India. He also established, in 1879, the dual control of France and England over the fiscal system of Egypt, and it was his work of imperialism to add the title of "Empress of India" to the other titles of the British Queen. When, in 1880, the people got a chance to speak, their verdict was one of condemnation, and Mr. Gladstone came back to power with a Liberal majority of 150. Earl Beaconsfield spoke but a few times in the House of Lords after this. In March following he was seized with combined gout and pneumonia, and on April 19, 1881, he died. He was baptized in the Church of England in 1817, and with her rites his remains were laid to rest in the parish church of Hughenden, Buckinghamshire.

BEAGLE, a small variety of hound; the smallest are sometimes called "lap-dog beagles." See DOG, Vol. VII, pp. 329, 330.

BEALE, LIONEL SMITH, an English microscopist and physician, was born in London in 1828; educated at King's College, London, of which he became a fellow; fellow of the Royal Society of Physicians; professor of medicine in King's College; government medical referee for England; member of numerous microscopical, medical, and other learned societies, both domestic and foreign; author of works of original investigation and of highest authority; contributor to *Philosophical Transactions;* the *Proceedings* of the Royal Society; the *Lancet;* and other periodicals. Among his books, besides treatises relating to nerve-currents and to diseases of the liver and kidneys, he has published the following important works: *How to Work with the Microscope* (1851); *Protoplasm, or Life, Matter and Mind* (1869), a most conservative and excellent introduction to biology and histology; *Disease Germs* (1870); *Life Theories: Their Influence on Religious Thought* (1871); *Bioplasm: An Introduction to the Study of Physiology and Medicine* (1872); *On Life and on Vital Action* (1875); *Principles and Practice of Medicine* (1880); *Our Morality and the Moral Question* (1886), considered from a medical point of view; and, in part, *The Physiological Anatomy and Physiology of Man.* His important works are highly illustrated with microscopical figures prepared by himself.

BEAM TREE, WHITE (*Pyrus aria*), a tree from 20 to 40 feet in height, with a straight, erect trunk, and a round or oval head. The leaves are ovate and serrate, white and downy beneath; the flowers in large terminal corymbs; the fruit scarlet, the size of a small pea, acid and astringent, but becomes agreeable by incipient decay. It is sometimes called service-berry, and resembles it in quality, although much smaller. Beer is made of it by fermentation. The wood, very hard and fine-grained, is used for cog-wheels. The whiteness of the foliage makes the tree ornamental in plantations. It is a native of Europe and Asia.

BEAN, TARLETON HOFFMAN, an American scientist and physician; born at Bainbridge, Pennsylvania, Oct. 8, 1846; an educator during his early life, and since 1874 identified with the work of the United States Fish Commission, of which he is ichthyologist; is a well-known traveler, writer and contributor of articles, both scientific and entertaining, upon his chosen specialty. His *Report on the Fishes of Pennsylvania*, and the memoir on *Deep Sea Fishes of the Atlantic Basin*, are probably his most widely known writings, the last-named being in collaboration with Dr. G. Brown Goode.

BEAN–CAPER (*Zygophyllum Fabago*), a small tree found in the Levant, where its flower-buds are used as a substitute for capers.

BEAN–FEAST, an old English custom, not wholly obsolete, whereby employers and their workmen enjoy an annual feast at Michaelmastide, when the "bean-goose" (*Anser segetum*), a small wild goose, whose bill has a fancied resemblance to a bean, is in season and constitutes an important and traditionally appropriate dish for the occasion. The name originated in the northern counties of England, where the bean-goose is common. *The Bean-Feast* is the subject of a well-known painting by the Dutch master, Jakob Jordaens.

BEAN–KING'S FESTIVAL, a social rite, principally observed in France, from which country it seems to have been transplanted to Germany. On the evening of the Twelfth-Day, or as the Germans call it (in allusion to the legend that the wise men of the East, who came to worship Christ were three kings), Three-Kings' Day (Dreikönigstag), companies assemble to spend a few hours in mirthful relaxation. A large cake is baked with a bean in it and divided among the guests, each person present receiving a piece, and whoever obtains the one with the bean is king for the year. In this capacity he holds a mock court, and receives the homage of the company, who also amuse themselves with other diversions. The bean-king is compelled to pay for his dignity by giving an entertainment on the next Twelfth-Night, that an opportunity may be afforded to choose another king.

BEAR–BAITING, a barbarous sport, formerly permitted in several countries, in which bears were baited by dogs. Queen Elizabeth, according to narration, herself witnessed these rude exhibitions. The sport was prohibited in England by act of Parliament in 1835. *Bear garden* was the term applied to any place where bears

were kept and publicly baited. See BEAR, Vol. III, p. 461.

BEARBERRY, a name somewhat loosely applied to several shrubs. The common or red bearberry (*Arctostaphylos uva-ursi*), also called bear's-grape, bear's-bilberry and foxberry, is the "kinnikinic" of the American Indian, and is much used in medicine as an astringent tonic, under the name of *uva-ursi*. The black bearberry (*Arctostaphylos alpina*) is a dwarf arctic-alpine trailing shrub, with black berries which are sometimes eaten. A species of *Rhamnus* (*R. Purshiana*), known as bearberry and bearwood, from the fondness of bears for its berries, yields the *cascara sagrada* bark, used as a tonic aperient.

BEARD, CHARLES, Unitarian minister; born in Manchester, England, July 27, 1827; died in Liverpool, England, March 9, 1888; was educated in Manchester and at Berlin, and subsequently settled in Liverpool; founded the *Theological Review* (1864); and delivered the Hibbert lectures in 1882. Among his published works are *Port Royal: A Contribution to the History of Religion and Literature in France* (1861); *The Soul's Way to God*, (1875); and *Martin Luther*, a posthumous publication.

BEARD, GEORGE MILLER, a physician; born at Montville, Connecticut, May 8, 1839; died in New York, Jan. 23, 1883. He studied at Phillips Academy, Andover, and Yale College. In 1865, after over a year of experience as assistant surgeon on the gunboat *New London*, he settled in New York and directed his attention to nervous diseases. Among his works are *General Electrization; Stimulants and Narcotics; Eating and Drinking; Clinical Researches in Electrical Surgery; Legal Responsibility in Old Age; Hay Fever; Physiology of Mind-Reading; Problems of Insanity;* and *Inebriety and Allied Nervous Diseases of America.*

BEARD, JAMES HENRY, an American painter, brother of William H., noticed below; born in Buffalo, New York, in 1814; member of the National Academy of Design in 1872; died in Flushing, Long Island, April 4, 1893; settled in Cincinnati, Ohio, and painted portraits, among them excellent ones of Presidents J. Q. Adams, W. H. Harrison and Taylor; a founder of the Century Club, New York; moved permanently to that city in 1870; eventually confined himself to animal painting in the style of his brother. Among his best canvases are *The Land Speculator; The Carolina Emigrants; Poor Relations*, a picture of dogs; *The Attorney and His Clients; Our Mutual Friend; Out All Night; Blood Will Tell; Don Quixote and Sancho Panza; My Easter's all Spoilt;* and *The Detected Poacher.*

BEARD, RICHARD, a Cumberland Presbyterian clergyman; born in Cumberland County, Tennessee, Nov. 27, 1799; graduated at Cumberland College, Kentucky, in 1832, and was president of that institution from 1843 to 1853. From 1854 he was professor of systematic theology at Cumberland University, Lebanon, Tennessee, where he died, Dec. 2, 1880. His principal books are *Systematic Theology* and *Why am I a Cumberland Presbyterian?*

BEARD, WILLIAM HOLBROOK, an American artist; born at Painesville, Ohio, April 13, 1825. He devoted himself at first to portrait-painting, and visited Europe, where he pursued his art studies. Returning, he settled in New York City, and painted pictures of animals, which he treated in allegorical style. His success in portraying human expressions on animal faces, and in the delightful drollery of his work, brought him commissions of that character, and fixed his line of painting, against his choice. Some of his paintings are *Kittens and Guinea Pig; Bears on a Bender; Raining Cats and Dogs; March of Silenus; The Wreckers; A Runaway Match; Voices of the Night,* and *Who's Afraid?* A collection of his sketches, entitled *Humor in Animals*, was published in 1885. He had four sons, all of whom are clever artists. The best-known is Frank, the third son, who was in the employ of Harper and Brothers during the war. He lectures, and at the same time illustrates his subjects with free-hand sketches. He has published a book entitled *The Blackboard and the Sunday School.* In 1862 he became a member of the National Academy of Design.

BEARDSLEY, AUBREY, an English book-illustrator, was born in Brighton in 1873. He was a musical prodigy in infancy, and at seven years of age performed in concerts. Educated at the Brighton grammar school, he went to London at sixteen, first as an architect's and then as an insurance office clerk; studied art at the suggestion of Sir Edward Burne-Jones and evinced much mastery of line-drawing; illustrated an edition of *Morte d'Arthur* and of Wilde's *Salome*, gaining by the latter more criticism than sound renown; first art editor of the *Yellow Book* in 1894; originated the style of posters which came rapidly into wide vogue for the decoration of magazine covers and for use in advertisements.

BEARDSLEY, EBEN EDWARDS, an Episcopal clergyman, born in Stepney, Connecticut, 1807; died in New Haven, Connecticut, Dec. 22, 1891; graduated at Washington (now Trinity) College, Hartford, 1832; ordained to the priesthood in 1836; for over forty years rector of St. Thomas's Church, New Haven. Dr. Beardsley was a conspicuous figure in the general conventions of his church. Among his works are a *History of the Church in Connecticut* (1865) and a *Life of Bishop Seabury* (1881).

BEARDSTOWN, a city of Cass County, west-central Illinois; one of the oldest places in the state; is situated on the left bank of the Illinois River, about 50 miles W. of Springfield. The waters of the Lithia Springs here are noted for their medicinal virtues. The city has railroad-shops, manufactories of machinery, iron, flour, woolen and lumber, and is a junction station of several railroads. A fine iron bridge spans the river at this point. Population 1880, 3,135; 1890, 4,226.

BEAR RIVER, a remarkable and geologically interesting stream which rises in the northwest

slope of the Uintah Mountains, in Summit County, northern Utah, and runs north and northwest to the northern extremity of Bear Lake, in southeastern Idaho; thence northwesterly to Soda Springs, on the Union Pacific railway; thence southerly along the western slope of Bear River range into Cache and Box Elder counties of northern Utah, emptying itself into Bear River Bay, in the northeastern part of Great Salt Lake; length, about 400 miles. See two articles in Vol. XLIII of the *American Journal of Science* (third series) concerning the Bear River and its stratigraphic position.

BEARS AND BULLS. See BULLS AND BEARS, in these Supplements.

BEARING THE BELL, a phrase which signifies to take the lead or first place in anything, or to carry away the prize. This old colloquial phrase is said to have originated in a practice, at the early part of the seventeenth century, of giving a small golden or silver bell as a prize to the winner at horse-races.

BEAS, a river of northern India, the ancient Hyphasis (Vedic, Vipâçâ); one of the five rivers of the Punjab; rises in the Snowy Mountains, 13,320 feet above sea-level; and flows through the Kangra Valley to the plains of the Punjab, where it empties into the Sutlej, 35 miles S.S.E. from Amritsa. It has great width, considerable volume, and at certain seasons the rapidity of a torrent. It is nearly 350 miles long.

BEAST-FABLES, a name given to the tales that have existed from the most ancient times among all races, wherein animals are made to assume human or superhuman actions, virtues or foibles. See FABLE, Vol. VIII, p. 837. Their origin, while a matter of much dispute, is probably traceable to the univeral totemism of aboriginal tribes. See TOTEMISM, Vol. XXIII, pp. 467 et seq.

BEATIFICATION, an inferior or preliminary step toward canonization, introduced in the twelfth century, is a solemn process in the Catholic Church, by which the Pope, after the virtues and miracles of a deceased person have endured a prolonged and involved scrutiny, pronounces him to be among the blessed. After this his cultus is authorized, not universally, as in canonization, but in some district or order of the church, nor can mass be said or the breviary recited in his honor. See CANONIZATION, Vol. V, p. 23.

BEATIFIC VISION, the direct vision of God, constituting the essential bliss of angels and of glorified saints, is, in respect of the latter, put by the Greek Church, and by most Protestants, after the day of judgment. The Council of Florence and the Council of Trent, however, declared that "the souls of those who have remained pure and spotless after baptism, and of those whose sins after baptism have been pardoned, either in this life or in the next, are immediately received into heaven."

BEATING THE BOUNDS, an ancient custom of the English Church, whereby the clergy, parish officers and the congregation perambulated their parishes annually on one of the rogation days immediately preceding ascension day, with the twofold object of supplicating the divine blessing on the fruits of the earth, and of preserving in all classes of the community a correct knowledge of and respect for the boundaries of individual and parochial property. The custom may have had its origin in the ancient Roman festivals of *Terminalia* and *Ambarvalia*. Some objectionable features of hilarity and coarseness attended these perambulations, and after the Reformation the observance was greatly curtailed and simplified, until at the present time the custom has fallen into general, but not universal, disuse.

BEATRICE, a city, the capital of Gage County, southeastern Nebraska, is on the banks of Big Blue River, 90 miles S.W. from Omaha, in the center of a very fertile region. It is an important junction-point of the Union Pacific, Rock Island, Burlington and Missouri River and other railroads. The city is regularly laid out, handsomely built, well lighted, and amply provided with water-works (Holly), street-car lines, telegraph and telephone systems, etc. The public buildings are substantial, and built with much architectural taste. The courthouse is a fine stone structure of four stories, with a tower 120 feet high. The city hall is a solid and commodious building. Other fine buildings are those of the Nebraska National Bank, Beatrice National Bank, Masonic Temple, Nebraska Institution for Feeble-Minded Youths, and the high school. There are six banks, five public schools, an excellent business college, and a large free circulating library. The fire department is ample and efficient. Beatrice is noted for quarries of magnesian limestone, used as a building material. The river furnishes a fine water-power. The principal manufactures are cement, flour and lumber. Population 1880, 2,447; 1890, 13,836.

BEATTY, JOHN, an American soldier and author, born near Sandusky, Ohio, Sept. 16, 1828; participated in many of the battles of the war of the Rebellion, rising from the ranks to be brigadier-general. He has been several times a member of Congress, and in 1884 was a presidential elector. Among his works are *The Citizen Soldier* (1876) and *Belle of Becket's Lane* (1882).

BEATTYVILLE, a town, capital of Lee County, east-central Kentucky, is situated at the confluence of the three forks of the Kentucky River, some 60 miles E.S.E. from Lexington. Population 1890, precinct, 1,616.

BEAUCLERC, TOPHAM, an intimate friend of Samuel Johnson, and grandson of the first Duke of St. Albans; born in 1739; died in 1780. In 1768 he married Diana, daughter of the Duke of Marlborough, and divorced wife of Lord Bolingbroke.

BEAUFORT, HENRY, CARDINAL, half-brother of King Henry IV of England, was born in 1377; made Bishop of Lincoln in 1397; translated to the rich see of Winchester in 1404; made Cardinal of St. Eusebius in 1426, and four times became Lord Chancellor of England. The most promi-

nent feature of his life, and of England's history during his career, was his fierce personal contest for supremacy with Humphrey, duke of Gloucester, the uncle of King Henry VI, who was Beaufort's competitor for power in England and for the popedom of Rome. In 1422, on the death of King Henry V, Beaufort was chosen by Parliament to be one of the guardians of the infant prince, his grand-nephew, whom in 1431 he crowned in the great Church of Paris as King Henry VI of England. He died April 11, 1447, after guiding the helm of state during a trying period of 20 years. His deathbed has been painted in immortal colors in Shakespeare's *King Henry VI*, pt. 2.

BEAUFORT, a town and port of entry, capital of Carteret County, in eastern North Carolina, is situated at the mouth of Newport River, 40 miles S.E. of Newbern. Its harbor, defended by Fort Macon, is the best in the state. The Cape Lookout lighthouse, 156 feet high, is 11 miles S.E. Population 1890, 2,007.

BEAUFORT, a town and port of entry, capital of Beaufort County, in southeastern South Carolina, is situated on Port Royal or Beaufort Island, on an arm of the sea called Port Royal River. There is an excellent harbor for vessels drawing 15 to 16 feet of water. The chief exports are lumber, rice, cotton and phosphate of lime. Population 1880, 2,549; 1890, 3,587.

BEAUFORT, West, an inland district of the west division of Cape Colony, South Africa, chiefly used for pasturage, its oxen being, in seasons of abundant rain, decidedly the fattest in the colony. Its area is about 13,050 square miles.—West Beaufort, its capital, is on the Gamka, 368 miles E. of Cape Town. Population about 3,000.

BEAUGENCY, an ancient town of north-central France, in the department of Loiret, situated on the right bank of the Loire, on the railway between Orleans and Tours, 15 miles S.W. of the former place. It was formerly surrounded by walls, flanked with towers and bastions, and defended by a strong castle, now ruined. In the histories of the wars of France it occupies a conspicuous place, having been successively in the hands of the Huns, Saxons, Normans and English; but it sustained the greatest damage during the religious wars of the sixteenth century. It has manufactories of woolens, leather, etc., and an extensive trade in wine, wool and corn. Population, 5,000.

BEAUHARNOIS, a town, capital of Beauharnois County, Southern Quebec, Canada, 20 miles S.W. from Montreal. It is reached by a branch of the Grand Trunk railway from Ste. Martine station, and is situated at the southwest end of Lake St. Louis, which is an expansion of the St. Lawrence River. Population, 1,500.

BEAUJOLAIS, a district of east-central France, is a subdivision of the old province of Lyonnaise, and is noted for its fine vineyards and choice Beaujolais wine. Population 1872, 302,000; 1891, 438,000.

BEAULIEU, a village of Hampshire, in the south of England, near Lymington, on the verge of the New Forest. It is the site of a Cistercian abbey, founded by King John in 1204, and has a number of interesting ruins and historical associations. Population, 1,177.

BEAUMONT, a city, the capital of Jefferson County, southeastern Texas, is situated at the head of tidewater navigation on the Neches River, and has a large trade in yellow pine and cypress lumber and shingles, which are manufactured here and shipped by water via Sabine Pass. Population 1880, precinct, 2,392; 1890, city, 3,296.

BEAUMONT, Francis. See Beaumont and Fletcher, Vol. III, p. 469.

BEAUMONT, Jean Baptiste Armand Louis Léonce Élie de. See Élie de Beaumont, in these Supplements.

BEAUMONT, William, born at Lebanon, Connecticut, 1796; died at St. Louis, Missouri, April 25, 1853. While United States surgeon at Mackinac, in Michigan, he was called to attend Alexis St. Martin, who had been shot in the side. The wound healed, but an opening in the stomach remained, through which Dr. Beaumont was able to watch the process of digestion. The results of his investigations were published under the title of *Experiments and Observations on the Gastric Juice and Physiology of Digestion* (1833), and were reprinted, with notes by Dr. Andrew Combe (London, 1838, and subsequently), and proved a valuable addition to physiological knowledge.

BEAUMONT DE LA BONNIERE, Gustave Auguste de, a French advocate and publicist; born in Sarthe, February, 1802; died at Tours, April 2, 1866. Both he and the lady whom, in 1836, he married, were grandchildren of Lafayette. He became a member of the Chamber of Deputies in 1840; of the National Assembly in 1848, and in 1851 he was imprisoned for his opposition to the *coup d'état* of December. The works by which he is best known in America are *Marie; or Slavery in the United States* (1835); and *The Penitentiary System of the United States* (1832), both founded upon personal observations during a visit to this country, in company with M. de Tocqueville, in 1831; and *Ireland, Political, Social and Religious* (1839).

BEAUNE, Florimond de, an eminent French mathematician; born at Blois in 1601; died in his native town in 1652. He was a friend of Descartes, whose work he much improved, and is regarded by many as the proper founder of the integral calculus. Two volumes on the *Limits of Equations* are his only known works.

BEAUPORT, a town of Canada, on the left bank of the St. Lawrence River, 3½ miles below Quebec. It contains manufactories of lumber, nails, flour, chemical products and agricultural implements. The lunatic asylum here located is the oldest in the province, having been established in 1845. Population 1891, 4,800.

BEAURAIN, Jean de, a French engineer and geographer; born at Aix-en-Essart in 1696; died in 1771; studied under Pierre Moulard-Sanson, and was made "Geographer to the King." He pub-

lished a *Topographic Description of Flanders; or, Campaigns of Marshal Luxembourg* (1756); also, an *Atlas of Ancient and Modern Geography* (14 vols., fol.) His son, bearing his name, was also an engineer and geographer, and published *Maps for the History of the Campaign of Prince Condé in Flanders;* and *Maps for the History of the Four Last Campaigns of Marshal Turenne.*

BEAUREGARD, Pierre Gustave Toutant de, Confederate soldier; born near New Orleans, Louisiana, of an aristocratic Louisiana family of Canadian French origin, May 28, 1818; graduated at West Point in 1838; second in a class which included the future Union generals, Irvin McDowell and William F. Barry; entered the army as second lieutenant of engineers and served through the Mexican War with high distinction, becoming a captain and brevet major in 1847; rose to be superintendent of the United States Military Academy, with the rank of colonel, in 1860; resigned from the United States army to enter the service of the Confederate States, in 1861, as brigadier-general; he commanded the bombardment of Fort Sumter in April and gained the battle of Bull Run in July of that year, for which victory he was made general, and in 1862 assumed control of the Confederate army in the West after its defeat at Shiloh and the death of General Albert Sidney Johnston. He also conducted the defense of Charleston, South Carolina, from September, 1862, until April, 1864. In May, 1864, he reinforced General Lee near Richmond and defeated Gen. B. F. Butler at Drury's Bluff. At the close of the war he surrendered his command to General Sherman at Greensboro, North Carolina, in April, 1865, and returning to New Orleans served as president of the New Orleans and Jackson Railroad Company until 1870, declining in the years 1866 and 1869, respectively, the proffered commands of the Rumanian and the Egyptian armies. In 1878 he was made adjutant-general of Louisiana, and in 1888 commissioner of public works of the city of New Orleans. During the later years of his life he consented to receive a large salary from the Louisiana Lottery Company for the use of his name as one of the managers of that unsavory enterprise and for his personal services in superintending its monthly "drawings." He died at New Orleans, Feb. 20, 1893.



GENERAL BEAUREGARD.

BEAVER, American, The. See Beaver, Vol. III, p. 475.

BEAVER, a borough, capital of Beaver County, west-central Pennsylvania, is situated on the Ohio River, about 25 miles N.W. of Allegheny and 2 miles below the mouth of Beaver River. It has water-power and a flow of natural gas, and is the seat of Beaver Collegiate and Musical Institute, an academy and other excellent schools. Population 1880, 1,178; 1890, 1,552.

BEAVER, a city, capital of Beaver County, southwestern Utah; situated on Beaver River, about 200 miles S. of Salt Lake City. Lead and copper are found in the neighborhood, and there are manufactories of leather and woolens. Population 1890, 1,752.

BEAVER, James Addams, a descendant of a famous Huguenot family; born at Millerstown, Perry County, Pennsylvania, Oct. 21, 1837; graduated at Jefferson College, and afterward practiced law at Bellefonte. In 1861 he responded to the call of President Lincoln for volunteers; was soon made lieutenant-colonel; was wounded at Chancellorsville and was present at Gettysburg, but unable to take an active part on account of physical weakness. He was in the Wilderness campaign, and was again wounded at Cold Harbor. At Petersburg he was injured, but returned to the battlefield of Ream's Station in an ambulance, and just as he had resumed command his right leg was shattered by a rifle-ball, and the necessary amputation incapacitated him for further service. He afterward entered political life and became a popular Republican campaign speaker. He has been trustee of the Pennsylvania State College, and was governor of the state for the four years ending January, 1891.

BEAVER BAY, a city and lake port, capital of Lake County, northeastern Minnesota, situated on the north shore of Lake Superior, about 50 miles N.E. of Duluth. Population 1880, township, 106; 1890, 75.

BEAVER CITY, a town of Furnas County, southern Nebraska, situated on the Burlington railroad, 50 miles S.W. of Plum Creek. Population 1880, 153; 1890, 763.

BEAVER DAM, a city of Dodge County, southeastern Wisconsin, situated on Beaver Dam Creek, at the southeastern extremity of Beaver Lake, about 60 miles N.W. of Milwaukee. Its situation on the banks of this beautiful lake makes it a favorite summer resort. It has excellent water-power, and manufactories of woolens, flour, carriages and agricultural implements. Population 1880, 3,416; 1890, 4,222.

BEAVER FALLS, a borough of Beaver County, west-central Pennsylvania, situated on Beaver River, about 30 miles N.W. from Pittsburg. It has an excellent water-power and an abundant supply of natural gas, utilized in manufactures of iron, machinery, flour, cars, cutlery, fence-wire, stoves and farming utensils. It is also the seat of Geneva College. Population 1880, 5,100; 1890, 5,735.

BEAVER ISLANDS, a group of islands in the northern part of Lake Michigan, which, with Manitou Island, Fox Island and others, form Manitou County, Michigan. The largest is Beaver Island. Garden Island, High Island and Hog Island, of this group, are next in size. St. James, at the northern end of Beaver Island, is the only town. A colony of Mormons settled there in

1846, under the leadership of Joseph Strong. Population 1890, county, 860.

BEAVER MINE. See SILVER AND SILVER-MINING, in these Supplements.

BEBEERINE. See BIBIRINE, Vol. III, p. 633.

BEBEL, FERDINAND AUGUST, German socialist leader; born at Cologne, Feb. 22, 1840. He was a turner by trade, and traveled as an apprentice through Austria and South Germany. Although at first an opponent of social democratic ideas, he became, in 1869, their active propagandist, and underwent imprisonment for "spreading opinions dangerous to the state." In 1872 he was again imprisoned for being too free in his criticisms of royalty. On his release he was elected to the Reichstag, and has sat there since as the frank exponent of socialistic doctrines. His literary works include *Christianity and Socialism; The German Peasant War; Women in the Past, Present and Future;* and others.

BEBEL, HEINRICH, a German scholar and poet; born at Ingstetten, Württemberg, 1472; died, 1518, at Tübingen, where he had been professor of rhetoric and poesy since 1497. He was a friend of Erasmus, and in 1501 was crowned poet laureate by the Emperor Maximilian, having written numerous poems, most of them in praise of the Emperor. His best known work was a collection of anecdotes and witticisms, entitled *Facetiæ*, published in 1506.

BECCAFICO, a name popularly given to several small European birds, but usually to a bird common in Italy, known as the garden-warbler, and belonging to the family *Sylviidæ*. The Italians considered them great delicacies as food. The name signifies fig-pecker.

BECCAMOSCHINO (*Sylvia cisticola*), a small Italian bird of the warbler family (*Sylviidæ*). It builds a nest resembling that of the tailor-birds.

BECHMAN, GEORGES, a French engineer and hydrographer; born in Paris, Jan. 1, 1848; graduate of the Polytechnic School and of the School of Bridges and Roads; has a professional reputation for eminent skill and experience in all questions relating to water-supply and sewage, but is best known to the general public as designer of the illuminated fountains in the Champ-de-Mars during the Paris exposition of 1889. Member of a number of learned societies, and an officer of the Legion of Honor.

BECHUANALAND, a former crown colony of Great Britain, in South Africa, which was annexed to Cape Colony in 1895. It is situated south of the southern boundary of the Bechuanaland protectorate (q.v.) and included all the territory between that line and the original northern line of Cape Colony. Its area was 60,770 square miles, with a population (1891) of 60,376; of whom 5,000 were whites, the rest natives. The climate is healthful, but portions of the land are waterless. Corn, wool, hides, cattle and wood are the principal exports, and go mostly to the Kimberley market. Gold, lead, silver and iron have been found. The chief towns are Mafeking and Vryburg, which last was the capital before annexation. The railway and telegraph lines from Cape Colony to Kimberley have been extended northward via Vryburg and Mafeking, and will ultimately cross the protectorate and Khama's kingdom into Matabeleland.

In 1893–94 the local revenue was £55,370, and the Parliamentary grant, £162,500; against expenditures £237,928; but prior to 1892 the revenue and grant together exceeded the expenditures by about £2,000 per annum.

For the early history of the country and natives, see BECHWANA, Vol. III, p. 478; and AFRICA, in these Supplements.

BECHUANALAND PROTECTORATE is the official name given by the British government to the territory lying between the Molopo River on the south (which now forms the northern boundary of Cape Colony), and the Zambezi River on the north, and extending from the boundaries of the South African Republic and Matabeleland on the east to the confines of German Southwest Africa. The total area is about 386,000 square miles. In July, 1890, this territory was placed under the jurisdiction of the governor of British Bechuanaland; but in November, 1895, on the annexation of that colony to Cape Colony, new arrangements were made for the administration of the protectorate. The British South Africa Company, whose railway lines already extended from Kimberley to Vryburg (126 miles) and from Vryburg to Mafeking (100 miles), desired to build northward from the last-named place to Gaberones, and thence to Palapye, the capital of King Khama's country, and beyond, and a strip of land about 100 miles in length, running from the Molopo River along the frontier of the Transvaal, and occupied by people of the chiefs Montsoia and Ikaneng, was, with the assent of those chiefs, placed under the administration of the company. It was also agreed that north of this a strip not over ten miles wide should be marked out for the purposes of the railway. The boundaries of the tribes under this new arrangement being established, it was agreed that the several chiefs should rule their own people as before, under the protection of the Queen, who appoints an officer to reside among them, with his assistants, subject to the High Commissioner. The natives pay a hut-tax, to be collected by the chief; no licenses for the sale of spirits are granted; there is a mounted police for the maintenance of order; and, outside of the boundaries laid down for the chiefs, the British South Africa Company administers the government. The natives in the country are peaceable, and their chief industries are agriculture and cattle-raising. The telegraph system has been extended from Mafeking to Fort Salisbury, in Mashonaland, a distance of over 800 miles.

BECK, CHARLES, born in Germany in 1798; died in 1866; was a philologist; professor of Latin and literature in 1882 at Cambridge, Massachusetts. He published several works, among which was *The Manuscripts of the Satyricon of Petronius Arbiter Described and Collated.*

BECK, JOHANN TOBIAS, a German theologian;

born at Balingen, Württemberg, Feb. 25, 1804; died there, Dec. 28, 1878. The scene of his labors was Tübingen, where, as professor of theology for many years, he combated the negative criticism of the "Tübingen school" of Bauer; not so much, however, by direct controversy as by the development of a system of biblical divinity founded upon faith in the text.

BECK, KARL, a German poet; born at Baja, Hungary, in 1817, the son of an Israelite merchant of Budapest; studied medicine at Vienna and philosophy at Leipsic, but his heart was absorbed in poetry. Although he wrote in German, his native land of Hungary was ever present in his mind, and he participated in the uprising of 1848. His poems are remarkable for vigor, grace and originality, but have a certain touch of exaggeration and excess of emphasis. Among them are *The Nights* (1838); *The Wandering Poet* (1838); *Songs of Peace* (1839); *Songs of a Poor Man* (1846); *Saul*, a tragedy; and *Mater Dolorosa*, a romance (1854).

BECK, THEODORE ROMEYN, physician; born in Schenectady, New York, April 11, 1791; died in Utica, New York, Nov. 18, 1855. His parents were English. Dr. Beck was graduated at Union in 1807, and afterward went through a medical course at the College of Physicians and Surgeons in New York City. He began to practice in Albany in 1811. He was appointed professor of the institutes of medicine and lecturer on medical jurisprudence in the College of Physicians and Surgeons of Western New York, and in 1817 was chosen principal of the Albany Academy, where he officiated until 1848. From 1826 until 1836 he was professor of materia medica at the college in Fairfield, and in the Albany Medical College from 1840 to 1854. In 1829 he was president of the New York State Medical Society; became a manager of the state lunatic asylum, and in 1854 president of the board of managers. From 1849 to 1853 he edited the *American Journal of Insanity*. He contributed various articles to scientific journals. His work, the *Elements of Medical Jurisprudence*, written in connection with his brother John, has been renewed in ten editions.

BECKER GEORGES, a French painter, pupil of Gérôme; born in Paris about 1845; has exhibited a number of striking pictures, among them *In the Catacombs* (1868); *Orestes and the Furies* (1870); *The Martyr's Widow* (1872); and a very large one, *Rizpah Defending the Bodies of her Children from the Birds of Prey*, exhibited at the Centennial Exposition at Philadelphia in 1876. He has also been successful as a portrait-painter, and in later years has made Russia his home. He received the decoration of the Legion of Honor at the Universal Exposition of 1889.

BECKER, GOTTFRIED WILHELM, a German author; born at Leipsic, 1778; died there, Jan. 17, 1854; commenced his career as a practicing physician and writer of medical works in 1801. From the year 1832 he devoted himself wholly to literature. He was a popular and prolific writer of light literature, entertaining books of travel, and works relating to modern history.

BECKER, KARL, a German historical painter; born at Berlin, Dec. 18, 1820; became a pupil of Kloeber, and in 1842 laureate of the Berlin Academy. His rise to fame was rapid, and his subjects appear to be chosen with a view to gaudy coloring, striking draperies and intricate architectural combinations. Among them are *Charles V at the House of Fugger*, and *The Inquisition*.

BECKER, KARL FERDINAND, a German organist and writer of music; born at Leipsic, July 17, 1804; first appeared before the public, in concerts, when 14 years old. He may be named with Kiesewetter and Winterfeld as one of the best German writers on the history of music, and also as an excellent composer for the organ, as is proved by his trios and other compositions, well adapted to the genius of the instrument. Among his works may be mentioned a *Choral Book*, or collection of psalm and hymn tunes; a catalogue of his musical library, one of the most extensive in Germany; *The Composers of the Nineteenth Century*, etc. He died Oct. 26, 1877.

BECKERATH, HERMANN VON, statesman; born in Krefeld, Rhenish Prussia, Dec. 13, 1801; died there, May 12, 1870; was a prominent figure in Prussian politics until 1852, and devoted himself, after the accession of Frederick William IV, to the cause of constitutional freedom and German unity. In 1843 he was elected representative of his native town in the provincial diet. In 1848 he was appointed Minister of Finance.

BECKWITH, JAMES CARROLL, an American artist; born at Hannibal, Missouri, Sept. 23, 1852. Studied in Chicago and New York, 1869–72, then at the School of Fine Arts in Paris, whence he returned to the United States in 1878. He has since resided in New York, and is well known as a portrait-painter of merit and as a frequent exhibiter of striking *genre* pictures.

BECQUEREL, ANTOINE CÆSAR, a French soldier and savant; born at Châtillon-sur-Loing, Loiret, March 7, 1788; died Jan. 19, 1878. He was educated at the Polytechnic School; chose a military career in the engineers, and won a brilliant reputation in active service, chiefly in Spain, from 1808 until the downfall of Napoleon in 1815. He afterward devoted himself to the study of electricity and electro-chemistry, and made a series of discoveries which have given him equal rank with Ampère and Arago, among which were the disproving of Volta's theory of simple contact; the construction of a constant pile; a method of learning the internal temperature of the animal body; and the fact that upon the contraction of a muscle heat is developed. In connection with his second son, Alexandre Edmond, born in Paris, March 24, 1820, who was eminent in heliochromic discovery, and who may well be called his scientific heir, he made valuable researches concerning the solar spectrum and the electric light. He was the author of several hundred publications of a scientific nature, and it has been

said of him that there is scarcely a chapter in the history of electricity which he did not either enlarge or create anew. He was a member of the Academy of Sciences, grand commander of the Legion of Honor, and held other distinctions of similar nature.

BECSE, the name of two towns of Hungary, on opposite sides of the river Theiss, known as Old Becse and New Becse. They are situated about eight miles apart, 50 miles S. of Szegedin. Population, Old Becse, 17,000; New Becse, 7,000.

BECSKEREK NAGY OR GREAT BECSKEREK, a town of Hungary, in the county of Torontal, situated on the left bank of Bega, about 45 miles S.W. of Temesvar, with which place it is connected by a canal. It is an important market town. Population 19,700.

BED, an article of household furniture on which to sleep. Beds are, and always have been, of various styles, nearly all countries having their own peculiar form. As far as has been ascertained, the people of ancient Palestine had a simple sort of couch suitable for resting on during the day, or sleeping on at night, being easily moved. In the European countries the bed is of an open couch form, usually accommodating but one person. It is composed of a frame or bedstead (see FURNITURE, Vol. IX, p. 849), upon which are placed one or two mattresses of hair or wool, or some cheaper materials, such as excelsior or cotton; curtains, which hang from the ceiling, often accompany it. The Germans frequently lay a large flat mattress of down above the other covering, for the sake of warmth. The beds chiefly used in America resemble those of Europe, and consist of a mattress supported by springs and kept above the floor by the bedstead. "Folding-beds" are also used in America and are adapted to the economy of space in small apartments. They are, simply, ordinary beds so arranged that when not in use they may be set upon end and concealed by a neat case having the appearance of a bureau or other article of furniture.

BED OR STRATUM, in geology, is a layer of sedimentary rock of similar composition. See GEOLOGY, Vol. X, pp. 292, 325.

BEDCHAMBER, LORDS OF THE, are twelve officers in the royal household of Great Britain, who wait in turn upon the king's person. They are under the groom of the stole, who accompanies the sovereign only on state occasions. There are also 13 grooms of the bedchamber, who attend in turn. In the reign of a queen, ladies fill these offices, which are objects of high ambition. See ROYAL HOUSEHOLD, Vol. XXI, p. 37.

BEDDOE, JOHN, an English physician, especially distinguished for his acquirements in ethnology, anthropology and statistics; born at Bewdley, Worcestershire, Sept. 21, 1826; studied at Edinburgh and Vienna, and was attached to the general staff during the Crimean War; subsequently he practiced his profession at Clifton and at Bristol. He was a member of the Royal Society and of the Royal College of Physicians, and in 1869–70 president of the Anthropological Society. He sought to apply the numerical method to the study of anthropology, and published, among other writings, *On the Stature and Proportions of Man in the British Islands* and *The Progress of Public Health in the British Islands.*

BEDEAU, MARIE ALPHONSE, a French general; born at Vertou, near Nantes, Aug. 10, 1804; entered the military school in 1817, and received a commission in the army in 1825; served as aid to General Gerard in the Belgian campaign of 1831-32; commanded a battalion in Algeria in 1836, and became governor there in 1847. He was appointed minister of war by the provisional government in 1848, and afterward was intrusted with the command of the city of Paris. As a Republican member of the National Assembly he opposed Louis Napoleon; was arrested with Cavaignac in 1851; imprisoned in the fortress of Ham, and afterward exiled to Belgium. After the amnesty of 1859 he returned to his native city, where he died, Oct. 30, 1863.

BEDEGUAR OR BEDEGAR, a gall or excrescence which certain gall-insects of the genus *Rhodites* produce on the branches of roses and sweet-briers by depositing their eggs beneath the bark. The irritation thus set up causes an abnormal growth of the vegetable cells. The bedeguar gall was formerly used as medicine. See GALL, Vol. X, p. 44; INSECTS, Vol. XIII, p. 143.

BEDELL, GREGORY THURSTON, an American bishop; born at Hudson, New York, Aug. 27, 1817; died in New York City, March 11, 1892. His father was a clergyman, and the son, after graduating at Bristol College, Pennsylvania, and at the Virginia Theological Seminary, became rector of Trinity Church, West Chester, Pennsylvania, 1841, and of the Church of the Ascension, New York City, 1843. In 1859 he was consecrated assistant bishop of Ohio, and in 1873 he succeeded to the bishopric of that diocese on the death of Bishop McIlvaine. He published several volumes of sermons and addresses, with other works, the chief of which are *The Pastor: A Text-Book on Pastoral Theology; Episcopacy; Fact and Law; A Canterbury Pilgrimage;* and *The Divinity of Christ.*

BEDELL, GREGORY TOWNSEND, an American clergyman; born on Staten Island, New York, Oct. 28, 1793; died at Baltimore, Maryland, Aug. 30, 1834; was educated at the Episcopal Academy, in Cheshire, Connecticut, and at Columbia College. He became rector of an Episcopal church at Hudson, New York, and subsequently at Fayetteville, North Carolina, and at Philadelphia, Pennsylvania, where St. Andrew's Church was established through his efforts. He was the author of *Renunciation* and other religious works, and of several musical compositions, of which the best known is, *Is It Well? It Is Well!*

BEDFORD, a town, the capital of Lawrence County, southern Indiana, is the seat of an academy and of the Bedford Male and Female College. It has manufactures of wool and lumber. At Bluff Ridge, 4 miles N.W., are the quarries of the famous Bedford stone, an oölitic limestone of handsome color, remarkable for strength, beauty,

durability and evenness of texture, and in great demand for buildings in large cities. Population 1880, 2,198; 1890, 3,351.

BEDFORD, a town, capital of Taylor County, southwestern Iowa, is situated on the One-Hundred-and-Two River, about 100 miles S.W. from Des Moines, in a fertile agricultural district. Population 1880, 1,763; 1890, 1,643.

BEDFORD, a borough, capital of Bedford County, Pennsylvania, is situated on a branch of the Juniata River, about 100 miles W. from Harrisburg, and is on the Bedford division of the Pennsylvania railroad. It has manufactures of iron. Iron ore is found in the vicinity. The founding of the town dates from 1766, and in it are several historic houses of the Revolutionary period.—BEDFORD SPRINGS, a fashionable summer resort, noted for its mineral and medicinal springs and attractive surroundings, is one mile distant. Population 1880, 2,011; 1890, 2,242.

BEDFORD, GUNNING S., a physician; born in Baltimore, Maryland, 1806; died in New York City, Sept. 5, 1870; graduated with the highest honors at Mount St. Mary's College, Emmittsburg, in 1825, and at Rutger's Medical College in 1829, and completed his medical studies in Europe. In 1833 he became professor in the medical college at Charleston, South Carolina, and later at Albany, New York. Removing to New York City, he founded, in 1840, the University Medical College, wherein he was professor of obstetrics until 1862. As a writer upon obstetrics he was a recognized authority, and he was the first to introduce into the United States obstetrical clinics for the benefit of the poor.

BEDFORD CITY, a town, capital of Bedford County, southwestern Virginia, 25 miles W. by S. from Lynchburg, and known as Liberty Station. It has manufactures of woolens, tobacco, cigars, knit goods, agricultural implements, etc., and is the seat of St. John's Institute for Girls, the Jeter Female Institute, the Belmont Seminary for Young Ladies, and the Randolph Macon Academy, which are supported by the Episcopal, Baptist, Presbyterian and Methodist denominations respectively. Population 1880, 2,191; 1890, 2,897.

BEDLAM (corruption of Bethlehem), the name of a hospital for lunatics in London. It was originally founded by Simon Fitz-Mary, in 1246, "as a privy of canons for brethren and sisters." When the religious houses were suppressed by Henry VIII, it fell into the possession of the corporation of London in 1537, who converted it into an insane asylum. The present building, with its grounds, covers an area of 14 acres, and is lacking in nothing likely to insure the comfort and promote the recovery of patients. In former times the management was deplorable. The patients were exhibited to the public, like wild beasts in cages, at so much per head, and were made sport of by visitors. The funds not being sufficient to meet the expenditure, partially convalescent patients, with badges affixed to their arms, and known as "Bedlam Beggars," were turned out to wander and beg in the streets. This practice appears to have been stopped in 1675. Now the management of the patients is so excellent that annually many are returned as cured. See INSANITY, Vol. XIII, p. 110.

BEDLINGTON TERRIER, a dog so named from a village and parish of Northumberland, one of the districts in which the race has been extensively bred. This dog is highly esteemed for its sagacity and speed, and for its wonderful courage. It is a good water-dog, and has a marked dislike for all kinds of vermin; it will unflinchingly attack even the fox, the otter or the badger.

BEDLOE'S ISLAND, the site of Bartholdi's statue of *Liberty Enlightening the World*, is situated in New York harbor, within the limits of the city of New York. It was named from a former owner. It became in 1800 the property of the United States. In 1841 the government erected here a fort, known as Fort Wood, which mounted 77 guns. The fort is now disused, and the statue occupies nearly the whole of its interior. See BARTHOLDI, in these Supplements.



LIBERTY ENLIGHTENING THE WORLD.

BEDMAR, ALFONSO DE LA CUEVA, MARQUIS, DE, a Spanish archbishop and cardinal; born 1572; died Aug. 2, 1655; was ambassador to Venice from the Spanish court, 1607–18, and in the last named year entered into a bold and unscrupulous conspiracy to destroy that city. See VENICE, Vol. XXIV, p. 147. The plot of Otway's popular and pathetic play, *Venice Preserved*, is taken from this incident. Bedmar was afterward made president of the Council at Flanders, and by his severity while in that position drew upon himself the hatred of all classes. In 1622, on the demand of Spain, he was created cardinal by Pope Gregory XV. He subsequently visited Rome, and returned to Spain as Bishop of Oviedo.

BEDOS DE CELLES, DOM JEAN FRANÇOIS, a Benedictine monk, and famous organ-builder;

born at Caux, 1706; died at St. Maur, Nov. 25, 1779; was the most learned and practiced master of his art in the eighteenth century. His great work, *The Art of Building Organs*, was published in four large folio volumes, with 137 beautifully executed copper-plates, in 1766–78, at the request of the Academy of Sciences (of which he had become a member in 1758), and is still regarded as of great value. He also wrote an account of the new organ at St. Martin of Tours, which has been translated into German and published by Adelung.

BEDSTRAW, a common name applied to the species of *Galium*, a genus of plants belonging to the family *Rubiaceæ*, and distinguished by inconspicuous flowers and a dry two-lobed, often prickly fruit, each lobe containing a single seed. The leaves are whorled, and the minute flowers are either axillary or in terminal panicles. The name refers to the old practice of using these plants in beds, some of the species becoming sweet-scented upon drying.

BEDWIN, GREAT, a town of Wiltshire, in the south of England, on the Kennet and Avon canal, 69 miles W. by S. of London. A fierce but indecisive battle occurred here in 674 between the kings of Mercia and Wessex. St. Mary's Church was built in the beginning of the fourteenth century, and is constructed of flint, except the piers, arches and dressings, which are of freestone. Jane Seymour, one of the queens of Henry VIII, was born here. The remains of a Roman villa have been discovered here, having a tessellated pavement, a huge leaden cistern and a foundation for baths. Population, 2,068.

BEE INDUSTRY. For the general subject of bees and bee-culture in various countries, see BEE, Vol. III, pp. 484–503; HONEY, Vol. XII, p. 138.

BEE INDUSTRY IN THE UNITED STATES. Honey and beeswax are produced in every section of the country, and their aggregate value is very large. The latest official record of production by states is the return of the national census for the year 1889. It made the production of honey 63,897,327 pounds, and of wax 1,166,588 pounds. The best producing states in that year yielded as follows:

| States. | Honey. | Wax. |
|---|---|---|
| Iowa | 6,813,412 | 67,339 |
| Illinois | 4,602,941 | 50,420 |
| New York | 4,281,964 | 66,654 |
| Missouri | 4,492,178 | 75,670 |
| California | 3,929,889 | 60,237 |
| Wisconsin | 3,515,761 | 46,058 |
| Texas | 3,286,386 | 62,509 |
| Ohio | 2,894,059 | 33,520 |
| Michigan | 2,487,134 | 26,759 |
| Pennsylvania | 2,453,424 | 39,877 |
| North Carolina | 2,373,560 | 126,447 |
| Kentucky | 2,310,615 | 37,225 |
| Tennessee | 2,284,155 | 63,290 |
| Indiana | 2,106,817 | 24,864 |
| Alabama | 1,824,286 | 68,884 |
| Georgia | 1,757,758 | 49,935 |
| Virginia | 1,531,147 | 67,339 |
| West Virginia | 1,218,686 | 22,109 |
| Minnesota | 1,160,390 | 12,050 |
| Arkansas | 1,111,246 | 24,811 |
| All others | 7,461,519 | 163,816 |
| Total | 63,897,327 | 1,166,588 |

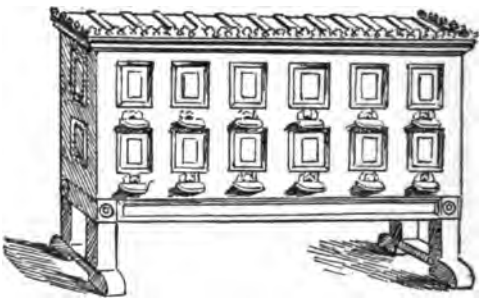
Under the head of "all others," in the above statement, is grouped the production of 29 states and territories, ranging from 890,913 pounds of honey in Nebraska to 20 pounds reported from Montana.

BEEHIVES AND BEEHOUSES. (See BEE, Vol. III, p. 499.) The accompanying cuts show a style much in use in countries of severe climates, especially in England and Scotland. They are covered with straw wrought in such manner as to combine beauty of finish with protection from cold.

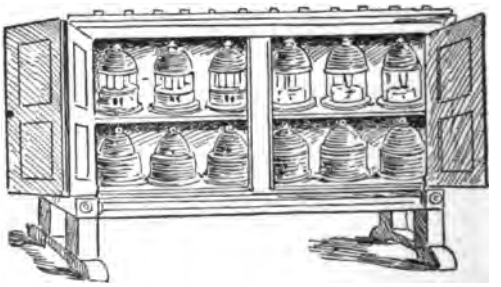
They can be made with or without supers, and so arranged as to be conveniently opened, carried or weighed. A sample of beehouse is also given, specially adapted to straw style of hive, but suggestive of other styles adapted to various kinds of hives. The front and rear views are both given, by which their method and convenience in use will be readily indicated.



BEEHOUSE.



BEEHOUSE FOR 12 HIVES — FRONT VIEW.

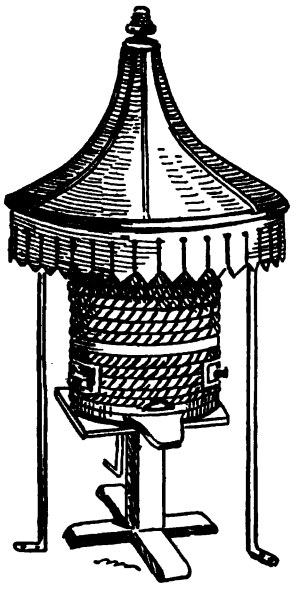


BEEHOUSE FOR 12 HIVES—BACK VIEW.

The annexed illustration shows the ornamental zinc cover, and renders but little description necessary. Three clamps of wood must be driven into the ground, and the three iron rods supporting the covering made fast to them with screws; there are screw-holes in the feet of the iron rods for the purpose. When thus secured, but little

fear need be entertained of its being blown over by high winds.

In the roof two pulleys are fixed, so that by attaching a cord the upper hive covering the bell-glass supers may be raised with facility for the purpose of observing the progress made by the bees.



MODERN BEEHIVE.

The ornamental zinc cover will form a pleasing object in the flower-garden when placed in a suitable position and neatly painted. Should the box style of hive be used, as is generally the case in most sections of the United States, a change in style of bee-house or cover will be at once suggested.

In olden times the invariable method of taking the honey was by allowing the bees to work at will in small straw skeps until the close of the season, when they were destroyed by sulphur fumes. This has almost everywhere now given place to a more humane method of management. The method usually adopted by advanced bee-keepers is what is known as "extracting." This method is only possible in the movable-comb hive. A box of dimensions equal to the body of the hive, and filled, like it, with bars, is placed above the bars. The quilt is removed and its place is taken by a sheet of "excluder-zinc," i.e., zinc with slits cut of sufficient width to let the worker bees pass freely, but effectually to bar the progress of the queen. The upper story is thus kept free from brood, and the honey got is pure. When this box is filled, it is removed and an empty one is put in its place. The capping of the cells is then cut off and the bars are put into a machine known as the "extractor." This is a large cylinder containing wirework cages that may be set in rapid rotary motion. The centrifugal force throws out the honey, and the empty combs are replaced in the hive to be again filled by the bees. By this method of working, the bees are saved the labor of comb-building, and large harvests of honey may be secured. As much as 400 pounds of surplus honey has been taken from a single hive in this way. Another method is to fill the upper story of the hive with boxes of thin wood, known as "sections," placed side by side. The sections are usually made to contain one or two pounds of honey, and are fitted, like the bars, with guides of comb-foundation. The advantage gained here over the old method of producing large supers is that the surplus chamber, like the hive, may be enlarged or contracted at will, while the sections may be removed as they are filled, and their place supplied by empty ones. The honey, too, is put upon the market in a form much more convenient for use.

BEEHIVE HOUSES. The beehive plan of construction is a primitive method of throwing a roof of dry-stone masonry over a chamber of the same. In building with hewn stones and mortar, a stone-roofed chamber would be vaulted, on the principle of the arch; but in primitive building, with undressed stones and without mortar, the method was adopted of setting inward each successive course of the upper part of the side walls, until the space to be spanned was so reduced that it could be covered in by a single stone, or by several stones laid lintelwise, side by side. This method of constructing a stone roof is found in many varieties of prehistoric structures. It is the usual style of roofing the chambers in the chambered cairns or barrows of Britain and Ireland, and as these have been shown by their contents to belong to the stone age, it is therefore the earliest method of constructing a roof of which there is evidence extant in the British Isles. It is also the usual style of the basement chambers of the brochs, or so-called "Pictish towers," of Scotland, which belong to the iron age. In the early Christian period many of the small churches and oratories of the Celtic Church in Scotland and Ireland were still constructed in the same primitive manner; and the dwellings of the monks in early Celtic monasteries have been termed "beehive houses," from their being almost invariably built of dry stone and roofed in this manner. In some districts of Ireland, as in Kerry, the remains of beehive houses, called by the country people *cloghauns*, are still abundant. They are not connected with ecclesiastical sites, but seem to have been the common dwellings of the inhabitants at some time probably not extremely remote, but now unknown. O'Flaherty, mentioning the *cloghauns* of West Connaught in 1684, describes them as buildings of stone, brought to a roof without any manner of mortar to cement them, some of which would hold 40 men on their floor, and which were so ancient that nobody knew how long ago any of them were made. In the Western Isles of Scotland there are many remains of beehive houses of quite recent date. Captain Thomas saw 40 or 50 in a limited area of the island of Lewis in 1857; and Dr. Mitchell records in 1880 that not less than from 20 to 30 were then inhabited. These, however, were not the permanent dwellings of the people, but the huts of their summer shielings, erected usually on grassy spots in the glens, to which they proceed with their cattle, and remain making butter and cheese in July and August, "during which time," says Captain Thomas, "they dwell in these circular stone-roofed houses called *bothan*, or in timber-roofed ones called *airidhena*." The *bothan* are seldom larger than 10 feet in diameter; a row of stones is placed across the interior for a seat, on one side of which is the fire and on the other the sleeping-place. Many of the older ones, however, have several chambers, each with its beehive roof. Captain Thomas considers them a survival of the Scotic type of the

earliest artificial dwelling. Beehive constructions of various types and periods are described and figured in Dr. Arthur Mitchell's *Past and Present;* Dr. Joseph Anderson's *Scotland in Early Christian and Pagan Times;* and Lord Dunraven's *Sketches of Irish Architecture.* Huts of beehive shape, but of light materials, are used by various savage peoples. See illustration under ARCHITECTURE, Vol. II, p. 384.

BEECHER, CATHARINE ESTHER, eldest child of Lyman; born at East Hampton, Long Island, Sept. 6, 1800; died at Elmira, New York, May 12, 1878. She was educated at Litchfield Seminary. Her betrothed lover, Professor Fisher of Yale, was drowned while on a voyage to Europe, and her sorrow was so great that, according to her brother, Henry Ward, her religious faith was almost wrecked, and she only found relief by plunging into a life of great activity. The cause of female education was very dear to her heart, and in 1822 she started a school for young ladies at Hartford, Connecticut. For 10 years the school was carried on and Harriet Beecher assisted in the teaching. The institution prospered, and 160 pupils were in attendance. She was the author of some schoolbooks, several works on the woman question, and a number of books on religion. She believed and taught that physical and moral training should receive the same attention as intellectual development. For two years she conducted a school in Cincinnati, Ohio. She assisted ex-Governor Slade of Vermont in a plan for supplying women teachers in the great West. Miss Beecher was an intensely practical woman; earnest, patient, energetic, and of great good humor. She did not approve of classical and modern music, neither was she an admirer of art. For many years she worked under the disadvantage of great physical weakness. In her youth she was a Presbyterian, but in after years she became a member of the Episcopal Church. Among her best-known works are *Domestic Economy; Physiology and Calisthenics; Elementary Theology;* and *Common Sense Applied to Religion.*

BEECHER, CHARLES, son of Lyman; born at Litchfield, Connecticut, Oct. 7 1815. He was educated at the Boston Latin School, the Lawrence Academy at Groton, Massachusetts, Bowdoin College and Lane Seminary. He became a minister, and was installed pastor of the Second Presbyterian Church at Fort Wayne, Indiana, in 1844. The First Congregational Church of Newark, New Jersey, was his next charge; and from here he went to the First Congregational Church in Georgetown, Massachusetts. He spent seven years in Florida, and on his return was made pastor of a church at Wysox, Pennsylvania. Mr. Beecher is a fine musician, and assisted in compiling the *Plymouth Collection of Hymns and Tunes.* He has published *David and His Throne; Pen-Pictures of the Bible; Autobiography and Correspondence of Lyman Beecher;* and a few other works.

BEECHER, EDWARD, son of Lyman; born at East Hampton, Long Island, Aug. 27, 1803; died July 28, 1895. He graduated at Yale in 1822, and studied theology at Andover Theological Seminary and at New Haven. He was called to the Park Street Church of Boston, where he remained for four years, and then was tendered the presidency of Illinois College at Jacksonville. Subsequently he was pastor of the Salem Street Church in Boston, and the Congregational Church at Galesburg, Illinois. Chicago Theological Seminary called him to the chair of exegesis. In 1872 he left the ministry and removed to Brooklyn, New York. He has been a constant writer for journals, and was editor of the *Congregationalist* for six years. He wrote two books, *Conflict of Ages* and *Concord of Ages*, which created considerable discussion, from the fact that he advanced the theory that "man's present life is an outgrowth of a former life, as well as a prelude to a future one." He published sermons, addresses and several religious books.

BEECHER, EUNICE WHITE BULLARD, wife of Henry Ward Beecher; born at West Sutton, Worcester County, Massachusetts, Aug. 26, 1812. She received her education at Hadley, Massachusetts, and after a seven years' engagement she married Mr. Beecher aud went to live in Lawrenceburg, Indiana. In her early married life she wrote the story, *From Dawn to Daylight.* She has since published *Motherly Talks with Young Housekeepers; Letters from Florida; All Around the House;* and *Home;* and since her husband's death has written a series of articles for the *Ladies' Home Journal*, entitled *Mr. Beecher as I Knew Him.* Died March 8, 1897.

BEECHER, GEORGE, son of Lyman; born at East Hampton, Long Island, May 6, 1809; died at Chillicothe, Ohio, July 1, 1843. He was a graduate of Yale, studied theology, and served successively as pastor of Presbyterian churches at Rochester, New York, and Chillicothe, Ohio. His death was caused by the accidental discharge of a gun.

BEECHER, HARRIET. See STOWE, HARRIET BEECHER, in these Supplements.

BEECHER, HENRY WARD, an American clergyman and orator; born at Litchfield, Connecticut, June 24, 1813; died at Brooklyn, New York, March 8, 1887; was the most famous son of Dr. Lyman Beecher, and for the greater part of 40 years, between 1847 and 1887, stood before the American public as the powerful, eloquent and magnetic preacher of Plymouth Church, Brooklyn, New York.



HENRY WARD BEECHER.

Educated at the Boston Latin School, Amherst College, and Lane Seminary, he took his first pastorate at Lawrenceburg, Indiana, in 1837. In two years he was called to Indianapolis; and thence he went, in 1847, to commence his ministry at Brooklyn, having already the reputation of being a great pulpit orator. His popular quali-

ties of genial humor, sonorous voice and facility of illustration were equaled by the boldness with which he attacked the vices and evils of social and political life, and he soon became a power in the church and in the community at large. His services as a lecturer were in great demand, and in January, 1859, at the centennial aniversary of the birth of Robert Burns, he delivered, by invitation, a masterful oration on the life and character of that poet, which put him completely in touch with the working-people of the civilized world. In 1863, during the Civil War, he went abroad to make known to the people of England the merits of the Federal cause, at a time when they were blindly following political leaders who desired the dismemberment of the American Union, and sought pretexts for hostile intervention. By means of his oratorical skill and personal courage and magnetism he succeeded in his ardous mission, thereby rendering to his country, under peculiarly adverse circumstances, an important service, which was gracefully acknowledged when, in 1865, after the war, he was selected to deliver the oration at Fort Sumter on the anniversary of its surrender.

In 1874 arose the Tilton-Beecher scandal, which a church trial decided in Mr. Beecher's favor; but which, when subsequently brought into the civil courts by Mr. Tilton, resulted in a disagreement of the jury, nine of the twelve deciding in Mr. Beecher's favor. In 1878 Mr. Beecher was elected chaplain of the Thirteenth Regiment, New York National Guard; when Henry W. Sage founded the Lyman Beecher lectureship of preaching at Yale, Mr. Beecher, in 1872–74, delivered the first three courses. In 1882 Mr. Beecher avowed his disbelief in eternal punishment. He was an active supporter of the Republican party until 1884, when he voted for the Democratic Presidential nominee. He married, in early life, Emma White, the daughter of Dr. Artemas Bullard, who loyally adhered to him through all adversities.

Mr. Beecher, in 1836, edited the *Cincinnati Journal*, a religious weekly, and while at Indianapolis, the *Farmer and Gardener*, an agricultural journal; he was for twenty years a contributor to the New York *Independent*, and from 1861 to 1863 its editor; in 1870 he became the first editor of the *Christian Union*. Some of the best known of his many published books are *Star Papers; Lectures to Young Men; Aids to Prayer; Norwood*, a novel; *Yale Lectures on Preaching;* and a *Life of Christ*. He printed the *Plymouth Collection of Hymns and Tunes*, and from his pulpit discourses were compiled *Life Thoughts; Notes from Plymouth Pulpit; Comforting Thoughts;* and others. He was an ardent advocate of the anti-slavery and of the temperance reforms. His biography was written by William C. Beecher and Samuel Scoville, assisted by Mrs. Henry Ward Beecher (1888).

BEECHER, JAMES CHAPLAIN, son of Lyman; born at Boston, Massachusetts, Jan. 8, 1828; died at Elmira, New York, Aug. 25, 1886. He graduated at Dartmouth in 1848, and afterward pursued his theological studies at Andover, being ordained a Congregational minister in 1856. He was chaplain of the Seaman's Bethel in Canton and Hongkong, China, until 1861, and in 1861–62 chaplain of the First New York infantry. He was lieutenant-colonel of the One-hundred-and-forty-first (1862–63), colonel of the Thirty-fifth United States colored troops (three years), and in 1866 was mustered out of service as brevet brigadier-general. After the war he held pastorates at Owego, Poughkeepsie and Brooklyn, New York. He became insane, and after three years of suffering committed suicide at Elmira.

BEECHER, LYMAN, an American clergyman; born in New Haven, Connecticut, Oct. 2, 1775; died in Brooklyn, New York, Jan. 10, 1863; was the descendant of New England ancestors, who settled in New Haven in 1638. His father was a blacksmith, and in consequence of his mother's death, he was adopted by his uncle, Lot Benton. The Rev. Thomas Bray fitted him for college, and he graduated from Yale in 1797. Having pursued the study of theology during his college term, he was licensed to preach a year later, and began his clerical labor in the Presbyterian Church at East Hampton, Long Island, where he remained for eleven years. He had married Roxana Foote, and as his salary was only four hundred dollars a year, his wife taught a private school to assist in the support of the family. He was obliged to resign his charge, and moved to Litchfield, Connecticut, where he could get a better salary. Here he remained for sixteen years, winning fame by his eloquent sermons and his fearless denunciations of intemperance. The Hanover Church of Boston called him to its pastorate. This was a time of religious controversy, for Dr. Channing had broken with Congregationalism, and many people were following his lead. In this controversy Dr. Lyman Beecher took an active part, warmly upholding Puritan doctrine. After remaining here six years he was called to the presidency of the new Lane Theological Seminary, near Cincinnati, and the pastorate of the Second Presbyterian Church of that city. The question of slavery began to be discussed in the seminary, and as many of the students were from the South, the debate became violent. The trustees forbade further discussion, and all the students left the seminary. Some were induced to return, but this secession destroyed the prosperity of the seminary, and Dr. Beecher was unable to build it up again. In 1835 he was tried on the charges of heresy and hypocrisy by some of the more rigid Calvinists, but was acquitted. Leaving Lane Seminary in 1842, he returned to Boston and gave his time to the revision of his books. His *Views in Theology;*



LYMAN BEECHER.

*Sermons on Temperance;* and *Remedy for Duelling*, were extensively read, and exerted a powerful influence. The last years of his life were spent in Brooklyn, at the home of Henry Ward Beecher.

BEECHER, THOMAS KINNICUT, American divine, son of Lyman Beecher, was born at Litchfield, Connecticut, Feb. 10, 1824, and was graduated in 1843 from Illinois College, whose president at that time was his brother Edward. After teaching for several years he organized, in 1852, a Congregational church in the eastern division of Brooklyn. Two years later he became pastor of the Park Church at Elmira, New York. During the Civil War he was for a time chaplain of a regiment of volunteers. He has traveled extensively in Europe and America, and has published books on religious subjects, among them *Our Seven Churches*. He is noted as a philanthropist, and is greatly beloved by all who know him.

BEECH-HOPPER (*Orchestes fagi*), a coleopterous insect of the weevil family. They lay their eggs between the surfaces of the leaves, and thus inflict much damage, especially to beech trees.

BEEDER, a walled town of central India, formerly the capital of a district of the same name, but now included in the Nizam's territories. It is about 75 miles to the N.W. of Hyderabad, being in lat. 17° 53′ N., and long. 77° 36′ E. It was formerly a place of grandeur and importance, but it is at present chiefly remarkable for its manufactures, the most important being that of tutenag, an alloy resembling German silver, and used in making tableware. It is composed of copper, zinc and nickel, with slight admixtures of lead or iron.

BEE-EATER, a name given to several Old World birds related to the kingfishers, and belonging to the family *Meropidæ*. The name refers to their habit of eating bees, wasps and similar insects, which are captured on the wing. In countries where bees are kept the bird is a great pest.

BEEF-EATERS, South African birds of the genus *Buphagus*, and of the starling family. They associate with oxen, buffaloes, camels, etc., and feed upon the larvæ of flies abounding in the skins of these animals. The buffalo-bird is a member of this genus. They are often called oxpeckers.

BEEFEATERS, a term applied to certain English functionaries, the yeomen of the Royal Guard, who have formed part of the train of the sovereign since the time of Henry VII. They originally formed a corps of 50 soldiers, whose duty it was to wait upon the king, especially at meals. The wardens of the Tower of London are well known as the "Beefeaters." Their costume or livery has been the same for four centuries, with the exception of some slight changes made in 1858.

BEEFWOODS, a name applied to various woods: that of the Australian genus *Casuarina*, the only genus of its family, whose wood is reddish, hard, and close-grained, with dark and whitish streaks, and used for fine ornamental work; that of *Pisonia obtusata* of the West Indies; that of *Ardisia coriacea*, of Jamaica. The wood of *Schoepfia chrysophylloides* is often called "white beefwood."

BEERS, HENRY AUGUSTIN, literary writer, was born in Buffalo, New York, July 2, 1847. He was graduated from Yale in 1869, and six years later became a professor of English there. Mr. Beers has been a frequent contributor to periodical literature, and has done considerable special writing for dictionaries and encyclopædias. His verse writings include *Odds and Ends* and *The Thankless Muse*. Among his prose writings are *Life of N. P. Willis; Initial Studies in American Letters;* and *From Chaucer to Tennyson*. He edited, in 1878, *A Century of American Literature*.

BEESLY, EDWARD SPENCER, writer upon historical and political subjects, was born at Feckenham, Worcestershire, England, in 1831. A few years after his graduation from Wadham College, Oxford, he was appointed professor of history in University College, London. Mr. Beesly has twice been an unsuccessful Liberal candidate for Parliament. In addition to a number of political and social treatises, he has published *Catiline, Clodius and Tiberius*, a series of lectures upon Roman history.

BEESTINGS (technically *colostrum*) is the term applied to the first milk yielded after delivery. It differs considerably from ordinary milk, and generally is a turbid, yellowish viscous fluid, similar in appearance to soap and water. It is found to contain, in addition to the ordinary milk-corpuscles (see MILK, Vol. XVI, p. 303), peculiar conglomerations of very minute fat-granules, which are known as colostrum-corpuscles. The chief chemical differences between beestings and milk are, that the former is very deficient in casein and proportionately rich in albumen, and that it contains nearly three times more salts than the latter. It is probably this excess of salts that usually causes it to exert a purgative effect upon the newborn offspring, and thus remove the meconium which has accumulated in the fœtal intestine.

BEET, the well-known *Beta vulgaris*, a plant of the family *Chenopodiaceæ*, or goosefoot, being, with spinach, the only useful plants of an otherwise notorious group of weeds. The beet is a native of southern Europe and western Asia, and has been long cultivated, chiefly as a root-vegetable, and also as a cattle-food (mangel-wurzel, or scarcity-root), as a pot-herb, as a foliage-plant, and more lately as a sugar plant. The sugar-beet industry is becoming an important one in the northern Mississippi valley states.

BEET, JOSEPH AGAR, Wesleyan theologian, was born in Sheffield, England, Sept. 27, 1840. He graduated from Wesleyan Theological College, and became professor of systematic theology there in 1885. He is the author of commentaries upon a number of the Pauline epistles, and published, in 1892, *Through Christ to God: A Study in Scientific Theology*.

BEET-FLY, a dipterous insect of the family

*Muscidæ*. Its larvæ do great damage to the leaves of the beet, and plants allied to the beet.

BEETLE-STONES, the name given by the lapidaries of Edinburgh to nodules of coprolitic ironstone, found abundantly in a shale cliff at Newhaven, near Leith. Their name is taken from the resemblance of the inclosed coprolite to the shape of a beetle. They take a beautiful polish, and ornamental articles are made from them. See COPROLITES, Vol. VI, p. 353.

BEETLING, the process of "finishing" linen or cotton cloth with a beetle or beetling-machine, instead of by mangling. The texture is hammered by heavy wooden mallets or stamps, and the cloth is given a hard and stiff appearance. (See BLEACHING, Vol. III, pp. 818, 819.) The process is mostly applied to cotton shirting. The name is also given to the process in flax-dressing by which the flexible fibers are separated from the woody ones.

BEETS, NIKOLAAS, a Dutch poet, was born in Haarlem, Sept. 13, 1814. After studying at Leyden, he became, in 1840, pastor at Heemsteê. After 14 years he removed to Utrecht, and in 1875 became professor of theology in the university at that place. He attained fame by his *Camera Obscura*, prose sketches of Dutch life, and a masterpiece of humor and character. It was published in 1836. Earlier he had translated into Dutch extracts from the poems of Scott and Byron, and had written poems in imitation of their style. Among his later volumes of poetry are *Gedichten; Korenbloemen; Nieuwe Gedichten; Verstrooide Gedichten;* and *Madelieven*. He is the author of a valuable work of historical criticism, entitled *Paul in the Most Important Moments of His Life and Work*. As a critic, his authority is universally recognized, and though his career has been uneventful, his influence upon Dutch literature has been considerable.

BEET SUGAR. The raising of sugar-beets forms one of the most thriving agricultural industries in several states of the Union, and the manufacture of beet sugar has increased to a great extent within recent years throughout Europe and the United States. Careful experiments indicate that the beet can be successfully grown for sugar in the United States through a zone about 200 miles wide, reaching from the Atlantic to the Pacific, including portions of New England, northern New York, Pennsylvania, Ohio, Indiana, Illinois, Wisconsin, southern Iowa, portions of Nebraska, the Dakotas, Washington and California. The first impetus given to the culture of the beet-root was in the spring of 1890, when the Agricultural Department at Washington, through the division of chemistry, sent out 5,000 packages of the best seed obtainable from European growers. These seeds were distributed throughout 28 states and territories, and specific directions as to methods of cultivation accompanied each package. At the maturity of the crop, about 1,000 localities sent in samples for government analysis, the results of which showed that conditions were favorable in this country for the production of the highest type of the sugar-beet. California stood first in the production of beets,—richest in sugar and greatest in tonnage; Washington stood second, Nebraska third, Kansas fourth, while Utah and Colorado were declared to be equally entitled to the fifth rank. Position was given to all of the states furnished with seed, and it was found that the greater number fell below a condition where they could grow the beet and manufacture the sugar in competition with the few mentioned as ranking high. In the states where the conditions are most favorable for culture, the industry has proven profitable alike to the raiser of the beets and the manufacturer of the sugar, and both industries have advanced to a great extent; in California the production of 1893 being double that of the preceding season, which was also true of the product in the United States for the same period. From 1890 until 1894 the general government paid a bounty of two cents per pound to the manufacturers of beet sugar, and in some of the states a local bounty was also paid. This action on the part of the government necessitated the licensing of the factory, and a strict supervision was maintained over the business. These conditions made it possible to secure accurate tests of results, and many of importance were made. It was found that to produce one ton (2,000 pounds) of granulated sugar the following amounts were required, only the states ranking relatively high being included in the list: California, 7.69 tons; Nebraska, 11.36 tons; Utah, 13.07 tons; Virginia, 13.88 tons. For 1894 the world's supply of sugars of all kinds was 6,034,711 tons, of which 3,700,525 tons were made from the beet. Of the entire amount of sugar produced, the United States consumed about 2,000,000 tons,—an average *per capita* of 61 pounds. At the prevailing price of sugar during the time named, this world's supply would amount to the sum of $482,776,880, the amount consumed in the United States to $160,000,000, of which the amount produced here only reached the sum of $20,000,000, leaving to be imported the amount of $140,000,000. In this connection it is interesting to know that in California alone is there sufficient territory in every way adapted to the culture of the sugar-beet to supply all the sugar now imported into the United States. The process of making beet sugar is not the same in all localities, but the method now most generally pursued is as follows: The beets are first washed in a rotary drum immersed in water, then rasped into pulp and squeezed in woolen sacks by hydraulic pressure, or in continuous revolving presses, or the sugar may be removed by diffusion in iron tumblers. The juice is clarified with lime filtered through animal charcoal, crystalized in vacuum, and drained by a centrifugal machine. See AGRICULTURE, Vol. I, p. 381; SUGAR, Vol. XXII, pp. 625, 626.

BEEVILLE, capital of Bee County, southern Texas, is 96 miles S. of San Antonio and 170 by rail S.W. of Houston. It is on the Gulf, West Texas and Pacific and San Antonio and Aransas Pass railways. It is in a fertile, almost tropical, region,

which is in the same latitude as Tampa, Florida, and where oranges and bananas may be grown; is 56 miles from the coast. Population 1890, 1,311.

BEFFANA is a corruption of *epiphania* (epiphany), and is the name of an old female character in Italian folk-lore who was so busily engaged in house-cleaning when the three wise men of the East passed by on their way to offer their treasures to the infant Saviour that she excused herself for not going out to see them, thinking that she would have an opportunity of doing so when they returned. Not knowing that they went home by another road, she has been ever since watching for them. She, like the Dutch Santa Claus, is supposed to take a great interest in children, who, in Italy, are put to bed early on Twelfth-night, a stocking of each being hung before the fire. Soon the cry *Ecco la Beffana* is raised, when the children jump up and seize their stockings, each of which contains a present bearing some proportion in value to the conduct of the child during the year. One whose behavior has been particularly bad finds his stocking filled with ashes, in token of the Beffana's displeasure, and Italian mothers use the word to frighten naughty children into good behavior. The custom of carrying an effigy called the Beffana, on Twelfth-night, in procession through the streets is probably a relic of one of the "mysteries" of the middle ages.

BEFFROI, a movable tower used in the sieges of the walled towns of ancient or mediæval times. These towers covered the approach of troops. The highest had from 12 to 15 stories or stages placed upon 6 or 8 wheels. They were often covered with rawhides to protect them from the boiling grease and oil directed against them by the besieged. At the top there was a hinged drawbridge, intended to aid the attacking soldiery in passing over the wall of the besieged town. Cæsar used beffrois in his campaigns in Gaul.

BEG, a Turkish title. See BEY, in these Supplements.

BEGKOS OR BEIKOS, a large village of Anatolia, Asia Minor, is on the Bosporus, 8 miles from Scutari, and opposite Constantinople. Here was fought the mythological battle between Pollux and Amycus, in which the latter was killed. At the commencement of the Crimean War the allied fleets anchored in Begkos Bay, prior to their entering the Black Sea in 1854.

BEGONIACEÆ, a family of dicotyledonous plants named in honor of Michael Bégon, a French patron of science. They are herbaceous, with alternate leaves, which are oblique at the base and have large dry stipules; the flowers are in cymes, unisexual, the perianth colored with four unequal divisions in the male flowers, and five or eight in the female; the stamens are numerous; the fruit is membranous, winged, three-celled, bursting by slits at the base, the seeds minute.—BEGONIA, the typical genus, gives name to the family, and is found in nearly all warm regions. The various species are extensively cultivated on account of their showy, often highly colored, foilage, as well as for their showy and singular flowers. The stalks of certain species are used in cookery. Some species, also, are used as purgative medicines. The species of *Begonia* have been extensively manipulated by florists, the greatest diversity in the remarkable foliage leaves having been produced by skillful crossing. They are readily propagated by stem-cuttings, and many of them by leaf-cuttings. See HORTICULTURE, Vol. XII, p. 265.

BEGONIELLA, a genus of dicotyledonous plants of the family *Begoniaceæ*, indigenous to the United States of Colombia, and containing but two species. Interesting chiefly as a near relative of the extensively cultivated genus *Begonia*.

BEG–SHEHR OR BEI–SHER, a lake of south-central Asia Minor, lying at the foot of the Sultan Dagh Mountains. It is more than 20 miles long and from 5 to 10 in width. It contains numerous small islands, and its waters are tributary, via a river having the same name, to Lake Soglah. On its shores stand the towns of Begshehr and Kereli. The former is the old Caralio, where imperial coins were issued, and near where stood the ancient capital of the district of Pamphylia. The large town Koniyeh is 44 miles to the N.E. See also ISAURIA, Vol. XIII, p. 384.

BEGTASHI, a secret religious order of Turkey, which had its origin in the fourteenth century. The name is believed to be derived from that of a celebrated dervish, Hadji Begtash, to whom also the order appears to owe its foundation. The members use secret signs and passwords resembling those of Freemasonry. Although numbering many thousands of influential persons in its ranks, the society does not appear to exercise any material influence on the religion or politics of Turkey.

BEHAM, BARTHEL OR BARTHOLOMEW, painter of portraits, and engraver, was born in 1502, in Nuremberg, Germany; died in Italy in 1540. He was a pupil of Albrecht Dürer's, whose influence upon his earlier work is evident. His beautiful copper-plate engravings of Emperor Charles V, and his brother, Emperor Ferdinand I, are the finest extant examples of the engraving of that time.

BEHM, ERNST, a German geographer and authority on statistics of population, was born at Gotha, Jan. 4, 1830; died there, March 15, 1884. In 1856 he became Dr. Petermann's chief assistant in editing the famous geographical periodical, *Mitteilungen*, to the editorship of which he succeeded, on his chief's death in 1878. In 1872 he undertook, in conjunction with H. Wagner, the *Bevölkerung der Erde*, intended as a statistical supplement to the *Mitteilungen*. From 1876 until his death he had charge of the statistical department of the *Almanach de Gotha*.

BEHRING SEA. See POLAR REGIONS, Vol. XIX, p. 318; also BERING SEA QUESTION, in these Supplements.

BEHRENDS, ADOLPHUS JULIUS FREDERICK, Congregationalist minister, was born at Nymwegen, Holland, Dec. 18, 1839; came with his parents to this country when still quite young.

He was educated at Denison, Ohio, and graduated from the Rochester (Baptist) Seminary in 1865. He occupied Baptist pulpits (the last one at Cleveland, Ohio) until 1876, when he became pastor of the Union Congregational Church, Providence, Rhode Island. In 1883 he was chosen pastor of the Central Congregational Church of Brooklyn, succeeding the Rev. H. M. Scudder. Two volumes from his pen have been published, *Socialism and Christianity*, and *Philosophy of Preaching*. He has lectured extensively, and contributed many articles to current religious journals.

BEILAN, a pass and town in the northern extremity of Syria, on the east shore of the Gulf of Iscanderoon. It is the lower of the two passes between Cicilia and Syria. These are thought to be the Amanian Gates mentioned by Cicero. In the war between Darius and Alexander, the Beilan Pass was an important consideration to both commanders. The town has a population of 5,000, and considerable wealth. It is supplied with fine water by numerous aqueducts. In 1832 it was a scene of battle between the Egyptians and Turks, in which the latter were defeated. See also CILICIA, Vol. V, p. 777.

BEILSTEIN, FRIEDRICH CONRAD, Russian chemist, was born in St. Petersburg in 1838. He has done important work on the carbon compounds, and his *Handbook of Organic Chemistry* (1891) is recognized as a valuable addition to chemical literature. In 1866 he became professor of chemistry in the Technological Institute in St. Petersburg.

BEITH, a town in the county of Ayr, southwestern Scotland, is 9 miles S.W. of Paisley, 15 miles from Glasgow, and 20 miles by rail N. of Ayr. Here cotton and muslin are manufactured, and in the vicinity the famous Dunlop cheese is made. Population, 4,795.

BEJAN, the name given to the first or "freshman" class in the universities of Aberdeen and St. Andrews, Scotland, and formerly in many of the continental universities. The word is thought to be derived from the French *bec-jaune*, or yellow-neb, a term used to designate a nestling, or unfledged bird. In the University of Vienna the *bejan* was called *beanus*, a word of the same meaning and origin.

BEK, ANTHONY, an English ecclesiastic who became Bishop of Durham in 1283. He took a prominent part in the Scottish wars of Edward I, and held a command at the battle of Falkirk. In 1300 he became involved in ecclesiastical disputes that continued until his death, which took place upon the 3d of March, 1311. He was a prelate of great magnificence and unbounded ambition.

BEKÁ', a mountain valley between the mountains Libanus and Antilibanus, in Syria. It was called Cœle-Syria by the ancients, and is spoken of in the Old Testament as the Plain of Lebanon. Although it is the most fertile and best-watered plain of Syria, but a very small portion of it is under cultivation. Hamath, at the mouth of the Bekâ' valley, has been from a very early period one of the most important places in Syria. According to the Bible account, the original inhabitants were Canaanites.

BÉKÉS-CSABA, a city of central Hungary, is at the junction of the White and the Black Körös rivers, and 110 miles by rail S.E. of Budapest. It has an extensive trade in cattle and corn. Population, 32,500.

BELAIR, capital of Harford County, northwestern Maryland, is 23 miles by rail N.W. of Baltimore. It is in the center of a fertile agricultural district, and has large canning-factories and flour-mills. Population 1890, 1,416.

BELCHER, SIR EDWARD, rear-admiral in the English navy, was born at Halifax, Nova Scotia, in 1799, and died March 18, 1877. He was appointed, in 1825, assistant surveyor to the expedition about to explore Bering Strait under Captain Beechey. He was made commander in 1829, and seven years later he was placed in charge of the *Sulphur*, bound for the western coasts of America and the Indies, on a tour of exploration. He returned within six years, during which time he had circumnavigated the globe and rendered valuable aid, in the Canton River, to Lord Gough, whose successes over the Chinese were greatly due to Belcher's soundings and reconnaissances into the interior. From 1852 to 1854 he was in command of the unsuccessful expedition sent to relieve Sir John Franklin, the Arctic explorer. He published *A Treatise on Surveying* and a *Narrative of a Voyage Round the World*. He attained the rank of rear-admiral in November, 1872.

BELDING, town of Ionia County, central Michigan. It is 140 miles N.W. of Detroit, and 20 N.E. of Grand Rapids. There are located here two silk factories and a number of woodworking concerns, including a large refrigerator factory. Belding is the terminus of a spur of the Detroit, Lansing and Northern railway. Population 1890, 1,730.

BELED-EL-JEREED, an extensive desert region of northern Africa, lies east of Morocco, and stretches from Algeria on the north to the Sahara Desert on the south. It receives its name, meaning the "country of dates," from its one scanty production.

BELEM OR PARÁ, a city, capital of Pará, a Brazilian state which occupies the lower portion of the Amazon valley. Belem is at the confluence of the Guamá and Pará rivers, and 85 miles from where the latter empties into the Atlantic. The city is well built, has broad and shaded streets, and residences with beautiful grounds. The cathedral, the custom-house, and the government theater are the most pretentious buildings. This city is the commercial center of the Amazon valley; the eight million pounds of rubber exported each year makes it, in this commodity, far the most important port in the world. Poor harbor facilities oblige very large vessels to anchor a few miles below the wharves. Belem has a theological (Catholic) seminary, and good schools. Population 1892, 65,000. See also PARÁ, Vol. XVIII, p. 233.

BELEMNITES, a fossil family of mollusks of the class of cuttle-fishes (*Cephalapoda*). They are abundant in some parts of the Jurassic and Cretaceous rocks. See CUTTLE-FISH, Vol. VI, p. 738.

BELEN, capital of Quitman County, northwestern Mississippi, is 13 miles N.E. of Clarksdale, the nearest railway point, and 4 miles W. of the Yazoo River. Population 1890, 184.

BELFAST, city and capital of Waldo County, south-central Maine, and the terminus of a branch of the Maine Central railway. It is a port of entry, and is beautifully situated on a hillside overlooking Belfast Bay, about 30 miles S. of Bangor. The harbor is deep, wide and safe. The principal industries are ship-building, granite-quarrying, fishing, and the manufacture of paper, shoes and iron. Population, 5,294.

BELFORD, CHARLES, journalist, was born in Cork, Ireland, April 15, 1837; died in Canada, Dec. 19, 1881. He received a university education, and his family having emigrated to Canada in 1856, he became one of the editorial staff of the Toronto *Leader*, then a prominent Conservative daily. On the retirement of Mr. Lindsey, Mr. Belford was at once promoted to the chief editorial chair, and occupied it until late in the year 1871, when he was induced to take charge of the *Mail*, a new Conservative daily, the first number of which was issued on March 30, 1872. In 1879 he accepted the position of secretary to the Dominion board of appraisers at Ottawa. Although Mr. Belford was never a violent party man, he was a fearless opponent. He was a stanch supporter of the crown and constitution. In religion he was a member of the Church of the Disciples. So high an opinion had President Garfield of his ability and integrity, that he sought to induce him to leave Canada and take charge of a prominent New York daily paper. He was one of the editorial commissioners on confederation; was president of the Canadian Literary Association, and the originator of the national protection policy cry, which carried the Conservative party to victory. Notwithstanding his constant arduous labors, the Canadian *Eclectic Monthly* and the Canadian *Belford's Magazine* had the benefit of his clear head and fostering care. His unceasing labors overtaxed his delicate constitution, and for the last eight years of his life he was a confirmed invalid.

BELFRY (Fr. *beffroi*), a word of doubtful origin; a bell tower or turret, usually forming part of a church, but sometimes detached from it, as at Evesham and Berkeley, in England, and still more frequently in Italy. A belfry belonging to a church situated in a deep glen was built upon a neighboring height, as at Ardclach, Scotland, and at St. Feve and other places in Cornwall. At Dunkirk, in northern France, is a *beffroi* 300 feet high, surmounted with signals for vessels in distress and containing a very celebrated peal of bells. The most beautiful belfry in the world is at Bruges. (See BRUGES, Vol. IV, p. 396.) At the close of the seventeenth century, it was a common thing in Scotland for the bell to be hung upon a tree, as at Aldbar, for instance. A belfry consisting of a mere turret is called a *bell-gable*, or *bel-cote*, and always stands on the west end of the church. A smaller one is sometimes placed at the east end, over the altar for the Sanctus bell. After the twelfth century, when the burghs began to gain influence, they asserted their right to have bells to call the burghers together for council or for action. Thus in the hearts of towns there arose municipal belfries. In California the old missions, built by the Franciscan fathers, had each its belfry, sometimes a part of the main structure and sometimes detached. Most of them are now in ruins. Of them the best preserved is at Santa Barbara.



BRUGES BELFRY.

BELGÆ, name given by Cæsar to one of the three peoples of ancient Gaul. See GAUL, Vol. X, p. 111.

BELGIOJOSO, CRISTINA, PRINCESS OF, was born in Milan, Italy, June 28, 1808, and died there, July 5, 1871. Her father was Marquis Geronimo Isidoro Trivulzio, and on Sept. 14, 1824, she became the wife of Prince Emilio Barbian e Belgiojosa. She removed to Paris in 1830, having been banished by the Austrian government for her vigorous espousal of the cause of Italian freedom. In Paris her drawing-rooms became famous as the favorite gathering-place of men and women prominent in literature and politics. Her return to her home in 1848 was followed by a new exile, decreed on account of her efforts to incite revolution in Milan and Rome. After extensive travels in Greece and the East she settled again in Rome in 1855. She was permitted to return to her home in 1861, where she remained until her death. Among her published writings are *Souvenirs of Exile; Essay upon the Formation of the Dogmatic Cult; Emina, Turco-Asiatic Tales; Observations upon the Actual Condition of Italy;* and frequent contributions to French and Italian journals. She was a tireless worker in the cause of her fatherland and exerted a remarkable influence.

BELGIUM, one of the lesser states of western Europe. See Vol. III, pp. 514–531, for geography and history up to 1880.

In April, 1885, King Leopold II of Belgium, who had given vigorous and efficient support to the explorer Stanley's work in central Africa, and had made vigorous efforts toward the suppression of the African slave-trade, became, by recognition of the Congo International Congress held at Berlin, individual sovereign of the Congo Free State (q.v., in these Supplements), whose virtual founder he had been. By will of August 2d of the same year, he bequeathed his sovereign right to that state to the constitutional monarchy of Belgium. In accepting the protectorate over the Congo Free State, Belgium reserved the right of annexation after 1900.

Prince Baldwin of Flanders, heir presumptive to the Belgian throne, died on the 22d of January, 1890. He was the son of the Count of Flanders, the brother of King Leopold. The hopes of the country now center in Albert, a younger son of the Count.

During the same month, there met in Brussels a great convention, which declared in favor of a

revision of the constitution to provide for universal suffrage. Two months later the question came up for discussion in the committee of the Chamber of Deputies. Considerable debate upon the matter resulted in the appointment of a committee upon revision, which made its report about a year later. On the 7th of September, 1893, there was promulgated a law which made the Senate to consist of members chosen by the people, partly directly, partly indirectly. The number of those elected directly was to be proportional to the population of each province. Senators indirectly chosen were to be selected by the provincial councils. Members of the Chamber of Representatives, by this law, are elected directly, and cannot exceed one for every 40,000 inhabitants. On Jan. 28, 1893, the parliamentary revision committee declared themselves for household rather than manhood suffrage. This announcement led to a succession of industrial strikes and riots, which, after the concession of manhood suffrage by the Chamber, April 18, 1893, immediately subsided.

On the 5th of May, 1894, an international exposition of arts, science and industries was opened at Antwerp. The grounds were more than 200 acres in extent, and the numerous and elegant buildings were chiefly built of metal and glass. The exposition continued until the 12th of November.

The first election of members of the Chamber of Deputies, under the new law of suffrage to all male citizens over 25 years of age, took place upon the 14th of October, 1894. The returns gave an overwhelming majority to the clerical candidates, as opposed to those of the Liberalist and Socialist parties. Aug. 3, 1895, the new parliament passed a bill which provided for compulsory religious instruction in all the schools of Belgium. This was passed over the law of 1879, which had eliminated religious teaching from the list of compulsory subjects. Violent objections to this measure had been made by the Liberals and Radicals, and July 28, 1895, witnessed a protest made against this bill by a convention of more than 100,000 delegates who had assembled at Brussels for that purpose. On August 30, the bill passed the Senate, and it became a law on the 17th of September, by publication of the royal sanction.

Belgium, with an area of 11,373 square miles (less than the state of Maryland), has a population of 6,250,000, or 549 per square mile (Maryland has 85 per square mile). Emigration amounts to about 20,000 individuals each year; immigration, slightly greater. The unemployed proportion of the population is less than in most European countries. The Roman Catholic religion is professed by nearly all the people. The French and Flemish tongues are spoken with equal frequency.

No country surpasses Belgium in its solicitude for public instruction. There are four great universities in the kingdom, and to these are attached various special and professional schools. Other professional schools are the Royal Academy of Fine Arts at Antwerp, with 1,500 students; schools of design, 14-000 students; royal conservatories and other schools of music, 15,000 students.

The various classes of public schools, from royal colleges to infant schools, number, in all, 8,776, with an enrollment of 850,000 pupils. Besides the public schools there are many private or free schools—about 80 colleges, 65 middle-class schools for boys, 150 institutions for girls, besides many infant, primary and adult schools, mostly under ecclesiastical care.

Every commune is bound to maintain at least one school for elementary education, the government paying one-sixth, the province one-sixth and the commune four-sixths of the expenditure. The total sum spent on elementary education in one year is in the neighborhood of $6,000,000.

The larger part of the soil of Belgium is divided into holdings of 25 acres or less in extent, and there are very few large estates. Seventy per cent of the soil is under cultivation, and wheat, oats, rye and tobacco are the chief products. The total annual value of the agricultural products is little less than $280,000,000; of animal produce, about $50,000,000. Seventeen per cent of the soil is covered by forests.

The mining and metal industries are of great importance, and employ fully 300,000 persons. Of coal, about 22,000,000 tons are produced annually; of iron, 2,000,000 tons are exported annually. The zinc-production each year is worth $7,000,000. There are 125 sugar-manufacturing establishments, and about 35 refineries, whose total output amounts to 2,500,000 pounds each year. Of distilleries there are 230. The annual catch of deep-sea fish is worth $700,000.

*Industry and Labor* is the name of a special department of the government, which is in direct control of all industries. The imports and exports each amount to about $270,000,000 annually. There are 5,700 miles of well-kept public roadways in Belgium, and nearly 3,000 miles of railway. The length of navigable waters, including canals, is 1,100 miles. The merchant marine comprises 55 vessels. The state's maritime frontier is but 42 miles in length.

Antwerp is the military center of the kingdom, and there is located the chief arsenal and the fortified towns of Dendermonde and Diest. There are many fortifications along the French frontier and along the banks of the Meuse. The standing army is maintained by conscription, as well as by voluntary enlistment. All male citizens over 19 years of age are eligible for conscription. Substitution, however, is permitted and largely practiced. About 13,500 men are required annually. Eight years is the legal term of enlistment, two thirds of which, however, may be allowed on furlough. The total strength of a standing army upon a peace-footing is 52,000; in time of war, 170,000. The chief cities and their population are: Antwerp, 260,000; Brussels, 190,000, with suburbs 500,000; Ghent, 161,000; Liège, 156,000.

BELGRADO, James, an Italian Jesuit, and a distinguished antiquary and mathematician, was born at Udine in 1704; died in 1789. He wrote numerous works in Latin and Italian, mostly on scientific subjects, of which the most important is *Acroasis*

*Critica et Geographica ad Disciplinam, Mechanicam, Nauticam et Geographicam.*

BELGRAND, EUGÈNE, civil engineer, was born at Ewy, Aube, France, April 23, 1810; died in Paris, April 8, 1878. After graduation at the Polytechnique, he entered the department of bridges and highways of Paris. In 1875 he had become inspector-general of the first class, member of the Institute of France and commander of the Legion of Honor. He built the water-works of Paris, whose water is brought from sources 80 to 100 miles distant. At the time of his death he was engaged upon the gigantic work of building the new sewerage system of Paris. He has written *The Seine; The Subterranean Works of Paris; The Basin of Paris in Prehistoric Times;* and other works of a similar nature. See also AQUEDUCT, Vol. II, p. 228.

BELIDOR, BERNARD FOREST DE, French military engineer and writer, was born in Catalonia, Spain, in 1697 or 1693. He was professor of engineering at the artillery school of La Fère, and by his *Dictionaire Portatif de l'Ingénieur*, and his more important work on *Hydraulic Architecture*, gained wide fame, many of the leading engineers of Europe coming to him for instruction. He made many experiments with gunpowder, and proved that nearly one half of the powder used at that time was wasted. He was a prominent member of the Academy of Sciences, and wrote, also, *Treatise on Fortifications; Course of Mathematics for the Use of Artillery; The Science of Engineering;* and other works. He died in Paris, Sept. 8, 1761.

BELKNAP, CHARLES EUGENE, member of the United States Congress, was born in Massena, New York, Oct. 17, 1846; removed with his parents to Michigan in 1855, and was educated in the common schools of Grand Rapids. He left school in 1862 and enlisted in the Twenty-first Regiment, Michigan infantry; was promoted to different positions, and received a captain's commission when but 17. He served until 1865 with the army of the Cumberland, and was wounded seven times; was elected to the Fifty-first Congress, and re-elected to the Fifty-second Congress in 1890.

BELKNAP, GEORGE EUGENE, rear-admiral, United States navy, was born at Newport, New Hampshire, Jan. 22, 1832. He was appointed midshipman from that state, Oct. 7, 1847, and, after a series of promotions, became a commander in 1866. In 1862–64 he commanded the *New Ironsides*, and his handling of this new kind of vessel was much praised. He was engaged in important service during the Civil War, and commanded successively the *Seneca* and the *Canonicus*. After the war he was in command of the *Hartford* and the *Tuscarora*. On the last-mentioned steamer he engaged in deep-sea sounding, for the purpose of finding a route for a submarine cable between Japan and the United States. He was made commodore in 1885, and in the same year became superintendent of the United States Naval Observatory. In 1890 he retired and removed to Brookline, Massachusetts.

BELKNAP, WILLIAM GOLDSMITH, an American soldier, was born at Newburgh, New York, Sept. 7, 1794; died near Fort Washita, Nov. 10, 1851. He fought bravely in the War of 1812 with Great Britain, and in the Indian war in Florida, and was brevetted brigadier-general for conspicuous bravery in the Mexican War. He served on frontier duty until his death.—WILLIAM WORTH BELKNAP, his son, rose during the Civil War from the rank of major to that of brigadier-general. He was born in Newburgh, New York, Sept. 22, 1829; was educated at Princeton College, and entered the war as colonel of the Fifteenth Iowa. He particularly distinguished himself at the battle of Atlanta. He was (1869–76) Secretary of War under Grant, but resigned under charge of corruption. He committed suicide in Washington, District of Columbia, Oct. 13, 1890.

BELL, ALEXANDER GRAHAM, inventor of the speaking-telephone, was born in Edinburgh, Scotland, March 3, 1847; was educated at the high school and University of Edinburgh, and removed to the United States in 1872. Having been specially trained in the removal of impediments of speech, he introduced into this country the system of instruction for deaf mutes invented by his father, Alexander Melville Bell. He is best known for his discoveries in connection with the transmission of sound. While professor of vocal physiology at Boston University he worked out his invention of the telephone, exhibiting it first at Philadelphia in 1876, since which time he has made great improvements in it. He is a member of several scientific societies, and has written extensively on electricity.



ALEXANDER GRAHAM BELL.

BELL, ALEXANDER MELVILLE, the inventor of "visible speech," a system of universal alphabetics for teaching the deaf and dumb, by representing letter-sounds by printed symbols, was born in Edinburgh, Scotland, March 1, 1819. He was for many years a lecturer in the University of Edinburgh, and for some years later at the London University College. He came to America in 1870, and was for many years connected with Queen's College, Kingston, Ontario. He removed to the United States in 1881, and settled in the city of Washington. He has written largely on elocution and on visible speech. See SPEECH-SOUND, Vol. XXII, p. 385.

BELL, CURRER, pseudonym of the authoress, CHARLOTTE BRONTË: q.v., Vol. IV, pp. 364–66.

BELL, HENRY HAYWOOD, rear-admiral United States navy, was born in Orange County, North Carolina, Nov. 17, 1807, and was drowned April 12, 1867, while attempting to cross, in a barge, over the bar at the mouth of the Osaka River, Japan. He entered the navy as a midshipman, Sept. 1, 1823, and at the beginning of the Civil War was in command of the *Brooklyn*, of the West Gulf blockading squadron. Admiral Farragut appointed him fleet-captain in 1862 and with this rank he led the second division of gunboats in the attacks upon Forts St. Philip and Jackson. He showed much ability in the occu-

pation of New Orleans. At the time of his much-lamented death he was in command of the United States squadron of the East Indies.

BELL, Sir Isaac Lowthian, chemist and metallurgist, was born at Newcastle-on-Tyne, England, in 1816. During his career at the University of Edinburgh and at the Sorbonne at Paris he gave his attention largely to the study of physical sciences. After having become prominently connected with extensive chemical works in the county of Durham, he, with his brothers, Messrs. Thomas and John Bell, founded the Clarence Iron-Smelting Works upon the river Tees. From 1875 to 1880 he sat. in Parliament for Hartlepool, and in 1885 was elevated to a baronetcy. The development of the iron industry is largely indebted to the researches and inventions of Sir Lowthian Bell. He is the author of *The Chemical Phenomena of Iron-Smelting*, and other important papers upon metallurgical subjects.

BELL, John, American statesman, was born near Nashville, Tennessee, Feb. 15, 1797; died at Cumberland Iron Works, Tennessee, Sept. 10, 1869. He graduated from the University of Nashville in 1814; then began the study of law, and became a state senator in 1817. In 1827 he was sent to Congress, where he remained for seven terms. He was first a free-trader, but became a protectionist and a founder of the Whig party, He was chosen Speaker of the House in 1834, and took part in several important debates between 1836 and 1838. President Harrison, in 1841, made him Secretary of War, but he resigned when President Tyler left the Whig party. Mr. Bell was sent to the United States Senate, for Tennessee, in 1847, after having spent several years in retirement. Secession was condemned by Senator Bell, but he was not in favor of "coercion," and took no part in the Civil War.

BELL, John, sculptor, was born in Norfolk, England, in 1811. A copy of his allegorical representation of the *United States Directing the Progress of the New World* was sent to the Centennial Exhibition at Philadelphia, and afterward to Washington. The original of this colossal marble group represents the United States in the *Albert Memorial* at Hyde Park, London. Among his other works are *Dorothea; The Last Kiss; The Foot of the Cross; Una and the Lion;* and *Wellington and the Scenes of his Victories.* His *Andromeda Bound to the Rock* is the property of Queen Victoria. He has published several books on sculpture and the allied arts.

BELL, Thomas, English naturalist, was born at Poole, in Dorsetshire, Oct. 11, 1792; died at Selborne, March 13, 1880. He studied medicine at London, and in 1836 was made professor of zoölogy at King's College, in that city. In 1844 he became first president of the Ray Society, and from 1853 to 1861 was president of the Linnæan Society. He is the author of a *History of British Reptiles; History of British Quadrupeds;* and *Monograph of the Testudinata.*

BELLADONNA, an herbaceous plant (*Atropa Belladonna*), of the family *Solanaceæ*, commonly known as "deadly nightshade." It is a native of central and southern Europe, and all parts of the plant are poisonous. The alkaloid (atropia, or atropin) obtained from it is extensively used in medicine. Its power of dilating the pupil of the eye is often taken advantage of by oculists in examinations and operations.

BELLADONNA LILY, a very beautiful species of amaryllis (*A. Belladonna*), with rose-colored, drooping flowers clustered at the summit of the leafless flowering stem. It is a native of the Cape of Good Hope and of the West Indies. The flowering stem is about 18 inches high.

BELLAGGIO, a village and summer resort upon the promontory that separates the two arms of Lake Como, in Lombardy, Italy. It is 15 miles N.E. of Como. Its hotels are considered among the finest in Italy. Permanent population, 3,000.

BELLAIRE, city and railroad center of Belmont County, Ohio, on the Ohio River, five miles from Wheeling, West Virginia. It is an important manufacturing and shipping point. The manufactures include nails, pig-iron, window-glass, flint-ware and agricultural machinery. Population 1890, 9,934.

BELLAMONT, Richard Coote, Earl of, governor of New York and Massachusetts from 1695 until his death upon the 5th of March, 1701. He was born in 1636, and was the son of Baron Coote of the Irish peerage. In 1689 he was elevated to the peerage, having assisted in the dethronement of James II to make room for the Prince of Orange. He was very unpopular in America, on account of the ruthless war which he waged against illegal traders, he himself being suspected of complicity with the famous pirate, William Kidd. His body lies in St. Paul's churchyard on Broadway, New York City.

BELL-ANIMALCULE, the common name for certain ciliated unicellular animals of the family *Vorticellidæ.* Usually the term is applied to the genus *Vorticella.* This is found everywhere in fresh water. The animal consists of a bell-shaped body with a long slender, contractile stalk for attachment to foreign objects. At the end farthest from attachment of the stalk is a flattened disk surrounded by a band of cilia. The bell-animalcules are among the most interesting and beautiful microscopic objects. For illustrations, see Protozoa, Vol. XIX, p. 861.

BELLAMY, Edward, American journalist and romancer, was born at Chicopee Falls, in Massachusetts, March 26, 1850. He was educated at Union College and in Germany; studied law and was admitted to the bar, but did not practice. During 1871–72 he was on the staff of the New York *Evening Post*, and for the five years following was an editorial writer and critic for the Springfield *Union.* His health failing him, he made a voyage in 1876 to the Sandwich Islands, and on his return founded, with others, the Springfield *News.* After two years he abandoned it in order to devote himself entirely to literary work. He has contributed many short stories to the magazines, and, in addition, has published *Six to One: A Nantucket Idyl* (1878); *Dr. Heidenhoff's Process* (1880); and *Miss Ludington's Sister* (1884). His greatest success has been in his socialistic novel, *Looking Backward*, issued in 1888, of which more than 300,000 were sold in America within two years of its first appearance.

Published with no such anticipation, its theories created a widespread agitation, and resulted in the establishment of "Bellamy" communities, after the fashion of the socialistic Utopia described in the book. Mr. Bellamy resides at Chicopee Falls, and interests himself in advancing the ideas of nationalism advocated in *Looking Backward*.

BELLAMY, JOSEPH, American clergyman and educator, was born at North Cheshire, Connecticut, Feb. 20, 1719; died at Bethlehem, Connecticut, March 6, 1790. He graduated at Yale, and at the age of 18 was licensed to preach. He spent his life preaching at Bethlehem, where, about 1742, he established a divinity school, many of whose graduates afterward became men of national repute. He was a powerful pulpit orator and a famous theologian. Some of Dr. Bellamy's works are *True Religion Delineated; The Nature and Glory of the Gospel;* and *The Law Our Schoolmaster*.

BELL-BIRD, a bird of the family *Cotingidæ*, found in South America and the West Indies. Its voice has a peculiar metallic sound, which is said to resemble the ringing of a bell, and can be heard at a distance of three miles. Some species of bell-birds possess a curious tubular appendage on the forehead, which stands erect when inflated with air. See HONEY-EATER, Vol. XII, p. 139.

BELL, BOOK AND CANDLE, the name of a form of excommunication formerly much in vogue in the Church of Rome, The curse, by "bell, book and candle," had appalling significance; the earliest recorded instances were in the twelfth century. The curse was performed with elaborate ceremony and the anathema, founded upon Deut. xviii, 15, was read with due solemnity. See also EXCOMMUNICATION, Vol. VIII, p. 800.

BELLE-DE-NUIT, a name given to certain tropical species of *Convolvulaceæ*, with extremely beautiful and fragrant flowers, which open only during the night. The species to which perhaps the name more particularly belongs is *Ipomæa Bona-Nox*, the moon-flower or evening primrose, a native of the forests of the West Indies and of tropical America.

BELLEEK PORCELAIN. See CERAMIC ART, in these Supplements.

BELLEFONTAINE, a manufacturing town and capital of Logan County, west-central Ohio, is at a railway junction 110 miles N. of Cincinnati and 55 miles N.W. of Columbus. It is noted for its healthfulness and beauty, and has the highest elevation of any town in the state. The manufactures are chiefly woolens, carriages, railroad cars and school desks. Population 1890, 4,245.

BELLEFONTE, capital of Center County, central Pennsylvania, is beautifully situated on Spring Creek, at the foot of Bald Eagle Mountain. It contains manufactories of railroad cars, glass, axes and printing-presses; also a number of foundries, furnaces and rolling-mills. It is 87 miles N.W. of Harrisburg and on two railways. There is here a celebrated spring, from which the town derives its name. Population 1890, 3,946.

BELLEGARDE, a hill fortress of France. Situated on the Spanish confines, on the road from Perpignan to Figueras, and in the pass between Col-de-Portus on the east and Col-de-Panizas on the west, it has belonged alternately to each nation. Here the French under Philip III were defeated by Peter III of Aragon, in 1285. In the fourteenth century it consisted only of a fortified tower, captured by the Spaniards in 1674, and again by the French in 1675. In 1793 it was blockaded and taken by the Spaniards, but was retaken by the French in the following year.

BELLE-ISLE, an island in Conception Bay, on the Atlantic Ocean, is about midway between Newfoundland and Labrador, and gives name to the adjacent strait on the southwest, which forms the most northerly of the three channels between the Gulf of St. Lawrence and the open ocean. The island is fertile; is 9 miles long and 3 broad, and has important fishing industries. Population, 500.

BELLE-ISLE, LOUIS CHARLES ARMAND FOUQUET, COMTE DE, marshal of France, was born at Villefranche, in Aveyron, Sept. 22, 1684; died Jan. 26, 1761. He early distinguished himself in the wars in Italy and in the Low Countries against Spain; afterward he fought with distinction in Poland. In the war of the Austrian succession he stormed Prague in 1741, and in the following year conducted the skillful retreat to Eger. In 1757 he was made war minister, and as such introduced important improvements into the French service. Macaulay said of him: "His whole life was one wild day-dream of conquest and spoliation." See FRANCE, Vol. IX, p. 586.

BELLEL, JEAN JOSEPH, French landscape-painter, was born in Paris, Jan. 28, 1816; studied under Justin Ouvrié, and made his first exhibition at the Salon of 1836. He won a medal of the first class in 1848. Among his works are *Christ and the Samaritan Woman; Macbeth and the Sorcerers; The Flight into Egypt; Souvenir of Provence;* and *Joseph Led into Captivity*.

BELLE PLAINE, a village of Benton County, east-central Iowa, is about 35 miles W. of Cedar Rapids, and 2 miles N. of the Iowa River. It is on two railroads, and contains railroad machine-shops, manufactories of flour and gloves, and is an important center of transportation for grain. Population 1890, 2,623

BELLEROPHON, a genus of extinct gasteropodous mollusks, represented by a great number of species occurring in the Silurian, Devonian and Carboniferous rocks in many parts of the world.

BELLES-LETTRES, a term adopted from the French, and used in a vague way to designate the more refined department of literature. It has no precise limits. In English usage it is synonymous with another vague expression, *polite literature*, including history, poetry, and the drama, fiction, essay and criticism.

BELLEVILLE, a town of France, in the department of the Seine, forming an eastern suburb of Paris, and inclosed by its fortifications. It has manufactories of cashmeres, leather, articles of polished steel and chemical stuffs. There are springs at Belleville which have supplied Paris with water from a very early date, and it has tea-gardens

and other places of amusement much resorted to by the Parisians. Largely inhabited by the poorer classes, it has been a center of communistic agitation. Population, 75,000.

BELLEVILLE, capital of St. Clair County, southwestern Illinois, is 14 miles S.E. of St. Louis, and has numerous railroads. Here is located one of the largest-rolling mills in the Western states. Population 1890, 15,361. See BELLEVILLE, Vol. III, p. 546.

BELLEVILLE, capital of Republic County, north-central Kansas, is on two railroads and in a rich agricultural and mining district. It is 206 miles N.W. of Kansas City. Population 1890, 1,868.

BELLEVILLE, Ontario, Canada, is a thriving town upon the Bay of Quinté, Lake Ontario, 48 miles by rail W. of Kingston. It is the capital of Hastings County, and is a port of entry. The city is well built, and has a number of handsome public edifices. The lumber trade and dairy interests are considerable. A large deaf and dumb asylum, and Albert University, a Methodist institution founded in 1857, are located here. Population 1891, 9,914.

BELLEVILLE, capital of Austin County, southeastern Texas, is 55 miles W. from Houston, with which it is connected by rail. It is 6 miles W. of the Brazos River. There are large manufactories of furniture here. Population 1890, 807.

BELLEVUE, a town of Jackson County, east-central Iowa, is located on a high bank of the Mississippi, 24 miles below Dubuque and 12 miles S. of Galena, Illinois. There are here manufactories of lumber, pumps, flour, and wagons. It is on the Chicago, Milwaukee and St. Paul railroad, and is a popular summer resort and an important center of transportation. Population 1890, 1,394.

BELLEVUE, a manufacturing town of Eaton County, south-central Michigan, is 12 miles by rail N.E. of Battle Creek. It contains important manufactories of lumber, flour and iron. Population 1890, 914.

BELLEVUE, a town in Huron County, north-central Ohio. It is 45 miles by rail S.E. of Toledo, and contains manufactories of carriages, plows and barrels. Large amounts of grain are bought and sold here. Population 1890, 3,052.

BELLEVUE HOSPITAL, New York City, is probably the most widely known institution of its



BELLEVUE HOSPITAL.

kind in the United States. It occupies a long, four-story structure at the foot of Twenty-Sixth Street. It was established in 1826. The Department of Charities and Correction of the city, under whose control it is, expends upon it $100,000 annually.—The medical school, which is connected with the hospital and bears its name, comprises in its faculty the leading members of the medical profession in New York City. The latter institution was established in 1861, and now has about 500 students, The course of instruction is three years in length. and the school is under the same control as the hospital.

BELLIGERENCY. See INTERNATIONAL LAW, Vol. XIII, pp. 191–197.

BELLINGHAM, RICHARD, lawyer, was born in England, 1592; died Dec. 7, 1672. He came to Boston in 1634, being one of the original patentees of the colony, and after seven years was elected governor; again in 1654, and from 1665 up to his death, he held that office; being deputy governor 13 years and governor 10 years. In 1664 he was chosen major-general, and in the same year refused to obey a summons to England to give an account of his administration. Bellingham was an obstinate man, but one who commanded respect. He was intolerant with regard to religious sects which differed from his own. A widowed sister of his was hanged as a witch in 1650.

BELLINGHAM BAY, on the eastern side of Rosario Strait, is in Whatcom County, northwestern Washington. It is 14 miles in length, and 3 in width. In the vicinity is mined the best lignitic coal on the Pacific Coast. The main shaft is but a quarter of a mile from the harbor. The town of Whatcom is the center of this coal trade.

BELLOWS, ALBERT F., *genre* painter, was born at Milford, Massachusetts, Nov. 29, 1829, and died at Auburndale on the 24th of November, 1883. He was a student of architecture at Boston for a few years, but his natural taste led him into painting, and he went to the Antwerp Academy and afterward studied in Paris and London. His professional life was spent in Boston and New York. His early work in oil falls far short of the rank attained by his later water-colors. Of the latter productions are *New England Homestead; The Willow Wagon; Nook; The Thames at Windsor;* and *The Reaper's Child.* Mr. Bellows was a member of the Royal Belgian Society of Water-Colorists, an exceptional honor for an American artist.

BELLOWS FALLS, a manufacturing town in Windham County, southeastern Vermont. It is on the Connecticut River, 22 miles above Brattleboro and 114 by rail N.W. of Boston. The river has at this point a fall of 44 feet in a half-mile, and abundant water-power is furnished to manufactories of paper, farming implements and woolen goods, for which the shipping facilities are excellent. Population 1890, 3,092.

BELLOWS-FISH, a local name for several species of fishes, particularly in Rhode Island, of the angler-fish, and for the trumpet-fish of the Mediterranean and Atlantic coasts of Europe; they are spiny-finned fishes, living near the bottom, and are edible.

BELLOWS, HENRY WHITNEY, Unitarian clergyman, was born at Walpole, New Hampshire, June 11, 1814; died in New York City, Jan. 30, 1882.

He graduated at Harvard, and afterward at the Cambridge Divinity School. He was pastor of a Congregational Church in New York for 43 years. He was editorially connected with the *Christian Inquirer*, *Christian Examiner*, and the *Liberal Christian*. Several notable addresses were made by him on public occasions. He was president of the United States Sanitary Commission, holding office from 1861 to 1878, during which time $15,000,000 in supplies and $5,000,000 in money were distributed according to his directions. He was the author of *Social Diseases* and *Restatement of Christian Doctrine*.

BELLOY, PIERRE LAURENT BUIRETTE, dramatist, was born at Saint-Flour, southern France, in 1727, and died in Paris, March 5, 1775. His first important work was his tragedy, *Titus*, which was presented in Paris in 1758. Shortly afterward he went to St. Petersburg, where he had appeared upon the stage some years earlier. He was one of the first of the Romanticist school who placed a modern instead of a classical setting upon the stage. He is best known by his tragedy, *Siege of Calais*, which so delighted the people of Calais that they sent him the freedom of the city in a gold box. Belloy was a member of the French Academy.

BELLO Y LOPEZ, ANDRES, poet and prose writer, was born at Carácas, Venezuela, Nov. 29, 1781, and died in Santiago, Chile, Oct. 15, 1865. He is regarded the foremost Spanish-American author of the nineteenth century. In 1799 he met, in Venezuela, Alexander Von Humboldt, the famous traveler and scientist, whom he accompanied upon a number of expeditions. In 1808 he became secretary and interpreter for the Governor and Council of Venezuela. Two years later he participated in his country's revolt against Spanish domination, and toward the end of 1810 he accompanied Bolivar, his friend and former pupil, to London. There, enduring many hardships through the varying fortunes of his country, he continued a constant and earnest student of literature. In 1829 he accepted an offer made him by the government of Chile, and after 14 years' residence in that country he became the first rector of the University of Chile, which office he held until his death. His writings are extensive and various. In defense of the use of the pure Castilian tongue, he wrote *Principios de la Ortologia y Métrica de la Lengua Castellana;* as a jurist he was the author of *Código Civil;* and *Principios de Derecho de Gentes;* his *Filosofia del Entendimiento* showed his deep meditation upon philosophical questions. His fame, however, depends chiefly upon his poems, which are written in a vigorous and elevated style. These are included in his *Obras Completas*, which were published after his death, and at the expense of the Chilean government. There was universal mourning for his death. His statue, erected by popular subscription, adorns the front of the main entrance to the Congress building in Santiago.

BELL ROCK OR INCHCAPE, an Old Red Sandstone reef in the German Ocean, 12 miles S.E. of Arbroath, Scotland, and almost opposite the mouth of the Tay. It is 2,000 feet long, and at spring tides part of it is uncovered to the height of 4 feet, the sea being only 3 fathoms deep for 100 yards around. In early times it was the scene of numerous shipwrecks, and the abbot of Aberbrothock (Arbroath) placed a bell on it, "fixed upon a tree of timber, which rang continually, giving notice to the saylers of the danger." Robert Southey has embodied the local tradition of a certain "Ralph the Rover" carrying off this bell, in his poem, *The Inchcape Rock*, wherein the rover suffers shipwreck upon the rock he had so wantonly despoiled. The necessity of erecting a lighthouse upon this rock was painfully shown in 1799, when some 70 vessels were wrecked in this vicinity, during a severe gale. In consequence, the Commissioners of the Northern Lighthouses directed Robert Stevenson (q.v., Vol. XXII, p. 545), grandfather of the novelist, Robert Louis Stevenson, to erect the present lighthouse. It was completed between 1807 and 1810, is 120 feet high, and cost $306,655. See also LIGHTHOUSE, Vol. XIV, p. 616.

BELLS. For general article on bells, see BELLS, Vol. III, pp. 536–539. American bells are now found in all quarters of the globe. The special aim of bell-founders in the United States is to produce the greatest volume and prolongation of tone, combined with the best quality of sound and the highest traveling character, from the least weight of metal, and these results have been attained to such degree as to secure to the trade a greatly extended and rapidly increasing patronage. American manufacturers may be congratulated upon the generally acknowledged fact that their bells are uniformly designed and cast with superior excellence in all these respects. As the musical qualities, purity and beauty of tone and power that distinguish the best bells from those of an inferior class depend largely on the purity of the material used, the greatest care is taken as to the selections made.

The largest bell made in the United States weighed 22,000 pounds, and before it was fractured hung in the City Hall, New York. On some occasions it was heard 13 miles up the Hudson River, but that date was before the upper part of Manhattan Island was covered with structures varying from 4 to 20 stories in height. The largest bell in Canada is that of Notre Dame Cathedral, Montreal, weighing 29,400 pounds. The reference catalogues of American dealers would present extended lists showing a great number of large bells throughout the country, ranging in weight from 8,000 pounds to 17,000 pounds. As a list of the largest bells of the Old World is given in detail in Vol. III, it is omitted here, but the reader will be gratified to find here a correct illustration of the bell of Moscow, the greatest ever constructed, whose weight was such that it was never hung.

The bell bears an inscription stating that the first great bell was cast in 1553, and weighed 36,000 pounds; during the reign of the Czar Alexis it was ruined by fire, and in 1654, with additional metal, was recast into the second great bell, the weight of which was 288,000 pounds; that this second bell was in 1706 also destroyed by fire, and in 1733, with still more metal, was recast by order of the Empress Anne into the present great bell, which measures 22 feet

8 inches across the mouth, 19 feet 3 inches in height, and weighs (estimated) about 440,000 pounds.* It seems to have been cracked in cooling; a nearly triangular-shaped piece of about 6 feet in height and 7 feet at the base, and weighing about 11 tons, was broken out at the rim, and now stands on the ground just below the opening thus formed.



THE GREAT BELL OF MOSCOW.

When the great bell was placed in its present position it was intended for service as a chapel, and for that purpose an opening was left through the pedestal-wall, which, with the opening in the bell above it, forms an imposing entrance.

To the list in Vol. III, p. 539, should be added the new bell of St. Paul's in London, commonly known as the "Great Paul." It was raised to its place May 31, 1882, and dedicated with imposing ceremonies three days later. It is 8 feet 10 inches in height, and 9 feet 6¾ inches in diameter, and weighs 17½ tons. Its note is E flat; materials, copper and tin; and its cost, about $15,000.

BELLS, a nautical phrase, corresponding to the time of day as indicated by clocks on land. The solar day of 24 hours is divided into 6 watches of 4 hours' duration each. These watches begin at 12, 4 and 8 o'clock of both day and night. The time is announced by striking a stationary bell with a pendant clapper half-hourly, the strokes beginning with 1, sounded 30 minutes after the commencement of the watch, and increasing up to 8 strokes at the termination of 4 hours, the end of the watch. Thus the half-hours are announced by odd-numbered strokes of the bell, the full hours by even-numbered strokes.

BELLWOOD, a town of Blair County, south-central Pennsylvania, is on the Pennsylvania and Pennsylvania and North-Western railroads, and is 9 miles N. of Altoona. The most important industrial establishments are railroad car repair-shops and foundries. Population 1890, 1,146.

BELLWORT, a name applied in general to the species of the genus *Campanula*, of the family *Campanulaceæ*, whose often beautiful bell-shaped blue flowers have suggested the name; also called "harebells." The name is also applied to the species of the genus *Uvularia*, of the family *Liliaceæ*, whose nodding yellow flowers appear early in the spring.

BELMONT, a village in Mississippi County, south east Missouri, on the Mississippi River, opposite Columbus, Kentucky, and about 20 miles S. of Cairo. It is mainly interesting as the scene of the first battle of the Civil War in which Gen. U. S. Grant participated. Descending the Mississippi with a force of about 3,000 men on Nov. 7, 1861, he attacked the Confederate supply camp at Belmont, garrisoned by some 3,000 men, and after some sharp skirmishing carried the camp by assault, put the enemy to flight, destroyed the military stores and captured two guns and 175 prisoners. The Confederates, reinforced by General Polk's command, in turn attacked Grant, but he managed to regain his boats without loss of men or baggage and returned to Cairo. The loss on each side in the battle was about 500 in killed, wounded and missing.

BELMONT, capital of Allegany County, southwestern New York, is situated upon the Genesee River; is midway between Dunkirk and Elmira, and 62 miles S.E. of Buffalo. The town is easy of access by a number of railways. Allegany County is very fertile and well farmed. Belmont has large flour-mills, machine-shops and foundries. Population of township 1890, 1749.

BELMONT, AUGUST, financier, was born at Alzey, Germany, in 1816; died in New York City, Nov. 24, 1890. He was educated in Frankfort; entered the employ of the Rothschilds in 1830, and came to New York in 1837 as their agent. He soon began to prosper; and at the age of 40 was a millionaire. In 1844 Mr. Belmont was appointed consul-general by the Austrian government, and this office he held six years. He was sent by President Pierce as minister to The Hague, and from 1860 to 1872 was chairman of the national Democratic convention. He was of the opinion that the Southern states should be allowed to secede, thinking they would soon be glad to come back into the Union. The event of war proved Mr. Belmont in error, and caused him to change his views and advocate the prosecution of the war. He had such an influence abroad that he prevented the Confederacy from obtaining credit in the foreign money market. While in Europe he was of great assistance to the Union cause, and furnished valuable information to Secretary Seward. Mr. Bel-



AUGUST BELMONT.

* This weight is just double that of the largest bell now in use in the world, viz., that suspended above the chapel of St. Nicholas, in the Kremlin, in Moscow, weighing 220,000 pounds. This was cast in 1817. It is said that the sound, when the bell is rung, which is only once a year, is "a deep, hollow murmur, vibrating all over Moscow like the rolling of distant thunder."

mont was a lover of art and made a large collection of paintings. For years he was noted as a breeder of fine horses.

BELOIT, capital of Mitchell County, north-central Kansas, is upon the Solomon River, and at the junction of two railroads. It is the seat of the State Industrial School for girls. Large amounts of white magnesian limestone are quarried near Belmont. Population 1890, 2,455.

BELOIT, a city of Rock County, south-central Wisconsin, situated on both sides of Rock River, immediately north of the boundary line of Illinois; it is 47 miles by rail S.E. of Madison and 91 miles N.W. of Chicago, Illinois. It is the seat of Beloit College, the center of an extensive farming and dairying district, and the headquarters of important manufactures, including paper, reaping and mowing machines, water-wheels, plows and machinery. Population 1890, 6,315.

BELOIT COLLEGE, an institution of learning at Beloit, Wisconsin, was founded in 1846 by the



HALL OF SCIENCE, BELOIT COLLEGE.

Presbyterians and Congregationalists of Wisconsin and northern Illinois. The Rev. Aaron L. Chapin (Yale, 1837), the first president, was succeeded in 1886 by the Rev. Edward D. Eaton (Beloit, 1872), who is still at the head of the institution. Beloit is a college of the New England type and has a faculty of 25 professors and assistants. There are about 450 students in attendance. Most of the 10 buildings of the college are built upon a hill which overlooks Rock River. All courses of the college are open to women.

BELOT, ADOLPHE, French novelist and dramatist, was born in the island of Guadaloupe, Nov. 6, 1829, and died in Paris, Dec. 17, 1890. He became an advocate at the bar of Nancy in 1854. His first attempt in literature was *Châtiment* (Paris, 1855), a novel which failed to attract attention. Two years later he brought out *À la Campagne*, a one-act comedy which gave no indication of the immense and lasting success of his second dramatic composition, *Le Testament de César Girodot*. M. Belot has written a large number of other dramas, *L'Article 47; Miss Multon; Le Pavé de Paris*, etc. He is also author of numerous novels, some of which are remarkable only for their erotic tendencies. The most noted of these is *Mademoiselle Giraud, ma Femme;* others are *La Reine de Beauté; La Princesse Sophie;* and *Alphonsine*. He also contributed to the Parisian daily press many short articles which attracted great attention.

BELPER, an English market town, in Derby County, on the Derwent. It is on the Midland railway, 10 miles N. of Derby, and contains important manufactures of silk and cotton hosiery. It contains the remains of the mansion which was at one time the dwelling-place of John of Gaunt. Population 1891, 10,420.

BELTON, capital of Bell County, central Texas, is on Little River; is 60 miles N. of Austin, and 40 by rail S.W. of Waco. It has a Masonic Institute, the Chamberlain Institute, and Baylor Female College, the oldest in the state; large cottonseed-oil and flour mills are here. Population 1890, 3,000.

BELUGA OR WHITE WHALE (*Delphinapterus leucas*). See MAMMALIA, Vol. XV, p. 399; WHALE, Vol. XXIV, p. 525.

BELUS OR BEL, TEMPLE OF an enormous structure in ancient BABYLON; q.v., Vol. III, p. 183.

BELVEDERE, in architecture, an Italian word meaning, originally, a pavilion on the top of a house or other structure, built so as to afford a view of the surrounding country. It is still understood in this sense in Italy. A part of the Vatican in Rome is known as the Belvedere, and gives name to the famous statue of Apollo. In France the word has come to signify any kind of summer-house or place of refreshment, always with the idea, however, of the command of a fine prospect of country.

BELVEDERE, an annual plant of the family *Chenopodiaceæ*, a native of the middle and south of Europe and of Asia, familiar in gardens as an ornamental annual, not on account of its flowers, which have no beauty, but on account of its close, pyramidal, rigid form and numerous narrow leaves, which make it appear like a miniature cypress tree. It is sometimes called "summer cypress."

BELVIDERE, a manufacturing town and the capital of Boone County, north-central Illinois. It is upon the Kishwaukee River, and 78 miles N.W. of Chicago, with which the Chicago and North-Western railway connects it. Several fine churches ornament the town, and there are a number of flour-mills and manufacturing establishments. Population 1890, 3,867.

BELVIDERE, a town, the capital of Warren County, northwestern New Jersey, at the junction of the Delaware River and Pequest Creek, on the Pennsylvania and Lehigh and Hudson railroads. There is a bridge across the Delaware. Abundant water-power is furnished for cotton and flour mills and a carriage factory. The surrounding region furnishes iron ore, limestone, slate and magnesia. Population 1890, 1,768.

BELVISIA (now called *Napoleona*), a genus of small trees of the family *Myrtaceæ*, natives of tropical Africa. They have smooth, simple, leathery leaves; the beautiful and very curious flowers, growing in threes, being sessile in the axils of the leaves. The calyx is a thick leathery cup divided into five ovate segments. The corolla is composed of three distinct rings; the outer one five-lobed, and furnished with ribs, by means of which it is strongly plaited,

turning back and hiding the calyx when full-blown; the second, a narrow membrane, divided into numerous regular segments like a fringe; the third, an erect cup-shaped membrane. The erect stamens resemble another cup. The ovary is five-celled, each cell containing two ovules; the short, thick style is five-angled, with a broad, flat stigma of as many angles. The fruit is a soft berry, crowned with the calyx, with large kidney-shaped seeds. These plants are now grown in conservatories.

BEM, JOSEPH, a Polish general; born at Tarnow, in Galicia, in 1795; died in Aleppo, Dec. 10, 1850; was commander of the army in Transylvania during the Hungarian revolution. After a course of military adventure in Poland he went to France, where he resided for a considerable time. In 1848 he joined the Hungarians and was intrusted with the command of the army of Transylvania. He defeated the Austrian army and succeeded in driving their allies, the Russians, back to Wallachia. Having thus made himself master of Transylvania, at Kossuth's request he hastened into Hungary, where he took part in the unfortunate battle near Temesvar. He made his escape into Turkey, where he embraced, from political motives, the profession of Islam; he was raised to the dignity of a pasha and obtained a command in the Turkish army. In 1850 he was sent to Aleppo, where he died, after suppressing the sanguinary insurrection of the Arabs against the Christian population. He was, in private life, characterized by a benevolent disposition, and as a military leader distinguished by courage, presence of mind in extreme danger and remarkable rapidity of movement.

BEMBATOOKA OR BOMBETOK, BAY OF, a safe and commodious bay on the northwest coast of Madagascar. The Betsiboka River, navigable for 90 miles, flows into it. On the south side of the bay is the village of Bembatooka, where prime bullocks are sold, and bought extensively by agents of the French government, who have them driven to Fort Dauphin, on Antongil Bay, on the opposite side of the island, where they are killed and cured for the use of the French navy, and for colonial consumption. Majunga, on the north side of the bay, is a town of 14,000 inhabitants.

BEMBECIDÆ, a family of hymenopterous insects usually found in warm countries. They are known as sand-wasps. The female commonly deposits her eggs in the sand, and at the same time provisions the nest with various flies. There are several species in the United States.

BEMIS, EDWARD WEBSTER, political economist, born in Springfield, Massachusetts, April 7, 1860; was graduated at Amherst College in 1880; received his doctor's degree from Johns Hopkins in 1883; engaged in university extension lecturing at St. Louis, Buffalo and other places in 1887–88, the term *University Extension* being used for the first time in connection with his lectures, as applied to this method of popular education. From 1889 to 1892 he was professor of economics and history at Vanderbilt University, Nashville, Tennessee; and from 1892 to November, 1895, associate professor of economics at the University of Chicago. Since that time he has been engaged in independent research and lecturing. He has written *Municipal Ownerships of Gas in the United States; History of Co-operation in the United States;* etc.

BEMIS HEIGHTS OR BEMUS HEIGHTS, a village in Saratoga County, eastern New York, on the west bank of the Hudson River, 24 miles above Albany; famous for having been the place where occurred the first battle of Stillwater, Sept. 19, 1777, in which Generals Gates and Burgoyne were the opposing commanders. Population 1890, 121.

BEN, a Hebrew word signifying "son," and forming the first syllable of many names, ancient and modern, as Benhadad, Benjamin, etc. The corresponding Arabic word, *Ibn* or *Ebn*, in like manner enters into the composition of a great number of names, as Ibn Sina, Ibn-al-Faradhi, etc. Ibn, in some of its constructive forms, drops the initial vowel, thus nearly corresponding to the Hebrew, as *Jusuf-ben-Yakub* (Joseph, the son of Jacob).

BEN, a term of Gaelic origin, prefixed to the names of the principal mountains of Scotland, as Ben Ledi, Ben Lomond, etc. It is essentially the same as the Welsh *pen*, the primary signification of which is "head," and hence it may be considered as equivalent to "mountain head." The term *Pennine*, applied to a division of the Alps, is doubtless derived from the Celtic *pen* or *ben*, and even the name *Apennines* is in all probability from the same root.

BEN, OIL OF, a fluid, fixed oil, obtained from the seeds of a tree found in India and Arabia, and known as the horse-radish tree (*Moringa pterygasperma*). The seeds are called ben-nuts, and are roundish, with three membranous wings. The oil, which is odorless and nearly colorless, is used by watchmakers because it does not readily freeze, and by perfumers as the basis of various scents. Other oils are often adulterated with it.

BENATEK OR BENATKY, a town of Bohemia, on the right bank of the Iser, 21 miles N.E. of Prague. It is worthy of note as being for a time the residence of the celebrated astronomer, Tycho Brahe. Population 1890, 1,568.

BENBECULA, one of the Hebrides or Western Isles of Scotland, between North and South Uist, 20 miles W. of Skye, and belonging to Inverness-shire. It is 8 miles long and 8 broad, low and flat, and consists chiefly of bog, sand and lake, resting on a substratum of gneiss rock, with a very broken coast-line. Population 1891, 1,563, consisting of fishermen and farmers, who fertilize the soil with the seaweed which is cast ashore on the island.

BENCH-WARRANT is the process or writ issued against a person charged with the commission of a crime or contempt of court. Such process may be issued by a judge while on the bench (from which comes the name *bench-warrant*) or by a judge at chambers. A bench-warrant is an intermediate or interlocutory process upon which the person against whom it is issued is arrested and taken before the court to stand for trial for the offense charged, and may be issued when the person charged has been indicted by the grand jury; when he has been charged with crime by a sworn complaint setting

forth the charges made, or when the offense has been committed in the presence of the court. See WARRANTS, Vol. XXIV, p. 371.

BENDA, GEORG, the most distinguished of a notable musical family; born at Jungbunzlau, in Bohemia, in 1721; died at Kostritz in 1795. He excelled as a pianist, violinist and composer; was bandmaster to the Duke of Gotha from 1748 to 1787, and in this period produced several operas and cantatas, such as *Ariadne auf Naxos* and *Medea*. His *Ariadne auf Naxos*, written in 1774, entitles him, according to some critics, to be called the inventor of the melodrama.

BENDEMANN, EDWARD, a painter of the Düsseldorf school; born in Berlin, Dec. 3, 1811; died at Düsseldorf, Dec. 27, 1889. He received a careful scientific education, but devoted himself to art; became a pupil of Schadow, and soon proved that he was not mistaken in his vocation. When he was but 20 years of age his picture of the *Captive Jews* was exhibited at Berlin, and at once acknowledged to be a masterpiece. His next important work, in 1833, represented *Two Girls at a Fountain*, followed in 1837 by *Jeremiah at the Ruins of Jerusalem*, a picture for which he obtained a prize medal at Paris. His pictures are distinguished by a grace and charm arising from symmetry in drawing and composition, *naïveté* in conception, and a tender, harmonious, yet always truthful, coloring. In 1838 he was a professor at the Academy of Arts at Dresden. He was director of Düsseldorf Academy from 1859 to 1867.

BENDIGO, a county in the Loddon district, Victoria, Australia; area, 1,949 miles; chief town, Sandhurst, sometimes known as Bendigo. Gold was discovered in 1851, and the county is now one of the most productive gold-fields in the colony of Victoria. It is about 25 miles to the north of Mount Alexander, which, again, is about 75 miles inland from Melbourne. Population 1890, 56,653.

BENDIRE, CHARLES EMIL, United States army officer and ornithologist; born at Darmstadt, Germany, April 27, 1836; emigrated to this country in 1852; entered the army in 1854 as a private; remained in the army until retired, with the rank of captain, April 24, 1886. Became an authority in oölogy, and is recognized as such to-day. He presented the United States National Museum with its largest single collection of North American birds' eggs. He is the author of *The Life Histories of North American Birds, with Special Reference to their Breeding, Habits and Eggs* (Vol. I, 1892).

BENE, a town in the province of Mondovi, Piedmont, Italy, 18 miles N.E. of Coni. It occupies the site of the ancient Augusta Bagiennorum, destroyed by Alaric. Many interesting vestiges are found in the neighborhood, and the ruins of an aqueduct, baths, and amphitheater are still visible. Population 1891, 6,426.

BENEDEK, LUDWIG VON, an Austrian general; born at Odenburg, Hungary, in 1804; died at Gratz, April 27, 1881. He received a military education; entered the army as ensign in 1822, and became distinguished for gallantry and skill. He served against the Italians in 1848–49 as colonel and against the Hungarian patriots in 1849 as general. He was governor of Hungary in 1860, and in 1866 was made commander-in-chief of the Austrian army. After the defeat at Sadowa he was brought before a court-martial, and although the proceedings were quashed by the emperor, Benedek never recovered from the savage criticisms of his mortified and defeated countrymen. See AUSTRIA, Vol. III, p. 140.

BENEDETTI, VINCENT, COUNT, a French diplomatist; born in 1817, at Bastia, in Corsica; was appointed, in 1855, director of political affairs to the foreign minister, and in this capacity edited the protocols of the Congress of Paris in the following year. He was appointed ambassador at Turin in 1861, and at Berlin in 1864. Benedetti will be chiefly remembered as the writer of the remarkable draft of a secret treaty between France and Prussia, published in 1870, at the outbreak of the war. Of this war he was the immediate instrument, as conveying the imperative demands of France. In a pamphlet issued at Paris in 1871, *Ma Mission en Prusse*, he throws the whole responsibility on Bismarck. On the fall of the empire he retired to Corsica, and practiced law at the bar of Ajaccio.

BENEDICITE, or the Song of the Three Children, is the canticle used in the Anglican service after the first lesson in the morning, alternatively with the *Te Deum*, at the option of the minister. It is taken from the Greek continuation of Daniel iii, as the song sung by the three Israelites, Shadrach, Meshach and Abednego, when they were cast into the fiery furnace by Nebuchadnezzar. See also HYMNS, Vol. XII, p. 589.

BENEDICT, BISCOP, an ecclesiastic; born in England in 629; died Jan. 2, 690. His influence upon Anglo-Saxon civilization and learning was most important. Until about the year 654 he served at the court of Oswin, king of Northumberland, after which he spent about ten years at Rome in study. In 665 he returned to Rome on a mission for Alchfrith, king of Northumbria, and was made abbot of the monastery of St. Peter, at Canterbury, after his return to England in 668. In 675 he imported workmen from France to make glass for his monastery, and thus started or revived the glass-making industry in England. He also brought bells from Italy in 680, and thus introduced the use of church bells in England. He purchased, in France, a valuable collection of books, and went to Northumbria, where he founded the famous monastery of Wearmouth on a piece of land near the mouth of the Wear, presented to him by King Ecgfrith. See BEDE, Vol. III, p. 481.

BENEDICT, SIR JULIUS, musician and composer; born in Stuttgart, Germany, Nov. 27, 1804; died in London, June 5, 1885. In 1836 he took up his residence in England. He was musical director of the Kärnther Thor Theater, Vienna, in 1824; and later on occupied the same position at Naples. In Paris, and afterward in London in 1835, he appeared with great success as a pianist. In 1850 he conducted at Jenny Lind's concerts in America. He was knighted in 1871. Among his musical compositions which attained popularity are *The Gypsy's Warning; The Crusaders; The Lily of Killarney; St. Cecilia;* and *The Bride of Song.*

BENEDICT, MORITZ, Austrian neurologist; born in Eisenstadt, Hungary, July 6, 1835; graduated at the University of Vienna in 1859; appointed professor of nervous pathology in the University of Vienna in 1868; has published *Nervenpathologie* and *Elektrotherapie*.

BENEDICTINES. See BENEDICTINES, Vol. III, p. 558, and Vol. XVI, pp. 704 et seq. An account of the Benedictines, as affecting the history of England, is given in Vol. VIII, pp. 372 et seq. Their historical monasteries are described in the article ABBEY, and their libraries in Vol. XIV, p. 513. The Benedictines in the United States are known as the American Casinensian Congregation. The parent organization is the house at Latrobe, Pennsylvania, founded in 1846 as the monastery of Saint Vincent, and raised in 1855 to the dignity of Abbey of Saint Vincent. It is under the jurisdiction of a mitered abbot appointed by the pope, and under the same general supervision is a large and increasing number of monasteries. The abbey of Saint Meinrad, Indiana, which was founded in 1853, is a filiation of the celebrated Benedictine abbey at Einsiedeln, in Switzerland. The first convent of Benedictine nuns in the United States was established at Saint Mary's, Pennsylvania, in 1853.

BENEDICTION (Lat. *benedicere*, to speak well) a solemn invocation of the divine blessing upon men or things. The simplest form of this ceremony may be considered as almost coeval with the earliest expression of religious feeling. The Jewish patriarchs, before they died, invoked the blessing of God upon their children, and later on the priests were commanded to solicit divine blessing upon the people. In the Eastern as well as in the Western church it is regarded as an essential preliminary to almost all important acts. See also TARGUM, Vol. XXIII, p. 62, note 9.

BENEDICTUS, the song of Zacharias, father of John the Baptist, taken from Luke i, 68–79, which is the canticle appointed, alternatively with the *Jubilate*, to follow the lessons in the morning service of the Anglican Church. It has been set to music by all the most eminent composers.

BENEDIX, JULIUS RODERICK, German dramatist; born at Leipsic, Jan. 21, 1811; died there, Sept. 26, 1873. Of his numerous pieces, the best are his comedies, most of which are popular in Germany. His dramatic works fill 27 volumes. Among his comedies are *Der Störenfried*, *Bemoostes Haupt*, etc.

BENEFICIARY. A beneficiary is one who is entitled to the benefits of a contract or an estate held by another in trust for him. The technical legal term in general use is *cestui que trust*, but, at the suggestion of Judge Story, the term *beneficiary* has come into frequent use as a substitute, and is perhaps more appropriate.

BENEFIT OF CLERGY. See CLERGY, BENEFIT OF, Vol. V, p. 827.

*BENEFIT SOCIETIES, MUTUAL. These societies are also known under the name of friendly or fraternal societies. It is very difficult to classify properly all the organizations which may be brought under these titles. At the time of the eleventh census of the United States an attempt was made to secure information concerning all these fraternities. Most of them came into existence during the past twenty years. Many died after a very brief career, but the census officers found at least 2,129 different societies, although many of these were subordinate branches of a national organization. Of the 2,129 organizations for which the census obtained data, 1,040 furnished financial statements suitable for compilation, and these reported 3,035,435 members on Dec. 31, 1889. The aggregate income of the number which furnished financial statements for the same year was $40,664,412, while the expenditures were $37,051,793. Attempts have been made independently of the census to secure information concerning fraternal societies or mutual benefit organizations, the chief effort having been made by the great almanacs, and more especially by the New York *World*. Supplementing that information by data collected especially for this article, it is found that the chief organizations in the country which can be classed as mutual benefit or fraternal societies are as follows, the list giving names and the date of foundation of the separate societies:

| NAME OF ORGANIZATION. | FOUNDED. |
|---|---|
| American Legion of Honor | 1878 |
| Ben Hur, Tribe of | 1894 |
| B'nai B'rith, Independent Order of | 1843 |
| Brith Abraham Order | 1859 |
| Catholic Benevolent Legion | 1881 |
| Catholic Knights of America | 1877 |
| Catholic Mutual Benefit Association | 1876 |
| Chosen Friends, Order of | 1879 |
| Druids, United Ancient Order of | 1839 |
| Elks, Benevolent and Protective Order of | 1868 |
| Equitable Aid Union | 1879 |
| Foresters, Ancient Order of | 1832 |
| Foresters, Ancient Order of, of America | 1874 |
| Foresters, Independent Order of | 1874 |
| Golden Chain, Order of | 1881 |
| Golden Cross, United Order of | 1876 |
| Good Fellows, Royal Society of | 1882 |
| Heptasophs, Improved Order | 1878 |
| Hibernians of America, Ancient Order of | 1836 |
| Home Circle | 1879 |
| Independent Order Free Sons of Israel | 1849 |
| Irish Catholic Benevolent Union | 1869 |
| Knights and Ladies of Honor | 1877 |
| Knights of Honor | 1873 |
| Knights of Pythias | 1864 |
| Knights of St. John and Malta | 1883 |
| Knights of the Golden Eagle | 1873 |
| Knights of the Maccabees | 1881 |
| Mystic Circle, The Fraternal | 1884 |
| National Provident Union | 1883 |
| National Union | 1881 |
| New England Order of Protection | 1887 |
| Odd Fellows, Grand United Order of, of America | —— |
| Odd Fellows, Independent Order of | 1819 |
| Pilgrim Fathers, United Order of | 1879 |
| Rechabites, Independent Order of | 1842 |
| Red Men, Improved Order of | 1771 |
| Royal Arcanum | 1877 |
| Royal Templars of Temperance | 1870 |
| Scottish Clans, Order of | 1878 |
| United American Mechanics, Order of | 1845 |
| United American Mechanics, Junior Order of | 1853 |
| United Friends, Order of | 1881 |
| United Workmen, Ancient Order of | 1868 |
| Woodmen of America, Fraternity of Modern | 1883 |
| Woodmen of the World | 1890 |

There are various sub-lodges under most of the organizations named in the foregoing list, but nearly all comprehend in it work on the lodge plan;

*Copyright, 1896, by The Werner Company.

that is, they have for their object the insurance of the lives of members and the rendering of pecuniary aid in case of sickness or injury to person or property, and many of them pay benefits to the family in case of the death of a member. The lodge feature is absolutely a necessary characteristic of such organizations, many of them working with complete lodge systems, including a ritual and degrees. Others, however, are without degrees, and some of those which originally worked with the degree method have abandoned it.

From the latest information obtainable it is certain that the membership of the organizations named in the foregoing list, including, of course, all the principal and subordinate lodges or branches, is over 5,000,000, and that the total amount of benefits paid since the organization exceeds $450,000,000. The annual disbursements of these societies at present amount to between $35,000,000 and $40,000,000. Among those which have paid out the largest amount of money in total benefits since organization are the Ancient Order of United Workmen, with nearly $60,000,000 to its account; the Knights of Honor, with more than $52,000,000; the Independent Order of B'nai B'rith, with nearly $40,000,000; the Royal Arcanum, with over $33,000,000; the American Legion of Honor, with nearly $32,000,000; the Improved order of Red Men, with over $12,000,000; the Knights and Ladies of Honor, with upwards of $10,000,000; the Ancient Order of Foresters (American branch), with nearly $4,000,000, while the whole order, including this and the other countries, has paid out over $90,000,000 in benefits. The Independent Order of Odd Fellows has paid for sick and funeral benefits and care of widows and orphans probably $75,000,000; the Royal Templars of Temperance has paid out nearly $7,000,000 in benefits; the Fraternity of Modern Woodmen of America, about the same; the National Union, over $6,000,000; the Order of Chosen Friends, nearly $10,000,000; the Catholic Mutual Benefit Association, nearly $7,000,000; Catholic Knights of America, about the same; the Catholic Benevolent Legion, over $6,000,000; the Independent Order of Foresters, over $3,000,000; the Independent Order of Free Sons of Israel, over $5,000,000; the Knights of Maccabees, $6,000,000; the United Ancient Order of Druids, nearly $4,000,000; the Ancient Order of Hibernians of America, nearly $4,000,000; and so the record goes, there being many orders which have paid out in the vicinity of a million dollars each.

The membership of some of these societies or orders marks their prosperity. The Odd Fellows claim nearly 1,000,000, the Knights of Pythias nearly 500,000, the Ancient Order of United Workmen nearly 350,000, and the Knights of the Maccabees nearly 250,000.

The vast sums paid out annually indicate the influence of these mutual benefit organizations on the business affairs of the country. The moral influence cannot be estimated. They nearly all hold their members to very strict observance of principles, and deal severely with infringements thereon. They throw around their members a social and truly fraternal protection which cannot be expressed in figures. Some of them are secret societies in a certain sense, but only so far as their lodge meetings are concerned,—as a rule, their business being open to public inspection. They do not hide their heads, but stand as representatives of a certain form of insurance which is allied to social and friendly intercourse. The educational influence of these associations is great. At their stated meetings, while discussing affairs peculiarly pertinent to their own organizations, they take up many other matters, literary, musical and otherwise, for the instruction and edification of their members.

While many of the fraternal societies have some of the features of the modern assessment life insurance associations, like the Knights of Honor and the Royal Arcanum, which issue a regular policy of insurance on the life of a member, they also have other features which take them out of a classification with assessment insurance companies. The lodge accompaniment and all the social and fraternal characteristics of these associations distinguish them from the purely assessment insurance companies. To be sure, those of the organizations named above which issue a policy of life insurance make an assessment whenever a member dies, in order to pay the policy. So far their business methods are like the assessment insurance companies, but beyond that they have other distinctive features, which have been named, and which give them a classification of their own.

These fraternal societies have not injured the old form of life insurance, as was expected when they began to grow and expand a few years ago. On the other hand, it is conceded by many interested in the ordinary life insurance companies that the benefits derived from life insurance have been brought home to the people through the peculiar methods of the fraternal societies, and in such a way as to stimulate the business of life insurance. So many little homes have been made comfortable through the payment of a small policy of a thousand dollars, or two thousand dollars, or whatever it may be, that the friends and acquaintances of the deceased member of a fraternal society have had brought before them an effective object-lesson; thus the fraternal societies have stimulated the growth of the life insurance business of the world. CARROLL D. WRIGHT.

BENET, STEPHEN VINCENT, writer and soldier; born at St. Augustine, Florida, Jan. 22, 1827; graduated at West Point in 1849; assistant professor of geography, history and ethics at West Point in 1859–61; ordnance instructor in 1861–64; ordnance inspector in 1864; in command of Frankford Arsenal up to 1869, when he was advanced one rank after another up to chief of ordnance in 1874, with the rank of brigadier-general. He retired in 1891. He published *Electro-Ballistic Machines and the Schultze Chronoscope; Military Law and the Practice of Courts-Martial;* and a translation of *Jomini's Political and Military History of the Campaign of Waterloo.*

BENEVOLENCE, a name applied to a forced loan or contribution, levied by kings of England without legal authority. It was first so called in

1473, when asked from his subjects by Edward IV, as a mark of good will toward his rule; but similar compulsory "free-will offerings" had not been uncommon in former reigns. Under Richard III, in 1484, an act of Parliament abolished benevolences as "new and unlawful inventions"; but, despite this, they continued to be exacted by Richard himself and by Henry VII. In 1614 James I tried, but with little success, to raise money by this expedient. See FINANCE, Vol. IX, p. 177. See also CONVOCATION, Vol. VI, p. 327.

BENEZET, ANTHONY, philanthropist; born at St. Quentin, France, Jan. 31, 1713, died at Philadelphia, Pennsylvania, May 3, 1784. He joined the Society of Friends and emigrated to Philadelphia, where he devoted his attention to the abolition of the slave trade, to the education of the colored race, and the alleviation of the condition of prisoners. He published a few works, which are of a religious or historical nature, among them *Some Historical Account of Guinea, with an Inquiry into the Slave Trade.*

BENFEY, THEODOR, an Orientalist and comparative philologist of modern times. For an extended account of his career, see PHILOLOGY, Vol. XVIII, p. 781.

BENGAL, BAY OF, a portion of the Indian Ocean, into which flow the Ganges and the Bramahputra on the north, the Irrawaddy on the east, and the Mahanuddy, the Godavery, the Kistna or Krishna and the Cavery on the west. The northern shore, measuring 250 miles, reaches from Balasore to Chittagong, and at the south the bay extends for 1,200 miles between Coromandel and Malacca. It is noted for its high tides, which rise to an altitude of seventy feet.

BENGAL LANGUAGE, one of the seven great Aryan vernaculars of India, spoken mainly in the basin of the Lower Ganges. The great mass of its words are of Sanskrit origin. In its present form it is modern, no literature in it being known to exist earlier than the sixteenth century, and even then it was not differentiated from Sanskrit nearly to the same extent as at present. Among the languages spoken in northern and central Hindustan, Bengali ranks next to Hindi, the most important. It is the language of about twenty millions of the seventy and odd millions who inhabit the Bengal basin.

BENGAL LIGHT OR BLUE LIGHT, a brilliant light used at sea for signaling, and in ordinary pyrotechny; q.v., Vol. XX, p. 136. It is prepared from niter, sulphur, and the tersulphuret of antimony, mixed in the following proportions by weight: Niter 6, sulphur 2, tersulphuret of antimony 1. When ignited it bursts into rapid and vivid combustion, evolving a brilliant, penetrating, but mellow light. As the fumes evolved are poisonous, the light cannot be used in safety in inclosed spaces.

BENHAM, HENRY W., military engineer; born in Cheshire, Connecticut, in 1816; died in New York City, June 1, 1884. He was graduated at West Point in 1837; assigned to the engineering corps, and served in various places until the Mexican War; served through that war with distinction; was promoted to the rank of captain in 1848. From 1848 to 1853 he was in charge of various government works at New York, Boston and elsewhere; went into active service in 1861; was in command of the northern district of the department of the South; was brevetted colonel, brigadier-general, and later appointed major-general of volunteers. Attained the full rank of lieutenant-colonel of engineers in the United States army; from 1868 to 1877 was stationed on the coast of New England; was placed on the retired list in 1882. He devised valuable plans for the laying of pontoon bridges and invented the picket shovel.

BENI, the name of a large river and also of a department of Bolivia. See BOLIVIA, Vol. IV, pp. 10, 11.

BENICIA, a city in Solano County, central California, former capital of California, situated on the north side of Carquinez Strait, at the head of navigation for large sea-going vessels, about midway in a direct line between San Francisco and Sacramento. One of the principal objects of interest is the old capitol, a fine brick edifice overlooking the waterfront from a commanding eminence. Benicia barracks and the United States arsenal for the Pacific Coast are located here. Among the principal manufactures are flour, leather and hydraulic cement, large quantities of superior limestone being quarried in the vicinity. Benicia is the seat of St. Augustine College, and of a law school, a number of young ladies' seminaries, and a Dominican monastery. Population 1890, 2,361.

BENI-HASSAN, a village of Upper Egypt, on the east bank of the Nile, 23 miles S.E. of Minieh. The place is remarkable for the numerous grottoes in its vicinity, which are among the most interesting in Egypt. See ARCHITECTURE, Vol. II, pp. 388–391.

BENI-ISGUEN, a town in the Sahara, on Wadai Mzab, Algeria, in lat. 33° 30′ N., long. 2° E.; surrounded by a rampart flanked with towers. It has some trade in grain. Population 1891, 5,500.

BENI-ISRAEL (SONS OF ISRAEL), a remarkable race in the west of India, who preserve a tradition of Jewish descent. See JEWS, Vol. XIII, p, 685.

BENI-KHAIBIR, KHEYBAR OR KHYBAR, a small tribe living in a few encampments on the northwest of the Hejaz, in Arabia, supposed to be of Jewish origin and thought by some to be descendants of the Rechabites.

BENI-SOUEFF, a town, capital of the moudirien or province of the same name, central Egypt; situated on the left bank of the Nile, about 65 miles above Cairo, with which it is connected by railroad. It is a pretty and well-built town; contains a number of cotton-mills and alabaster-quarries, and is the entrepôt for the produce of the rich valley of Fayoom. Population 1891, about 7,000.

BÉNITIER OR BENATURA, the name of the vase or vessel in which "holy water" is held in Roman Catholic churches. Bénitiers are either movable or fixed. Portable ones, commonly of silver, are used in processions. The bénitiers belonging to the church of St. Sulspice in Paris are remarkable for their great beauty. They are formed

of magnificent shells and bordered with gilt copper. The fixed bénitiers are generally placed near the doors of the church, so that the people may dip their fingers in the water and cross themselves as they enter or leave the church.

BENJAMIN, JUDAH PHILIP, lawyer, born in St. Croix, West Indies, Aug. 11, 1811; died in Paris, France, May 8, 1884. He was of Jewish parentage; removed with his family to Savannah, Georgia; studied at Yale; read law in New Orleans; was admitted to the bar in 1834, and became a member of the firm of Slidell, Benjamin and Conrad. In 1845 he was a member of the convention to revise the state constitution. In 1852 he was elected to the United States Senate as a Whig, but during the antislavery agitation became a Democrat, and was re-elected to the Senate in 1857, but withdrew with John Slidell at the secession of Louisiana. During his term he advocated the Kansas-Nebraska bill of 1854, but afterward insisted that the principle of popular sovereignty had been definitely set aside by the decision in the Dred Scott Case, which he wished accepted as conclusive. In February, 1861, he was appointed Attorney-General of the provisional government of the Confederate States, but resigned this office, and was appointed Secretary of State by Jefferson Davis, which office he held until the Confederacy was broken. He was called "the brains of the Confederacy." He fled from Richmond to the Bahamas, and thence to Liverpool, in September, 1865. He studied English law, entering Lincoln's Inn in 1866, and was called to the bar in the following summer. He was promoted queen's counsel in June, 1872, and acquired an extensive practice.

BENJAMIN, PARK, poet and journalist; born at Demerara, British Guiana, Aug. 13, 1809; died at New York City Sept. 12, 1864. His father was a native of Connecticut, but carried on business in Demerara. The son was very lame, and at an early age was sent to New England for education and medical treatment. He studied at Harvard and Trinity; was admitted to the bar in 1832, but his inclinations were in favor of literature. He went to New York and was associate editor on the *American Monthly Magazine*, and afterwards was with Horace Greeley on the *New Yorker*. He was on the staff of several other publications, most of which were unsuccessful. He was a contributor to various periodicals and the author of the poems *The Meditation of Nature; Poetry; A Satire; Infatuation; The Nautilus; To One Beloved; The Departed;* and *The Old Sexton.*



PARK BENJAMIN.

BENJAMIN, SAMUEL GREENE WHEELER, author; born in Argos, Greece, Feb. 12, 1837; graduated from Williams College in 1859; assistant librarian of the New York State Library from 1861 to 1864; United States minister to Persia from 1883 to 1885. He has published many books, among them *Constantinople, Isle of Pearls, and other Poems; What is Art? Art in America; Troy: Its Legend, Literature and Topography;* and *Persia and the Persians.* He also acquired a considerable reputation as an artist. Among his paintings are *Porta da Cruz, Madeira; The Wide, Wide Sea;* and *In the Roaring Forties.*

BENJAMIN-CONSTANT. See CONSTANT, BENJAMIN, in these Supplements.

BENKELMAN, a village, the capital of Dundy County, southwest Nebraska, on the Republican River, 41 miles W. of Culbertson, and on the Burlington and Missouri River railroad; has good public schools and several churches. Population 1890, 357.

BEN LAWERS, a mountain in Perthshire, Scotland, about 32 miles from Perth, on the west side of Loch Tay. This mountain is easy of ascent, and rich in specimens of alpine plants. A magnificent view is commanded from its summit, which has an elevation of 3,945 feet. Ore of titanium is found in the mountain.

BEN LEDI, a mountain of Perthshire, 4 miles from Callander, with an elevation of 2,863 feet. It received its name from the Druids, who are supposed to have had a place of worship on its summit. This mountain is celebrated in Scott's *Lady of the Lake.* See SCOTLAND, Vol. XXI, p. 522.

BENLOEW, LOUIS, philologist; born in Erfurt, Germany, Nov. 15, 1818; studied at Berlin, Leipsic and Göttingen; went to France in 1841 and was professor of languages at Nantes and Bourges; librarian at the Sorbonne; received his doctor's degree there in 1847; was chosen professor of ancient literature at Dijon in 1849; retired in 1882; is an officer of the Legion of Honor. Among his works are: *Aperçu Général de la Science Comparative des Langues; les Sémites à Ilion on la Vérité sur la Guerre de Troie;* and *La Grèce avant les Grecs.*

BEN LOMOND, a lofty mountain in the northwest of Stirlingshire, Scotland, on the east side of Loch Lomond. This mountain, forming the southern extremity of the Grampians, or central Scottish Highlands, is 3,192 feet high, and consists of mica and slate, with veins of quartz, greenstone, feldspar and porphyry. The summit is steep on the north, with a gentle declivity on the southeast. It is covered with vegetation to the top. Though considerably surpassed in height by several other Scottish mountains, none are more imposing. Seen from Loch Lomond, it appears a truncated cone, and between Stirling and Aberfoyle a regular pyramid. It has been ascended by a greater number of tourists than any other of the Highland mountains. The magnificent view from the top in clear weather includes the whole length of Loch Lomond, which is 30 miles. The north semicircle of the horizon is bounded by Bens Lawers, Voirlich, Ledi, Cruachan and Nevis, while some of the beautiful Perthshire lochs are seen.

BEN MACDHUI, a mountain of Aberdeenshire, 18 miles N.W. of Castletown-of-Braemar; belongs to the Grampian range, the second highest mountain in Britain. It has an elevation of about 4,296 feet.

BENNETT, CHARLES WESLEY, Methodist clergyman; born in East Bethany, New York, July 18,

1828; died at Evanston, Illinois, April 17, 1891. He was graduated at Wesleyan University in 1852; taught in public schools from 1852 to 1862; entered the ministry in 1862; studied in Berlin in 1866–69; professor of history and logic in Syracuse University in 1871–85; professor of historical theology in Garrett Biblical Institute from 1885 until his death. He traveled extensively and embodied the results of his investigations abroad in *Christian Art and Archæology of the First Six Centuries*, and *National Education in Italy, France, Germany, England and Wales.*

BENNETT, EDMUND HATCH, jurist; born in Manchester, Vermont, April 6, 1824; was graduated at the University of Vermont in 1843; studied law, and was admitted to the bar in 1847; moved to Taunton, Massachusetts, in 1848; lecturer in the Harvard Law School in 1870–72; since 1876 has been with the Boston University Law School, first as professor and then as dean; has edited *English Law and Equity Reports; Bingham on Infancy;* Judge Story's works through seven editions; *Benjamin on Sales; Leading Cases in Criminal Law; Fire Insurance Cases;* etc.

BENNETT, JAMES GORDON, JR., born in New York City, May 10, 1841. He is the only son of the founder of the *Herald*, and became proprietor of that paper on the death of his father. He is very fond of yachting, and has taken part in two famous races with English yachts. His *Henrietta* won in 1866, but his *Dauntless* was beaten in 1870 by the English *Cambria*. He became managing editor of the *Herald* in 1866, and largely controlled it for the six years prior to his father's death. He gained prominence and advanced the interests of his paper by publishing in England storm-warnings from the United States Signal Service; by fitting out the *Jeannette* for a polar expedition; and by sending Henry M. Stanley to search for Livingstone. Mr. Bennett resides most of the time in Paris, where he attends to the foreign news department of his paper. In 1883 he and John W. Mackay formed the Commercial Cable Company for transatlantic service. He founded the *Evening Telegram* in New York City and started an English edition of the *Herald* in 1888 in London but continued it only one year. The Paris edition is still published.



JAMES GORDON BENNETT.

BENNETT, JOSEPH, music critic and journalist; born in Berkeley, Gloucestershire, England, Nov. 29, 1831; went to London, and from 1855 to 1870 wrote for the *Sunday Times* and the *Musical Standard;* since 1870 he has been employed by the *Daily Telegraph;* published a series of sketches of composers in the *Musical Times*, which have since been issued in book form as *Primers of Musical Biography;* made a tour of the United States in 1885; has written the librettos for a number of oratorios, among them Mackenzie's *Rose of Sharon* and Sullivan's *Golden Legend.*

BENNETTSVILLE, a town, the capital of Marlboro County, northeast South Carolina, on the Atlantic Coast line and Cape Fear and Yadkin Valley railroads; has graded schools, churches and cotton-seed-oil mill. Population, 978.

BEN NEVIS, a lofty mountain in the county of Inverness, Scotland. It has a height of 4,406 feet; is exceedingly difficult of ascent, with a precipice of 1,500 feet in depth on the northeast side, where snow remains throughout the year. It is the loftiest summit in Great Britain; in 1883 a meteorological observatory was erected on the summit; a carriage-road runs the entire height. Granite and gneiss form the base of the mountain, which, in its upper part, is composed of porphyry.

BENNIGSEN OR BENNINGSEN, LEVIN AUGUST THEOPHILUS, COUNT, a Russian general; born at Brunswick in 1745; died in Hanover, Oct. 3, 1826. He joined the Russian army in 1773, and in the Turkish war soon attracted the notice of the Empress Catherine, who employed him to carry out her designs against Poland. He was one of the leaders of the conspiracy against the Emperor Paul. He fought with success in the battle of Pultusk in 1806, and held the chief command in the obstinate and murderous struggle at Eylau in 1807. When Napoleon invaded Russia in 1812, Benningsen commanded the Russian center on the bloody field of Borodino, and gave orders for fighting a second battle before the walls of Moscow. Before the French began their retreat he gained a brilliant victory over Murat at Woronowa. In 1813 he fought victoriously in the battle of Leipsic, and was created count by the Emperor Alexander on the field. He retired to his estate in Hanover in 1818.

BENNINGTON, a town, the capitol of Bennington County, in southwestern Vermont, on the Bennington and Rutland and Fitchburg railroads, 35 miles N.E. of Albany, New York; the largest manufacturing center in the state. Noted for the battle of Bennington, Aug. 16, 1777, where General Stark, at the head of the "Green Mountain Boys," defeated a detachment of Burgoyne's army. A battle monument 302 feet high was erected and dedicated in 1891. Bennington, North Bennington and Bennington Center are the three villages of the town of Bennington. A soldiers' home and excellent schools are at Bennington. Some of the articles manufactured here are iron, woolen goods, pottery, chairs and lumber. Population 1890, 3,971.

BENOIT, PIERRE LEOPOLD LEONARD, Belgian composer; born in Harelbeke, West Flanders, Belgium, Aug. 17, 1834; studied under Fétis at the Brussels Conservatory; since 1867 has been director of the Antwerp School of Music; wrote his first opera in 1857; has written many cantatas and oratorios, of which the stronger are *Drama Christi; Lucifer;* and *La Guerre.*

BENOÎT DE SAINTE-MORE, a French poet of the twelfth century. His early history is obscure. He was probably a Norman by birth. He became a troubadour, and was patronized by Henry II of England. His celebrated works were written between 1180 and 1185. For an account of his writings, see ROMANCE, Vol. XX, p. 638.

BENOUVILLE, JEAN ACHILLE, French landscape-painter; born in Paris, July 15, 1815; died there, Feb. 6, 1891; studied under Picot; in 1863 received a first-class medal and the decoration of the Legion of Honor. His Campagna scenes are the best known of his works.

BEN-RHYDDING, a hydropathic establishment in the West Riding of Yorkshire, England, on the river Wharfe, 16 miles from Leeds. A large sanatorium is maintained there.

BENSELER, GUSTAV EDUARD, scholar in Greek; born in Freiberg, Saxony, Feb. 26, 1806; died in Leipsic, Feb. 1, 1868; the author of *Hiatus in the Attic Orators.* See ISOCRATES, Vol. XIII, p. 393.

BENSHIE. See BANSHEE, in these Supplements.

BENSON, EDWARD WHITE, archbishop of Canterbury, was born near Birmingham, July 14, 1829, and died, Oct. 11, 1896, at Hawarden, in Wales. He was educated at King Edward's School, Birmingham, and at Trinity College, Cambridge, of which he was successively scholar and fellow, and where he graduated B.A. in 1852, as a first-class in classical honors and senior chancellor's medalist. He was for some years one of the masters in Rugby School, and held the head-mastership of Wellington College from 1858 to 1872. For several years he was examining-chaplain to the late Bishop of Lincoln, by whom he was appointed chancellor and canon residentiary of Lincoln, having been a prebendary of the same cathedral for three years previous. In December, 1876, he was nominated by the crown, on the recommendation of the Earl of Beaconsfield, to the newly restored bishopric of Truro, and was consecrated in St. Paul's Cathedral, April 25, 1877. In December, 1882, he was appointed by the crown, on Mr. Gladstone's recommendation, to the archbishopric of Canterbury, in succession to Dr. Tait. Dr. Benson has published several religious books, among which are *The Seven Gifts; Christ and His Times; Boy-Life at Wellington College;* etc.—His son, EDWARD F. BENSON, is chiefly famous for his novel *Dodo*, a graphic description of a heartless, flippant, *fin-de-siècle* woman of fashion. He also wrote *The Rubicon*, and has interested himself in archæological explorations in Greece.



ARCHBISHOP BENSON.

BENSON, EGBERT, jurist; born in New York City, June 21, 1746; died in Jamaica, Long Island, Aug. 24, 1833. He was graduated at Columbia College in 1765; became attorney-general of his state in 1777; a member of the "committee of safety," of the first legislature, and of the Continental Congress from 1784 to 1788; was judge of the supreme court of New York from 1794 to 1802; member of Congress from 1789 to 1793 and from 1813 to 1815. He published two books, *A Vindication of the Captors of André* and a *Memoir on Dutch Names.*

BENSON, HENRY C., Methodist Episcopal clergyman and writer; born near Xenia, Ohio, in 1815; entered the ministry in 1842; was elected professor of Greek in Asbury University, Indiana, in 1850, but resigned in 1852 to go to California, where he became editor of the *Pacific Christian Advocate* in 1864, and the *California Advocate* in 1868; did missionary work among the Choctaw Indians; wrote *Life Among the Choctaw Indians* and a *Sketch of the Southwest.*

BENSON, JOSEPH, Methodist clergyman; born in Cumberland, England, Jan. 25, 1748, and died in London, Feb. 16, 1821. He studied theology, intending to enter the ministry of the Church of England, but, attracted by Wesley, he entered the Methodist ministry instead. He became president of the conference, succeeding Wesley; was editor of the *Wesleyan Magazine;* wrote, among other books, *A Defence of the Methodists;* an *Apology for the Methodists*, and a *Commentary on the Scriptures* (5 vols., 1818.)

BENSON, a village, the capital of Swift County, northwest Minnesota, on the Great Northern railroad, 134 miles N.W. of St. Paul; has excellent schools, several churches, flouring-mills and small manufactures. Population 1895, 1,121.

BENT-GRASS (*Agrostis*), a large genus of grasses, widely distributed through temperate and cold climates. All are of slender and delicate appearance; some are very useful as pasture grasses and for hay, on account of their adaptation to certain kinds of soil. The common bent-grass, or "redtop" (*Agrostis vulgaris*), abounds in dry, elevated pastures. *A. canina* is also very common. *A. dispar*, the American herd's-grass, is cultivated in France. The name *bent* is applied to any stiff or wiry grass which grows on neglected ground, but in America is exclusively applied to *Agrostis vulgaris* and *A. canina.*

BENTHAM, GEORGE, an English botanist; born Sept. 22, 1800, at Stoke, a village since absorbed in Portsmouth; died in London, Sept. 10, 1884. The son of an officer who had risen to high rank in the Russian and the English service, young Bentham's earlier years were spent largely abroad, but from 1826 to 1832 he lived in London with his uncle, the jurist, and studied law, In 1827 he published *Outlines of a New System of Logic*, in which is set forth for the first time the doctrine of the quantification of the predicate. He was called to the bar, but soon abandoned the law for botany. He catalogued the plants of the Pyrenees (1824–26), and was elected in 1828 a fellow of the Linnæan Society, and in 1829 secretary of the Horticultural Society. From this time he devoted himself entirely to his new study, and soon published his important *Libriatarum Genera et Species* (1832–36). In 1854 he presented his collections to the royal gardens at Kew, where he prosecuted his studies during the remainder of his life. *Genera Plantarum* (3 vols., 1862–83), in the completion of which he was assisted by Sir Joseph Hooker, is exhaustive and valuable, and may be said to summarize our present knowledge of botany. He was president of the Linnæan Society from 1863 to 1874,

and member of many other British and foreign learned bodies.

BENTHAMIA, a genus of plants of the family *Cornaceæ*, consisting of Asiatic trees or shrubs, of which the fruit is formed of many small drupes grown together. *B. frugifera*, a native of Nepaul, is a small tree, with lanceolate leaves, and a reddish fruit very much like a mulberry, only somewhat larger, and quite pleasant to the taste. The flowers are fragrant.

BENTLEY, ROBERT, medical botanist; born in Hitchin, Hertfordshire, England, March 25, 1821; became a member of the Royal College of Surgeons in 1847; professor of botany in King's College, London; was President of the Pharmaceutical Society of Great Britain in 1866–67; honorary member of the American Pharmaceutical Association; was for 10 years editor of the *Pharmaceutical Journal*. Among his writings are a *Manual of Botany; Student's Guide to Systematic Botany; Textbook of Organic Materia Medica;* and *Physiological Botany*.

BENTON, a village, the capital of Saline County, central Arkansas; on the St. Louis, Iron Mountain and Southern railroad, 23 miles S.W. of Little Rock. Has an academy and a pottery. Population 1890, 647.

BENTON, a village, the county seat of Franklin County, southwest Illinois, situated on the Chicago, Paducah and Memphis and on the St. Louis, Alton and Terre Haute railroads, 77 miles N.E. of Cairo and 90 miles S.E. of St. Louis, Missouri. It has churches, a high school, a bank, a jail and several manufactories. Population 1890, 939.

BENTON, a village, the capital of Marshall County, southwest Kentucky, on the Paducah, Tennessee and Alabama railroad, 22 miles S.E of Paducah. Has an academy. Population 1890, 344.

BENTON, a village, the capital of Polk County, southeast Tennessee, 40 miles N.E. of Chattanooga; has a courthouse and an academy. Population 1890, 165.

BENTON, JAMES GILCHRIST, soldier and inventor; born at Lebanon, New Hampshire, Sept. 15, 1820; died at Springfield, Massachusetts, Aug. 23, 1881. He was a graduate of the Military Academy in 1842. He assisted in the preparation of the *System of Artillery for the Land Service*, and the *Ordnance Manual* in 1847. He served the following year at Harper's Ferry armory, and afterwards in the San Antonio ordnance depot. From 1849 to 1861 he was assistant inspector of arsenals, engaged in making experiments which led to the adoption of the Springfield rifle, and an instructor of ordnance and gunnery at the Military Academy. For most of the time during the Civil War he was commander of the Washington arsenal. Twice he performed acts of great bravery in extinguishing fire which had begun to burn in the arsenal and in a magazine; for his hardihood he was made lieutenant-colonel and colonel. He invented several military appliances, among them the Benton electro-ballistic pendulum, but never took out a patent, as he believed the government, which had educated him, was entitled to his services. He published *A Course of Instruction in Ordnance and Gunnery, for the Use of the Cadets of the United States Military Academy*.

BENTON, THOMAS HART, born near Hillsboro, Orange County, North Carolina, March 14, 1782; died at Washington, District of Columbia, April 10, 1858. He was only eight years old when his father died, and his educational advantages were extremely scant. Having removed to Tennessee he qualified himself for the practice of law and became a member of the Nashville bar in 1810. He held the rank of colonel under General Andrew Jackson during the War of 1812, and then began an acquaintance which was destined to bring them both into national prominence in after years. His career in Tennessee had been marked by acrimonious disputes and quarrels growing out of political differences, and he accordingly found it expedient to seek a wider field and more congenial surroundings in Missouri, then seeking admission to the Union. He took up his abode in St. Louis in 1815 and, entering politics, exhibited such signal abilities as to secure his election in 1820 to the United States Senate from the newly admitted State. He was reëlected in 1826 and served thirty years in all in this body. When Jackson, in his first annual address, proposed the removal of the public funds from the national bank to the state banks, Benton firmly supported the president's financial measures, and eloquently advocated the adoption of gold and silver as a currency basis. The subtreasury system now in use is a development of his views. His persistent advocacy of his favorite measures procured for him the nickname "Old Bullion," and caused the one-dollar gold coin to be for a long time jocosely called Benton's "mint-drop." He secured the enactment of laws opening up to settlement the unoccupied western lands, and successfully advocated surveys and explorations of the vast domain to the westward, foreseeing that it would be some day incorporated in the Union. He counseled a friendly policy towards the Indians, favored the building of a railroad to the Pacific coast and fostered beneficial public measures of all kinds. He refused to support President Polk's proposal of 54° 40′ N. Lat. as the Oregon boundary line, and he was largely instrumental in securing the adoption of the existing boundary. He was the author of the resolutions to expunge from the records the Senate's censure of President Jackson. When the slavery question came up with regard to the newly acquired Mexican states, there commenced a bitter hostility between Benton and Calhoun, which was intensified by the "nullification" measures. Through the influence of his enemies Colonel Benton lost party favor, and in a



THOMAS H. BENTON.

contest for Senatorship, and subsequently for the office of governor, he was defeated (1856). The last years of his life were devoted to literary work. *Thirty Years' View* is descriptive of the time in which he represented his state in the United States Senate. He wrote *An Abridgment of the Debates of Congress* and *An Examination of the Dred Scott Case.*

BENTON HARBOR, a city in Berrien County, southern Michigan, on Lake Michigan, at the mouth of the St. Joseph River, 60 miles N.E. of Chicago, on the Chicago and Western Michigan and on the Cleveland, Cincinnati, Chicago and St. Louis railroads; is a stopping-point for several lines of lake steamers; has a normal college and collegiate institute; is the commercial center of an extensive fruit-growing industry, and contains important manufactories of fruit-baskets, canned fruit, furniture, lumber and flour. Population 1895, 5,314.

BENTONVILLE, a town, the capital of Benton County, northwest Arkansas, on a branch of the St. Louis and San Francisco railroad, 27 miles N.W. of Fayetteville. It is in the midst of a fruit-raising district and has several fruit-evaporators; quantities of tobacco are shipped. Population 1890, 1,677.

BENTONVILLE, a village of Johnston County, central North Carolina, 20 miles W. of Goldsboro; famous for a battle between the armies of General Sherman and General Johnston, March 21, 1865. This battle was fought immediately after the battle of Averysboro. General Johnston advanced from Smithfield and attacked the left wing of Sherman's army, commanded by General Slocum; Slocum repelled the attack, and held his ground until reinforced by Sherman; the arrival of the right wing enabled Sherman to so shut in Johnston as to oblige him to retreat. The fighting during the first part of the battle was severe. The Union loss was 1,600 killed and wounded; the Confederate, 2,680 killed, wounded and missing. Population 1890, 46.

BENTURONG OR BINTURONG, a genus of carnivorous mammalia, intermediate in position between the civets and raccoons, and inhabiting India and the Eastern Archipelago. They are nocturnal animals, and possess long, hairy prehensile tails. No species are known.

BENTZON, THEO., the pseudonym of MARIE THÉRÈSE BLANC; q.v., in these Supplements.

BENUÉ OR BINUÉ, an important river of Central Africa at one time; erroneously called Tchadda, because of a supposed connection with the great lake of the Soudan. Dr. Barth regards it as the best means by which to communicate with the interior.

BENUÉ, an important river of central Africa. It enters the Quorra or Niger from the east, about 230 miles above the mouth of the river in the Gulf of Guinea. See NIGER, Vol. XVII, p. 497.

BENWOOD, a town in Marshall County, northeast West Virginia, on the Ohio River, opposite Bellaire, 4 miles S. of Wheeling, on the Moundsville, Benwood and Wheeling, the Ohio River, the Pittsburg, Cincinnati, Chicago and St. Louis, and the Wheeling Bridge and Terminal railroads; has steel-works, rolling-mills and blast furnaces. Population 1890, 2,934.

BENYOWSKY, MAURICE AUGUSTUS DE, COUNT, a Hungarian adventurer; born in Werbo, Hungary, in 1741; died in battle, in Madagascar, May 28, 1786. He was a man of remarkable character and extraordinary fortunes. He took part in the Seven Years' War, and in 1767 joined the Polish confederation, taking a prominent part in the campaign against the Russians until May, 1769, when he was captured; about seven months later, after being confined in several Russian prisons, he was banished, first to Siberia, and then to Kamchatka. He escaped from the latter place to France in May, 1771, and shortly after, by proposal of the French government, he established a colony at Madagascar, himself arriving on the island in February, 1774. He was proclaimed king by the chiefs in conclave in 1776, and adopted the costume of the natives, but he fell into contention with the French government of the Isle of France, and was at last slain.

BENZENE. See TAR, Vol. XXIII, pp. 59, et seq. Benzene is extensively employed in the arts as a solvent for fats, gums and resins, and as the basis for the manufacture of aniline and the aniline colors. It is also the source of many medicinal compounds, especially of salicylic and benzoic acids.

BENZERTA OR BIZERTA, LAKES OF, the ancient Hipponitis Palus and Sisaræ Palus, two lakes within the dominions of Tunis, North Africa, and about 30 miles from the coast. They are each about 10 miles long, and the larger one, which is clear and salt, is 6 miles broad; the smaller, which is turbid and fresh, is 3 miles broad. They are two miles apart, but united by a channel. Tunis is supplied with fish mainly from these lakes. See BIZERTA, Vol. III, p. 794.

BENZIDINE DYES, secondary dyes which take upon cotton without the use of a mordant. See AZO-COLORS, in these Supplements; also TAR, Vol. XXIII, p. 59.

BENZIL OR BENZOYL, the radical or root of the group of substances which comprehends as members the hydrid of benzoyl, benzoic acid, benzoin and benzol. It is prepared by passing a stream of chlorin gas through fused benzoin, or by heating one part of benzoin with two parts of concentrated nitric acid. Benzil floats to the upper part of the liquid mixture as a liquid oil, which solidifies on cooling. It is a tasteless solid, insoluble in water, but readily dissolved by ether and alcohol. It was discovered and named by Wöhler and Liebig in 1832.

BENZONIA, a village, the capital of Benzie County, northwest Michigan, 6 miles E. of Lake Michigan, 30 miles S.W. of Traverse City. The Benzonia Congregational College is located here. Population 1890, 369.

BENZONIA COLLEGE, an educational institution at Benzonia, Michigan, under the auspices of the Congregational Church; organized in 1891, in 1895 had 10 instructors, 125 students and a library of 2,500 volumes; president, Rev. M. A. Breed.

BENZOIN ODORIFERUM, a genus of plants belonging to the family *Lauraceæ*, known as *Lindera Benzoin*, found in North America and Nepaul, India. The berries of this shrub yield an aromatic

stimulant oil. They are sometimes used as a substitute for allspice.

BEOWULF, an Anglo-Saxon epic poem, one of the greatest literary curiosities and most remarkable historical monuments in existence. The only known copy is in the British Museum. See ENGLISH LITERATURE, Vol. VIII, pp. 403, 404.

BEQUEATH, to leave personal property by will or testament to another. In the case of real estate the correct term is "devise." Neither of these words is essential to the validity of a will, although it is usual and safe so to use them; other words, showing clearly the intention of the testator, will suffice.

BERAT, a town of Albania, European Turkey, in the pashalic of Avlona, situated on the banks of the Ergent, about 30 miles N.E. of the seaport of the same name. The valley in which Berat stands is very fertile, producing large quantities of grain, oil and wine. The population is about 12,000, two thirds of whom are Greek, the remainder Turks. It has a citadel, and traces of ancient Greek buildings.

BERAUD, JEAN, French artist; born in St. Petersburg, Russia, Dec. 31, 1849; at first a student of sculpture, but having more taste for painting, went to Paris to study that art; did military service at the siege of Paris in 1870, was afterward a student under Bonnat. His first recorded work was finished in 1874. He has attracted attention by his portrayal of scenes in the life of Christ, with all the personages dressed in modern fashion, and the natural environment changed to some place in Paris. Among these his *La Madeleine* and *Le Retour de l'Enterrement* are the best known.

BERBERIDACEÆ, a family of exogenous plants, of which the different species of barberry are the best known examples. Many of the plants are spiny shrubs. (For an account of the typical and largest genus, *Berberis*, see BARBERRY, in these Supplements.) The most common North American representatives of the family are the "blue cohosh" (*Caulophyllum*), the "mandrake," or "May-apple" (*Podophyllum*) and the "twin-leaf" (*Jeffersonia*). Berberine is an alkaloid found in the barberry, and widely distributed among other plants.

BERCHTA, the name given, in the south of Germany and Switzerland, to a mythological being who was apparently the same as Hulda in northern Germany. The being represented, originally, one of the kindly and benign aspects of the unseen powers, but in the course of time she became rather an object of terror; the difference probably arising from the circumstance that the influence of Christianity was felt, and the pagan deities were converted into demons. Lady Berchta was supposed to have the oversight of spinners. The last day of the year was sacred to her, and any flax left on the distaff that day she spoiled. Her festival was kept with a kind of meager fare—oatmeal gruel and fish. In some places she was represented as having a long iron nose and an immensely large foot. That she was once an object of worship is shown by the numerous springs, etc., that bear her name in Salzburg and elsewhere. Many of the Sagas of Berchta were transferred to the famous Berthas of history and fable. The numerous stories of the "White Lady" have doubtless their root in the ancient Berchta.

BERCKMANS, PROSPER JULES ALPHONSE, horticulturist; born in Aerschot, Belgium, Oct. 13, 1830; moved to the United States in 1850; since 1850 has lived in Georgia. His father was the author of *Album de Pomologie*. He himself has been president of the American Pomological Society. He was a commissioner at the New Orleans exposition of 1884.

BERCK-SUR-MER, a harbor and bathing-resort, department of Pas-de-Calais, North France; on the Pas-de-Calais, 22 miles S. of Boulogne. Some ship-building and sail-making is carried on. Population in 1890, 3,293.

BERCY, a city in the department of the Seine, northwest France, situated on the right bank of the Seine. It forms a suburb of Paris, annexed in 1860; has a large business in wines and other liquors. Population, about 15,000.

BERE OR BIG BARLEY. See BIGG, in these Supplements.

BEREA, a village in Madison County, central Kentucky, about 100 miles S. of Cincinnati, on the Louisville and Nashville railroad; the seat of Berea College; has a lumber-mill. Population 1890, 650.

BEREA OR BERŒA, an ancient city of Macedonia, mentioned in Acts xvii, 10, 13. Now called Veria, or Kara Verria, which is situated on one of the lower ranges of Mount Bermius, on the Astræus, a tributary of the Haliacmon, S.W. of Pella; about 20 miles from the sea. Cotton-weaving, dyeing and fruit-raising are the chief industries. Population, about 8,000.

BEREA, a town in Cuyahoga County northeastern Ohio, 13 miles S.W. of Cleveland, on the Cleveland, Cincinnati, Chicago and St. Louis, the Cleveland, Lorain and Wheeling, and the Lake Shore and Michigan Southern railways. Baldwin University and German Wallace College (both under the care of the Methodist Church) are situated here. Large quantities of sandstone are quarried. Population, about 3,500.

BEREA COLLEGE, located at Berea, Kentucky; conducted under the auspices of the Methodist Episcopal Church; founded in 1858, by J. G. Fee and J. A. R. Rogers, for the education of colored people. During the war the college was closed, but reopened immediately afterward; endowment, $100,000; over 400 students attend.

BEREANS, a sect of Christians which originated in Scotland in the eighteenth century, but are now almost extinct. Their name is derived from the circumstance that the inhabitants of Berea "received the word with all readiness of mind, and searched the Scriptures daily" (Acts xvii, 11). They believe that the knowledge of God's existence and character is derived from the Bible alone, and not from reason or nature; that the Psalms of David do not relate to David at all, but exclusively to Christ; that assurance is of the essence of faith, and that unbelief is the unpardonable sin. Ordinarily, in their points of doctrine, they are Calvinistic. The founder of the Bereans was the Rev. John Barclay, a native of

Perthshire. From him they also received the name of Barclayans. See BARCLAY, JOHN, Vol. III, p. 369.

BEREGH, a town and county of northeast Hungary. The county is 1,440 square miles in extent, is quite mountainous, and the chief production is wine. It has a population of about 180,000. The chief towns are Bereghszasz, population, 7,000; and Munkacs, population, 9,000. The town of Beregh has a population of about 1,650.

BERENGAR I, king of Italy, the son of Eberhard, duke of Friuli and of Gisela, daughter of the Emperor Louis the Pious. He was assassinated in 924. For connecting history, see JOHN X, Vol, XIII, p. 710.

BERENGAR II, son of Adalbert, count of Ivrea, succeeded to his father's possessions in 925, and married Willa, niece of Hugo, king of Italy, in 934. By revolt he became king himself, but was deposed by Emperor Otho, and died in exile in 966. See ITALY, Vol. XIII, p. 469.

BERESFORD, CHARLES WILLIAM DE LA POER, LORD, British naval commander; born in Philiptown, Dublin County, Ireland, Feb. 10, 1846. He entered the royal navy in 1859. In 1863, while a midshipman on board the *Defence*, he twice saved life from drowning, and received the clasp of the Royal Humane Society. He accompanied the Prince of Wales to India as naval aide de-camp. He was appointed lieutenant in 1868; commander in 1875; commander of the royal yacht *Osborne* from 1878 to 1881. At the bombardment of Alexandria, in 1882, he commanded the *Condor*, and distinguished himself during the action by his bravery and naval skill. The *Condor* was largely instrumental in silencing the Marabout fort, and earned the honor of a special signal from the admiral, "Well done, *Condor!*" For these services Lord Charles was promoted to the rank of captain. He served under Lord Wolseley in the Sudan campaign for the relief of General Gordon, and was in command of the naval brigade in the expedition across the desert. He was elected to Parliament for Waterford in 1874, and for East Marylebone in 1885. He was appointed a lord of the admiralty in 1886, and in 1888 resigned his position as member of Parliament to qualify for admiral.

BERESFORD, WILLIAM CARR, VISCOUNT, an English military commander; born in Ireland, Oct. 2, 1768; died Jan. 8, 1854; entered the army in 1785; was conspicious in the reconquest of the Cape of Good Hope in 1806; was made a brigadier-general; served in the Argentine Republic in 1806; in 1809 was marshal of Portugal; was made a Knight of the Bath in acknowledgment of his aid at the battle of Busaco in 1810. The year following (1811) he was placed in command during the battle of Albuera, which he won, receiving for this the thanks of Parliament. He became baron in May, 1814, and in 1823 he was created viscount. He was master-general of ordnance under Wellington from 1828 to 1830.

BERESLAV OR BERISLAV, a city in the Russian government of Kherson, on the Dnieper, about 50 miles from its mouth. Population, 11,000.

BEREZOVSK, a village in the Asiatic Russian province of Perm, near Ekaterinburg, which gives name to a famous gold-field, worked since 1744. The mines are on the eastern slopes of the middle Ural chain, and the field is above five miles long. The washings on the Berezovka River are also very productive.

BERG, BURG OR BURGH, roots entering into composition of many names of places. *Berg* (in German) means "hill" and "mountain," and *burg* or *burgh* means "fort," "castle," "citadel" or other stronghold.

BERGA, a town of Catalonia, northeast Spain, 52 miles N.W. of Barcelona. The chief industry is the manufacture of cotton fabrics. It has paved streets, a hospital, several convents and a castle. Many vineyards and olive-groves give employment to the people. Population 1891, 4,859.

BERGAIGNE, ABEL, a French Orientalist; born in Vimy, France, Aug. 31, 1838; died in Paris, Aug. 20, 1888; was professor of Sanskrit at the Sorbonne; published his first work in 1872, a translation of the gnomic poem, *Le Bhâminivilâsa;* in 1883 he completed the third volume of *The Vedic Religion, after the Hymns of the Rig-Veda;* at the time of his death he was at work upon a lexicon for the *Rig-Veda.*

BERGAMOT, a name applied as follows: (1) The fruit of a species of *Citrus* (*C. medica*), thought by some to be merely a variety of the orange (*C. aurantium*), and cultivated in southern Europe. From the very aromatic rind the volatile oil of bergamot is obtained, known as the "essence of bergamot," and extensively used in perfumeries; also an ingredient of eau de Cologne and other essences; (2) the popular name of several species of *Labiatæ*, notably *Monarda fistulosa* and *M. didyma* in the United States, and *Mentha citrata* in England; (3) a variety of pear. The regular bergamot-pear is flattish, rough-skinned, with long stalk, a very juicy pulp, as soft as butter and of an extremely pleasant flavor.

BERGE, WILLIAM, organist; born in Witzenhausen, Hesse-Cassel, Germany, in 1824; died in New York, April 6, 1883. He played the organ in church before he was eight years old. He emigrated to New York City in 1846; became organist of the St. Francis Xavier Church, in Sixteenth Street; remained there until 1881; was during that time professor of music in the College of the Sacred Heart, and was founder and conductor of the Berge Choral Union.

BERGEDORF ("Hill Village"), a manor and borough of Germany, belonging to Hamburg since 1867. The people are well conditioned and industrious, and engaged in agriculture, cultivating fruit and vegetables for the London as well as the Hamburg market. Population, about 7,000. See HAMBURG, STATE OF, Vol. XI, p. 404.

BERGER, GEORGES, French civil engineer; born in Paris in 1834; he first studied mining-engineering, but soon turned his attention to the fine arts; spent several years traveling; was placed in charge of the foreign exhibits at the exposition of 1867; edited the *Journal des Débats*; succeeded M. Taine at the School of Fine Arts; was director of the foreign section at the exposition of 1878; took prominent parts in the exposition of 1881 and succeeding expositions; was director-general of the exposition of 1889; an officer of the Legion of Honor. While professor

at the School of Fine Arts he published *L'École Française de Peinture Depuis ses Origines Jusqu'à la fin du Règne de Louis XIV.* In 1889 he published *Exposition Universelle Internationale de 1889.*

BERGER, PHILIPPE, Orientalist; born at Beaucourt, France, Sept. 15, 1846; studied until 1873 at Strasburg, in the Protestant Theological School; assisted, in 1873, in the editing of *Corpus Inscriptionum Semiticarum.* He was chosen librarian at the Paris Institute in 1824, and given the chair of Hebrew in 1877. Among his writings are: *Les Ex-voto du Temple de Tarrit de Carthage; Nouvelles Inscriptions Nabatéennes;* and *L'Arabie avant Mahomet d'Après les Inscriptions.*

BERGER, SAMUEL, Lutheran preacher, brother of the preceding; born at Beaucourt, May 2, 1843; studied at Paris, Strasburg and Tübingen; became pastor at Augsburg in 1887; has been librarian of the Protestant Theological Faculty and in charge of the chair of archæology. Among his writings are *La Bible au XVI Siècle; Étude sur les Origines de la Critique Biblique;* and *La Bible Française au Moyen-âge.*

BERGERAC, SAVINIEN CYRANO, poet, novelist and dramatist; born in Périgord, France, about 1620; died in Paris, 1655, from a wound received in a duel. His greatest work was the burlesque romance, *Voyages à la Lune et au Soleil,* which is by some considered as the original of *Gulliver's Travels.* As a poet and dramatist he ranked second only to his contemporaries, Molière and Racine.

BERGERAT, AUGUST EMILE, French poet and art critic; born in Paris, April 29, 1845; when he was 20 years old a one-act comedy of his was given at the Comédie Française. He followed this by several very successful comedies in verse. During the siege of 1870 he wrote several patriotic poems—*Poèmes de la Guerre.* Among his later writings are *Mes Moulins; Figarismes de Caliban;* and *Théophile Gautier, Entretiens Souvenirs et Correspondance.*

BERGH, HENRY, philanthropist, was born in New York City in 1823; died there, March 12, 1888. He was of German descent. His father was a wealthy ship-builder. He and his brother succeeded to the ship-building business, but it was not to his taste, so he abandoned the business and entered Columbia College. Before completing the course he went to Europe, where he spent five years. In 1862 he was appointed secretary of legation at St. Petersburg. Ill health compelled him to resign two years later, and he went to London, where, among other famous people, he met the Earl of Harrowby, president of the Royal Society for the Prevention of Cruelty to Animals. Returning to New York in 1864, he set about organizing a society for the prevention of cruelty to animals. The following year the society was formed, with Mr. Bergh as president. The work done by this society has been a noble one. Mr. and Mrs. Bergh gave largely of their abundant means for the work. Through Mr. Bergh's influence similar societies have been formed in several cities, while 39 states have adopted laws for the protection of animals. In 1874 his attention was called to the inhumanity sometimes practiced upon children, and he founded the Society for the Prevention of Cruelty to Children. Mr. Bergh wrote plays, some poetry and a few sketches; but the work for which he will always be remembered is that in regard to kind treatment of children and animals. See also CRUELTY TO ANIMALS, in these Supplements.

BERGHAUS, HEINRICH, geographer; born in Cleves, Rhenish Prussia, May 3, 1797; died in Stettin, Feb. 17, 1884. He was educated at Münster; in 1816 became geographical engineer in the war department at Berlin; in 1824 professor of mathematics in the Berlin Architectural Academy; in 1836 director of the Potsdam Geographical School. He was one of the most active promoters of geographical knowledge. His *Physical Atlas* (90 plates; Gotha, 1838–48) is the most prominent of his cartographical works. He also edited several geographical periodicals, and published *Ethnography; Nations of the Globe;* and a translation of Catlin's *Indians of North America.*

BERGHAUS, HERMANN, a German cartographer of ability; born in Herford, Germany, Nov. 16, 1828; died at Gotha, Dec. 3, 1890. He was connected for more than forty years with the map-making and publishing house which bears his name in Gotha, Germany. For many years, and indeed to the date of his death, he was regarded as an authority in geographical matters. He was not a traveler, but a recluse, devoting a powerful genius and an indefatigable application to the researches of travelers and other geographers, ancient and modern. One of his earliest tasks was the collection of statistics with regard to the measurements of heights, and one of the monuments of his genius is his hypsometric and orographic map of central Europe, which he published in 1857, which marked an epoch in map-making. One of his works was his eight-sheet map of the world on Mercator's projection, which, appearing in 1863, has been sold all over the world, eleven editions having been issued under his direction. At the time of his death he was engaged upon the new edition of the *Berghaus Physical Atlas,* first produced by his great-uncle, Heinrich Berghaus, in 1852.

BERGK, THEODOR, German classical scholar; born in Leipsic, May 22, 1812; died in Ragatz, July 20, 1881. He was graduated at Rostock; became professor of classical literature at Marburg in 1842; at Freiburg in 1852, and Halle in 1857. He published *Anacreon* and *Poetae Lyricoei Graeci.*

BERGLER, JOSEPH, a historical painter; born at Salzburg in 1753; died in Prague in 1829. He was painter to Cardinal Auersperg at Passau in 1786, and was appointed director of the Academy of Prague in 1800. The impetus which he gave to the fine arts in Bohemia was very marked, and his school furnished a goodly number of eminent artists. His principal work is *Cyclus,* descriptive of the important events in Bohemian history.

BERGMANN, CARL, orchestra conductor; born in Ebersbach, Saxony, April 11, 1821; died in New York, Aug. 10, 1876. He came to New York in 1848, a fugitive for having participated in the rebellion in Saxony that year; from 1850 to 1852 was conductor of the Germania Society, and of the Philharmonic Society from 1861 to 1875; introduced

German opera at Niblo's Theater in 1856. He composed several concert pieces, a symphony and an opera, but is best known as a conductor.

BERGMANN, ERNST VON, surgeon; born in Riga, Dec. 16, 1836; studied in Berlin, Vienna and Dorpat; in the wars of 1866 and 1870 he served in the Baden and Prussian armies; from 1878 to 1882 was professor of surgery in the University of Würzburg; since 1882 has been professor of surgery at the University of Berlin. *Das Putride Gift, Ueber Fettembolie,* and *Das Pepsin* are among his best works.

BERGMANN, FREDERICK WILLIAM, a German linguist; born in Strasburg, Feb. 9, 1812; died there, Nov. 14, 1887. In connection with theology he studied philology, in his native city. He continued his linguistic studies in Göttingen, Berlin and Paris, and in 1838 he became professor of foreign literature in the University of Strasburg. He has written numerous important works on the Semitic and other languages.

BERGMEHL OR MOUNTAIN-FLOUR, a deposit of white or cream-colored powder of extreme fineness, composed almost entirely of the indestructible siliceous frustules, or cell-walls of *Diatomaceæ.* From its resemblance to flour it has been mixed with ordinary food and used by the inhabitants of Norway and Sweden, who supposed it to be nutritious, but it seems to derive its chief value from its increasing the bulk of the food, thereby rendering the really nutritious portion more satisfying. In Maryland and eastern Virginia an extensive bed of this organic matter occurs, nearly 100 miles long and 30 feet thick. Smaller deposits occur in North Wales, Ireland and Germany.

BERGSÖE, TÖRGEN WILHELM, a Danish writer; born in Copenhagen, Feb. 8, 1835. In early life he became noted as a zoölogist; but the use of the microscope induced temporary blindness, and he turned his attention to poetry, and afterwards to writing novels. His productions were very popular. *Fra Piazza del Popolo; Bruden fra Rorvig; Fra gamle Dage; Fra Sollyse Strande;* and *Rome under Pius IX,* are among his best writings.

BERGUES, a town in the department of the Nord, northeast France, five miles from Dunkirk, on the Colne. The canal of Bergues, which admits vessels of 300 tons burden, unites it with Dunkirk and the sea, and its favorable situation makes it the entrepôt of the produce of the adjoining country. It has a college, a hospital and a public library; also manufactories of soap, tobacco, earthenware, and sugar and salt refineries. Population 1891, 5,738.

BERGYLT, a name often applied to the rose-fish (*Sebastes marinus*) of the northern seas. Sometimes it is known as Norwegian haddock. The fish belongs to the same family as the sticklebacks. It is used for food by the inhabitants of Greenland and Shetland.

BERHAMPUR, the name of two towns in British India. 1. Berhampur in Madras is a military station in the district of Ganjam, 23 miles S.W. of the town of Ganjam, and but 9 from the coast. The climate is very healthful, and there is some trade in sugar and silk fabrics. Population, about 20,000. 2. Berhampur in Bengal, situated on the left bank of the Bhagirathi, 5 miles below Murshidabad. It was long one of the principal military stations in British India, and the barracks, now largely devoted to other uses, still form the most important feature of the town. It has also fine public buildings and a government college. In 1857 Berhampur was the scene of the first open act of mutiny. Population, about 27,000.

BERING OR BEHRING SEA QUESTION. (See BERING'S STRAIT, Vol. III, pp. 509, 510, and POLAR REGIONS, Vol. XIX, p. 318, for Bering Strait and Sea and Ivan I. Bering, the discoverer.) In 1870, after the transfer of Alaska from Russia to the United States, the Pribilof Islands, in Bering Sea, were leased by the United States government to the Alaska Commercial Company for 20 years, and this company also rented the Commander Islands from Russia. The company was allowed to take not more than 100,000 seals from the Pribilof Islands per annum, and the seals taken were to be exclusively young males, not breeding-males or any females. The company paid to the government $50,000 per annum as rent, and in addition a tax of $2 on each skin shipped from the islands. The value of fur-seal skins shipped from the territory and sold in the London market during the first 23 years of American occupation amounted to nearly $33,000,000. In 1890 a new lease of the islands under similar conditions was granted to the North American Fur-Sealing Company.

In the earlier part of the year vast herds of these seals, on their way to the breeding-grounds, pass the coast of Washington and British Columbia, and were there hunted at sea, in former times, by the Indians; but in recent years British and American schooners employed the Indians and killed the seals in vast numbers. These schooners, and likewise those of other European nations, pursued the seals into Bering Sea, killing indiscriminately half-grown pups and females upon which depended the future supply. The United States government asserted exclusive rights over the Bering Sea which gave rise to the diplomatic controversy now called the Bering Sea Question. The killing of the seals developed to such an extent that it became apparent that the careful regulation of the slaughter on the breeding-islands would not be sufficient to prevent the extermination of the species. In 1880 the total number of fur-seal skins taken by the pelagic hunting was 19,150, valued at $172,350, but the number had increased to 43,779 in 1890. In the summer of 1891 the British government and that of the United States agreed to submit to arbitration the dispute over the rival claims of the two countries, and to send a joint commission of experts to the seal islands to examine into the question, the killing of the seals both by British and American citizens being in the mean time prohibited until May, 1892, or "during the pendency of arbitration," with the exception of 7,500 per annum, to be killed by the American company. The claims presented before the arbitrators may be briefly summarized as follows: The United States claimed that Russia, prior to the cession of Alaska to the United States, exercised undisputed control over the Bering Sea which was not included in the phrase *Pacific Ocean,* as used

in the treaty of 1825 between Russia and Great Britain, in which Russia surrendered her right to control navigation, fishing and trading; that by the treaty of March 30, 1867, between Russia and the United States, the United States secured all the rights previously held by Russia, including property right in the seals and the right to protect them and prevent their extermination. The United States also contended that even should this right not be conceded, yet it was the international duty of Great Britain to concur in the adoption of regulations for preventing subjects of either power from capturing seals belonging to the Alaskan herd upon the high seas. Great Britain claimed that Bering Sea was an open sea; that non-use of the right of denial of Russia's claims did not abrogate that right; that vessels of all nations had always visited, explored and traded in the waters of Bering Sea; that when Russia sought, in 1821, to assume exclusive control over a large part of the Pacific Ocean (including Bering Sea) the United States, as well as Great Britain, had entered a vigorous protest; that in consequence Russia, by the treaty of 1825, withdrew her pretentions; that the United States in acquiring Alaska had acquired no right, and prior to 1886 exercised no authority, over non-territorial waters of the Pacific Ocean or of Bering Sea; finally, that Great Britain favored the adoption of measures to prevent the extinction of the Alaskan seals.

The arbitrators met at Paris, March 23, 1893. On August 15th the award was delivered. By its terms both Great Britain and the United States were directed each to prevent their subjects from killing or hunting seals within a radius of 60 miles around the Pribilof Islands, and, during the breeding season, in any part of the Pacific Ocean north of lat. 35° N. or east of long. 180°. But the court denied the claim of the United States to the right of protection of the seal when found outside of the ordinary three-mile limit, and found that in the treaty of 1825 the phrase *Pacific Ocean* included Bering Sea. The question of an award of damages for vessels seized prior to the declaration of a *modus vivendi* was left to be settled by diplomatic negotiation. In September, 1894, Secretary of State Gresham sought to end the negotiation by an agreement to pay $425,000 in full settlement of all damages. But Congress refused to ratify the agreement, claiming the amount to be excessive, because many of the seized vessels were in reality American schooners fraudulently sailing under British colors, and the matter was again referred to arbitration. In June, 1896, the text of a convention was made public, by the terms of which a tribunal was provided for, to consist of two commissioners, one from Great Britain and the other from the United States; this tribunal was to meet either at Victoria, British Columbia, or at San Francisco; the commissioners were to award damages for seizures made before the court of arbitration was organized and the *modus vivendi* declared; and in case of their being unable to reach an agreement, an umpire was to be appointed by the two governments, or by the President of Switzerland; the decision of the tribunal was to be final, and the award paid within six months after it was agreed upon.

Preparatory to the work of this commission, the President of the United States appointed, June 12, 1896, a commission of scientists of reputation to make a thorough investigation of the condition of the fur-seals of Alaska and to report the results of their examination to Congress. This commission's work did much toward throwing the proper light upon the question of the extermination and preservation of the seal. The members appointed were: David Starr Jordan, president of Leland Stanford University, California, chairman; Commander J. F. Moser, of the United States Fish Commission steamer *Albatross;* Dr. Leonard Steyneger and Frederick A. Lucas of the United States National Museum; and C. H. Townsend of the United States Fish Commission.

BERJA, town of the province Almeria, southeast Spain, 22 miles W. of the city of Almeria; has lead-mines, and manufactures linen and hardware. Population, about 14,000.

BERJEAU, Jean Philibert, French writer and book-collector; born in Ballon, France, in 1809; died in London, Nov. 8, 1891; studied at Chateau-Gontier; became a notary's clerk; was in the government army in 1830 and again in 1838; again took up his work with the notary; in 1839 he published *Le Commanditaire,* a one-act comedy; in 1840 he published *Seguidillas.* The next eight years he spent in travel. Upon his return he joined in the publication of the newspaper, *La Vraie République;* prosecuted on account of the numerous offenses of the press, he was included in the general condemnation of 1851, and fled to England. He issued, in London, until 1879, a series of publications for those who were seeking rare and curious books; among such publications were *Le Second Voyage de Vasco de Gama,* an English version of a Dutch text, and *Le Bibliophile Illustre.*

BERKELEY, a town in Alameda County, western central California, 9 miles N.E. of San Francisco, on the Southern Pacific railroad. The University of California, the California Institution for the Deaf, Dumb and Blind, and the State Agricultural College are here located. Its principal industries are planing-mills and screen-manufactories. Population 1890, 5,101.

BERKELEY, Miles Joseph, an English botanist; born at Biggin, England, in 1803; died at Sibbertoft, July 30, 1889. He was graduated at Christ's College, Cambridge, in 1825; educated for the church, and obtained a number of ecclesiastical preferments, his last charge being the parish of Sibbertoft; but his fame rests on his botanical researches and writings, among them *British Fungi; An Introduction to Cryptogamic Botany;* and *Outlines of British Fungology.*

BERKELEY, Sir William, colonial governor of Virginia; born near London, England, about 1610; died at Twickenham, July 13, 1677. He was highly connected, a graduate of Oxford, a traveler and accomplished courtier. The king honored him with a commission to Canada in 1632, and in 1641 appointed him governor of Virginia. During his first term of office he won the regard of the people and managed business with great shrewdness. When

Cromwell became Protector, Berkeley influenced the people not to acknowledge his authority, and a fleet was sent from England to bring the colony and its governor to terms. Berkeley's diplomacy soon made matters smooth with the home government, but he had to resign his office. At the restoration Charles II reinstated Berkeley, but his second term of office was unsatisfactory. The so-called "Bacon rebellion" arose, provoked by Berkeley's faithlessness towards the Indiana and his duplicity with regard to the patriot Bacon. The governor saw how unpopular he was making himself by his erratic conduct, and he became bitter and inhuman. After Bacon's death he persecuted his followers, and executed them with such indecent haste that the king said he had "taken more lives in that naked country than I have for the murder of my father." Berkeley was opposed to free schools, printing and religious liberty. Charles II recalled him, intending to examine into the reports of his harsh measures, but Berkeley died soon after his return to Europe.

BERKLEY, a town in Norfolk County, southeast Virginia, on the Elizabeth River, opposite Norfolk, and on the Norfolk and Southern railroad; has good schools, a knitting-mill, lumber-mills and ship-building. Population 1890, 3,899.

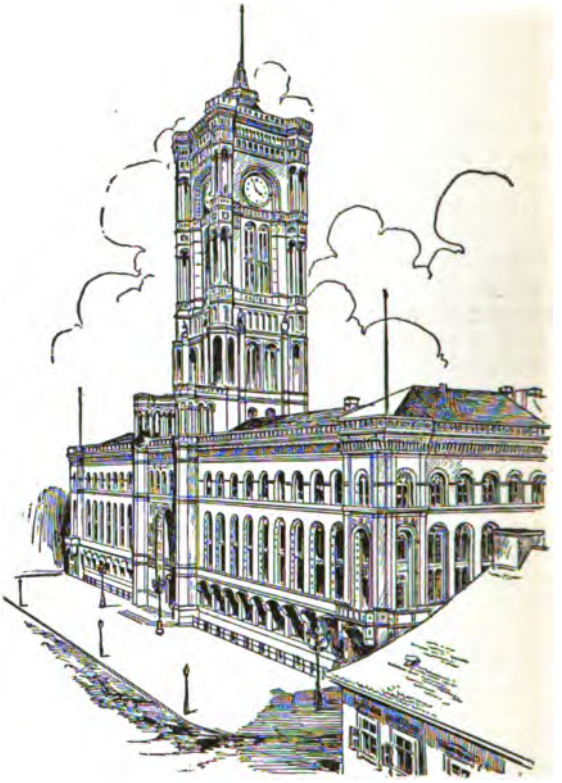
BERKLEY, Sir George, civil engineer; born in London, April 26, 1821; died Dec. 20, 1893. From 1835 to 1841 he worked as apprentice in machine-shops; was assistant to Robert Stephenson on the Northeastern and the Eastern Counties railroads from 1841 to 1849; from 1849 to 1859 examined the water-supply of Liverpool, representing Stephenson; was assistant and then chief engineer of the Great Indian Peninsular railroad; was consulting-engineer for railways in Natal and viaducts in Cape Colony for the colonial office in 1874; consulting engineer to the Indian Midland railroad in 1885; and engineer to the Argentine Northeastern railroad in 1887. He was a prominent member of the Institute of Civil Engineers and active in the management of the Royal Institution. In May, 1893, he was knighted.

BERKLEY SPRINGS or BATH, a town, the capital of Morgan County, northeast West Virginia; 50 miles E. of Cumberland, Maryland, on the Baltimore and Ohio railroad; has medicinal springs that are frequented for the cure of rheumatism and catarrh; has also a tannery. Population 1890, about 800; no return separate from the district of Bath having been made.

BERLICHINGEN, Götz von, German knight; the last worthy representative of the chivalry of the middle ages; born at Jaxthausen, Würtemberg, in 1480; died July 23, 1562; at the siege of Landshut lost his right hand and replaced it with an iron hook, on account of which he was named "Götz of the Iron Hand"; engaged in feuds between the German princes; was the leader in the peasants' war of 1525; was made prisoner for 11 years; afterwards took part in campaigns in Hungary and France; wrote an autobiography which furnishes an excellent account of life in his period. His career furnished the basis for Goethe's drama, *Götz von Berlichingen*.

BERLIN, capital of Prussia, and seat of government of the German Empire. (For history, description and institutions, see Berlin, Vol. III, p. 593.) In 1890 the population of Berlin had reached 1,580,000. Private houses of more than five inhabited stories, and over 72 feet high, were prohibited in 1887. The increase in the value of house property has been enormous, and the result is, that about one tenth of the population are driven to take up their abode in cellars underground, and more than 63,000 families live in dwellings of one room.

Berlin contains very many fine public buildings, the recent additions to these including the Industrial (1881), Ethnological (1886) and other museums, the Academy of Music, the Observatory, the



THE REICHSTAG BUILDING, BERLIN.

new Cathedral, the new Reichstag or Parliament Hall, in which the German Parliament assembled for the first time in 1894, many scientific and learned societies, several seminaries, and a large number of public and private institutions for benevolent uses. Among its fourscore elegant churches, the Michaelskirche (Catholic), Thomaskirche, Zionskirche, Dankeskirche (1884) and Heiligekranzkirche (1887) are the finest and most recent.

The commerce and manufactures of Berlin have increased so rapidly of late years, that it now ranks among the most important mercantile places of continental Europe. The traffic is carried on by the Spree, the canals, and fourteen railways, of which the intramural, or "city railway," opened in 1882, has a length of seven miles, and passes through the middle of the city from east to west, and the suburban or "ring railway," 23 miles long, forms a complete circle round its outskirts. Annually the

city railway carries eight million passengers; the city omnibuses, thirteen; and the tramway cars, seventy million. The traffic by water is 50 per cent greater than that of any inland town of Germany, amounting in one year to 3,716,000 tons. The staple commodities are grain, cattle, spirits and wool. The Exchange, daily visited by 3,500 persons, is the center of the North German money market. The Reichsbank is the chief bank in Germany for the issue of notes. It has $30,000,000 of paid-up capital, and 218 branch offices. The principal branches of industry are woolen-weaving, calico-printing and the manufacture of engines and other machinery (for which there are now 100 establishments), also of iron, steel and bronze wares, woven goods and confections. Of ladies' mantles alone Berlin produces annually $25,000,000 worth (two-thirds for export trade). It has also very important manufactures of railway and other carriages, sewing-machines, safes, telegraphic apparatus, scientific instruments, chronometers, steel pens and jewelry.



THE BRANDENBURG GATE, BERLIN.

In 1890 the new system of carrying off and disposing of the sewage of the city was completed. This is the sewage farm system successfully adopted in some cities in England, but first used on a large scale in Berlin. The city is divided into districts, each one having an independent sewerage system. The sewage is collected at a central point in each district, and pumped from there by means of a tunnel to outlying waste tracts. There the refuse is so treated as to make it a means of fertilizing the land. This is perhaps the best system of drainage in use by any city in the world.

The government of the city consists of the legislative body, the council, and the executive department. The executive consists of a mayor, who is selected for his executive ability, regardless of politics, and 34 magistrates. The council is composed of 108 members, elected for 6 years, the terms, of 36 expiring every two years. The office of councilman is purely honorary, being unsalaried. Council meetings are held on Thursdays of each week and are open to the public. Of the magistrates, 19 are paid for their services; these, together with the mayor, are elected for 12 years, and if not re-elected are accorded a pension. The remaining magistrates hold office for six years. The civil service system is strictly enforced, and is applied to all grades of officers, excepting the heads of departments. A property or tax qualification is exacted from all voters. The voters are divided into three classes: (1) those men, beginning with the richest, whose combined taxes make up one third of the whole city tax; (2) of those whose taxes equal a second third; and (3) of the remainder. Each division has the privilege of electing one third of the council. All the tramways, gas and electric-lighting plants and the telephone system are the property of the city.

BERLIN CONGRESS OR BERLIN TREATY, a meeting of the representatives of the European powers held in Berlin from June 13 to July 13, 1878, to decide on disputes growing out of the Turco-Russian war of 1877. The nations represented were England, France, Germany, Austria, Russia, Italy and Turkey. It was called at the suggestion of Austria by Prince Bismarck in behalf of Germany. The men who, as representatives of their respective governments, were most influential in bringing the negotiations to a successful close were: For Russia, Count Gortschakoff; England, Lords Beaconsfield and Salisbury; Austria, Count Andrassy; Italy, Count Corti; France, M. Waddington; Turkey, Carathéodori Pasha; and Germany, Prince Bismarck, who acted as president of the conference. For terms of the treaty, its previous history and results, see TURKEY, Vol. XXIII, p. 652.

BERLIN, UNIVERSITY OF. (For early history, see BERLIN, Vol. III, p. 596; and UNIVERSITIES, Vol. XXIII, pp. 848, 849.) The university, like all of the higher educational institutions of Germany, is controlled by the state, supported by the state, and all its officers are state officers. In 1883 Berlin University received from the government about $1,000,000, which is the largest sum received by any of the German universities, the average income being $250,000. The optional system in selection of studies, the system in use throughout the empire, prevails. There were, in 1892, 336 members of the faculty, including all instructors and lecturers. About 800 courses are offered each year. In 1891 there were enrolled 5,527 students, about one tenth of whom were Americans.

BERLIN, a town, the capital of Waterloo County, southwest Ontario, Canada, on Grand River, about 60 miles W. of Toronto, and on the Grand Trunk railroad. It contains a number of manufactories, the chief staples being buttons, malt liquors and leather. It has a Catholic college and a large number of churches, numerous hotels and substantial business blocks. Population 1891, 7,425.

BERLIN, a city of Green Lake County, southeast Wisconsin, situated on Fox River, about 100 miles N.W. of Milwaukee and on the Chicago, Milwaukee and St. Paul railroad. Here are extensive foundries and manufactories of turbine wheels, woolen goods, flour, whips, boots and shoes and leather. Cranberries and dairy products are among the principal articles of trade. Extensive granite-quarries are located here, most of their products being shipped to Chicago, and, when crushed, used in street-paving. Population 1890, 4,149.

BERLIN DECREE. See CONTINENTAL SYSTEM, in these Supplements. See also TURKEY, Vol. XXIII, p. 652.

BERMUDA GRASS (*Cynodon Dactylon*) is a low, creeping perennial grass, probably a native of India,

but now found in most warm and tropical countries. Its great endurance of drought has caused it to be a very valuable pasture and hay grass in many regions, but in others the great difficulty of its eradication has made it a pest. Also called "Bahama grass."

BERMUDA HUNDRED, a village in Chesterfield County, east-central Virginia, on the right bank of the James River, above the mouth of the Appomattox, 18 miles S.E. of Richmond. It became known as the headquarters of General Butler during the siege of Petersburg and as a position selected by him in 1864, when he commanded the army of the James, numbering about 25,000 Federals, where he might intrench himself and await Grant's arrival. In the vicinity of this position there was constant fighting between Butler's troops and those of the Confederate Gen. Beauregard, whose forces were 20,000 strong. The fighting continued from May 16th to 30th. On the 16th Heckman's brigade was destroyed by the Confederates, who were then pushing on to Bermuda Hundred, when Ames and Gilmore came up, and Beauregard's plans miscarried. On the 19th the Confederates assaulted the rifle-pits, under Ames and Terry, but without success. Skirmishing continued until the 30th, when the Confederates desisted. Bermuda Hundred was a valuable position, since it was very near both Richmond and Petersburg. Butler's enforced inactivity gave rise to the phrase, "Bottled up in Bermuda Hundred."

BERMUDAS, a British colonial possession, consisting of 360 small islands in the Atlantic Ocean, 568 miles E. of North Carolina, and 677 miles from New York. Of these islands but 20 are inhabited. Total area, 20 square miles (12,000 acres—4,000 under cultivation). Population in 1893, 15,519, including 5,916 whites. Capital, Hamilton, with a population of about 1,300. For early history and description, see BERMUDAS, Vol. III, pp. 599, 600.

There were, in 1893, 47 schools, with about 1,400 students, 23 of these schools receiving government grants to the amount of $8,250 annually. Average strength of imperial troops, 2,913. In 1894 the revenues were estimated at $162,375, and the expenditures at $171,080. Public debt in 1894, $235,500. The value of onions exported in 1894 was $231,615; lily bulbs, $91,805; and potatoes, $98,050. The total exports in 1894 amounted to $491,885. The imports that year amounted to $1,430,235. In 1890 the laying of a cable telegraph to Halifax, Nova Scotia, was completed.

BERMUDEZ, a state in the northeast part of Venezuela, between the Orinoco and the Caribbean Sea, formed in 1881 from the former states and present sections of Barcelona, Cumaná, and Maturin. Area, 32,243 square miles; population, 300,000. Its principal cities are Barcelona, Cumaná, and Maturin. There are a number of silver-mines within its territory, also iron, coal and copper. Within its bounds is Bermudez Lake, 100 miles from the island of Trinidad. It contains an immense deposit of asphalt.

BERNALILLO, a town in Bernalillo County, northwest New Mexico, situated on the Rio Grande, about 15 miles above Albuquerque, on the Atchison, Topeka and Santa Fé railroad. It is an old town and the seat of a convent; is the Tiguex of Coronado's time. It is an important outfitting station for the adjacent mining-regions, and is the commercial and manufacturing center of an extensive wine-producing and fruit-growing district. Population about 1,000.

BERNARD OF CLUNY, born in Morlaix, Brittany, about 1140, sometimes confounded with Bernard of Clairvaux, was a monk at Cluny under Peter the Venerable. It is from Bernard's great work, *De Contemptu Mundi*, that Dr. Neale translated *Jerusalem the Golden* and other hymns. See HYMNS, Vol. XII, p. 584.

BERNARD, CLAUDE, physiologist; born at Saint-Julien, in the south of France, July 12, 1813; died in Paris, Feb. 10, 1878. In 1854 he was appointed professor of general physiology in the Faculty of Sciences in Paris, and in 1855 professor of experimental physiology in the College of France. Among his writings are *Nutrition and Development* and an *Introduction to the Study of Experimental Medicine*. He discovered the saccharine functions of the liver, and the existence of the vasomotor system of nerves. See PHYSIOLOGY, Vol. XIX, p. 11.

BERNARD, SIR FRANCIS, lawyer and colonial governor; born in Nettleham, Lincolnshire, England, in 1714; died at Aylesbury, England, June 16, 1779. He graduated at Oxford, and served in different offices of importance until 1768, when he was appointed governor of New Jersey. He was appointed to the same office in Massachusetts Bay Colony. He administered the office satisfactorily in the former colony, and for the first nine years in the latter place. The library of Harvard College was burned in 1764, and the governor, who took quite an interest in the college (his third son graduated from the institution in 1767), assisted in procuring funds for its restoration. About that time two political parties arose—a royalist faction and a popular party. In trying to strengthen the former, Governor Bernard executed harsh measures and put down popular leaders, thereby arousing great indignation and precipitating the final struggle between the mother-country and her colonies. It is affirmed that he did more to hasten the Revolution than any other man. He had a quick, ungovernable temper—the unhappy faculty of doing just those things which would harass a people already on the brink of rebellion. Conciliatory measures he never tried. The king recalled him, yet he remained nominal governor for two years after his return to England.

BERNARD, THOMAS DEHANY, English clergyman; born in Clifton, England, Nov. 11, 1815; educated at Exeter College, Oxford; vicar of Great Baddow in 1841; canon residentiary of Wells Cathedral in 1868; in 1869 chancellor of Wells Cathedral. Among the best of his writings are *The Witness of God; Five Sermons Preached at Oxford; The Progress of Doctrine in the New Testament;* and *Before His Presence with a Song.*

BERNARD, GREAT ST., a mountain pass in the Pennine Alps, 8,120 feet in height, the connecting pass between Martigny, Switzerland, and Aosta, Italy. On its summit is the famous St. Bernard

hospice, occupied by monks of the St. Augustine order, who are the keepers of the dogs trained to rescue travelers. This hospice was founded in 962 by Bernard de Menthon; it is capable of giving shelter to 300 persons. The pass was used in ancient times by the Romans and Gallic tribes, and later by Napoleon, who, in 1800, led 30,000 troops through it.

BERNARD, LITTLE ST., an Alpine pass, connecting the valley of the Isère, France, and the valley of the Dora Baltea, Italy, 7,176 feet in height. This is the most convenient of the Alpine passes, and is supposed to be the one used by Hannibal in 218 B.C.

BERNARDINE MONKS OR BERNARDINES. See CISTERCIANS, Vol. V, p. 793; ENGLAND, Vol. VIII, p. 372.

BERNARDO DEL CARPIO, a semi-mythical hero of the old Spanish ministrels; said to have been a nephew of Alphonso the Chaste; the person who attacked Orlando at Roncesvalles, and finding it impossible to wound him, put his arms about him and squeezed him to death. He figures as the hero in several dramas by Lope de Vega.

BERNAUER, AGNES, the daughter of a citizen of Augsburg, and the heroine of a sad romance of the fifteenth century. Duke Albrecht of Bavaria, only son of the reigning Duke Ernst, seeing her at a tournament, fell in love with her beauty, and they were secretly married. When it was proposed that he should marry Anna, daughter of Erich, duke of Brunswick, Albrecht declared his marriage with Agnes Bernauer, and brought her to the castle of Straubing as Duchess of Bavaria. Duke William, Albrecht's uncle, befriended the young people; but after his death, and during the absence of Albrecht, Agnes was arrested by order of her father in law, charged with sorcery, and drowned in the Danube. On his return, her husband, maddened by the outrage, gathered the enemies of his father, and taking arms against Duke Ernst, they devastated the country. See STRAUBING, Vol. XXII, p. 591.

BERNAYS, ALBERT JAMES, chemist; born in London, Nov. 8, 1823; died in London, Jan. 5, 1892. He studied at King's College and at the University of Giessen; from 1854 to 1860 was lecturer on practical chemistry at St. Mary's Hospital; from 1860 to 1892 professor of chemistry at St. Thomas's Hospital. Among his writings are *Household Chemistry; Notes for Students in Chemistry;* and *Skeleton Notes on Analytical Chemistry.*

BERNAYS, JACOB, Greek scholar and critic; born in Hamburg, Sept. 18, 1824; died at Bonn, May 26, 1881. From 1854 until his death he was librarian and professor extraordinary at Bonn. His opinion as a classical critic was highly valued. Classical scholars place a high estimate on his published works, among which are treatises on the dialogues of Aristotle, Theophastrus and the apocryphal letters of Heraclitus.

BERNE-BELLECOUR, ÉTIENNE PROSPER, a French artist; born at Boulogne-sur-Mer, June 29, 1838. His earlier works were portraits and landscapes, but his fame rests upon his later *genre* and military paintings, especially those presenting scenes of the Franco-Prussian war. Among these are *In the Trench; The Sharpshooters at the Combat of Malmaison;* and *A Cannon-Shot.*

BERNHARD, DUKE OF WEIMAR, a German general; born in Weimar, Aug. 6, 1604; died at Neuberg-on-the-Rhine, July 8, 1639. He was the youngest of eight sons of John, third duke of Saxe-Weimar. On the outbreak of the Thirty Years' War he took the side of Protestantism, and distinguished himself in 1622 at the battle of Wimpfen; became colonel in the army of Christian IV, king of Denmark; took part in the bold expedition of Mansfeld through Silesia to Hungary, and after the death of the latter reunited himself with the Danes under the margrave of Baden-Durlach. At the solicitation of his brothers he withdrew from the Danish service, and returned to Weimar in 1628. Three years later Gustavus Adolphus made his appearance in Germany, and Bernhard was one of the first who flew to his standard. After a brilliant career he became suddenly ill, dying probably of poison administered by his physician. His biography was written by Bernhard Roese, and published in 1829.

BERNHARDT, ROSINE, called "Sarah," a French actress; born of Jewish parents in Paris, Oct. 22, 1844. She was baptized into the Christian faith, and brought up in a convent at Versailles. Entering the Paris Conservatoire in 1858, she gained second prizes for both tragedy and comedy, and in 1862 made her *début* as "Iphigénie" at the Theâtre Français, but attracted so little notice that she soon left the theater, only to meet with still less success in burlesque at the Gymnase and Porte St. Martin. In 1867 she played minor parts at the Odéon, and became famous by her impersonation of the Queen of Spain in *Ruy Blas*, and of Zanetto in Coppée's *Passant.* She was called to the Theâtre Français in 1872, and after 1879 made annual appearances with marked success in London. Her tours in North and South America, in Italy, Russia, etc., were also pecuniarily successful; but her essay at the management of a Paris theater involved her in heavy debt. In 1882 she was married to M. Jacques Daria, or d'Amala, a Greek actor, from whom she was divorced shortly afterward, and who died in August, 1889. Her later successes as an actress have been in *La Tosca, Joan of Arc* and *Cleopatra.* Mme. Bernhardt visited the United States in 1887, 1891 and 1896, each visit increasing her popularity. She is probably the greatest tragedienne since Rachel, and in comedy also she ranks as a finished actress. Her talent as an artist is considerable, and both paintings and statues from her studio have appeared in the Salon.



SARAH BERNHARDT.

BERNHARDY, GOTTFRIED, a German scholar; born of Jewish parents near Frankfort, March 20, 1800; died at Halle, May 14, 1875. He was educated

at Berlin; from 1823 to 1825 was docent and professor at Berlin, and in 1829 became director of the philological seminary at Halle. Of his numerous philological works may be mentioned his *Syntax der Griechischen Sprache* (1829); *Paralipomena Syntaxis Græcæ* (1854); and the critical edition of *Suidæ Lexicon* (4 vols., 1834–53). His works on Roman and Greek literature, especially the history of the latter, are also of high value.

BERNICIA, a form of the word *Bryneich*, used to indicate the northern part of what became the kingdom of Northumbria, the part north of the Tees. The Anglian kingdom of Bernicia is said to have been founded by Ida, who made his capital at Bamborough about A.D. 550. See ENGLAND, Vol. VIII, p. 270; NORTHUMBERLAND, Vol. XVII, p. 568.

BERNIER, FRANÇOIS, a French physician and traveler; born at Angers, in France; died at Paris Sept. 22, 1688. Having taken his degree of doctor, he departed for the East in 1654, and visited Syria, Egypt, Arabia and India; in the last he resided for twelve years, in the capacity of physician to Aurungzebe. He published an account of his travels in 1670. The work is delightful in style, as well as in the description of places, and clear in exposition of the causes of those political events that carried Aurungzebe to the throne.

BERNINA, a mountain of the Rhætian Alps, upwards of 13,000 feet high, in the Swiss canton of Grisons, with a remarkable and extensive glacier, Morteratsch. The Bernina Pass, which is 7,628 feet high, unites the valleys of the Engadine and Bregaglia on the north, with Valteline on the south, but is dangerous on account of avalanches. See VALTELLINA, Vol. XXIV, p. 45.

BERNSTEIN, GEORGE HEINRICH, Orientalist; born at Kospeda, near Jena, in 1787; died April 7, 1860. He was chosen professor of oriental languages at Berlin in 1821; in 1843 went to Breslau; devoted himself to the study of theology, philosophy and Eastern languages; his greatest achievements were in Syriac literature. He contemplated publishing a great Syriac lexicon, but did not live to complete the work. Among his writings are an *Arabic Grammar; Chrestomathy;* and *Hitapadesa.*

BERNSTORFF, JOHANN HARTWIG ERNST, statesman; born in Hanover, May 13, 1712; died in Hamburg, Feb. 19, 1772. He became Minister of Foreign Affairs of Denmark in 1751, remaining in office until 1770; was largely instrumental in the negotiation of the treaty in which Russia exchanged Holstein for Oldenburg; did much to promote commerce, and was a generous patron of the fine arts.

BEROË, a genus of *Cœlenterates*, belonging to the class of *Ctenophores*. In form they are sac-like, and of a delicate, transparent, jelly-like substance. They are phosphorescent.

BERŒA, ancient city of Syria, mentioned in the MACCABEES. See ALEPPO, Vol. I, p. 477.

BERRI OR BERRY, formerly a province of central France, now forming the departments of Indre and Cher. Having come, in 1100, into the possession of the French crown, it was raised to a duchy in 1360, and gave title at various times to French princes, the younger son of Charles X being the last who held it.

BERRIEN SPRINGS, a village in Berrien County, southwest lower Michigan, 70 miles E. of Chicago; medicinal springs are located here; has good schools; a planing-mill is in operation. Population 1894, 1,519.

BERRYVILLE, a village, the capital of Clarke County, northern Virginia; 12 miles E. of Winchester, on the Norfolk and Western railroad, in the Shenandoah valley. The district including it was originally platted by Washington. During the Revolution it was given the name of Battletown, on account of the many battles fought there by General Morgan. Population 1890, 1,215.

BERSAGLIERI, the Italian name for riflemen and sharpshooters of the Sardinian army. See ARMY, Vol. II, pp. 612, 613.

BERSERKER OR BERSERK, derived from the Icelandic *berserkr*, meaning either "bare-sark," without a shirt, or, more probably, "bear-sark," having a bear's shirt or hide. Berserker, grandson of the eight-handed Starkader and the beautiful Alfhilde of Norse mythology, is represented as a hero who, despising mail and helmet, went always into battle unharnessed, his fury serving instead of defensive armor. The *berserkers* of later times were a class of warriors who are said to have performed extraordinary feats in battle under the influence of fits of fury called *berserksgang*, "Berserker's rage," which made them howl like wild beasts, foam at the mouth and gnaw the rims of their shields, and was supposed to endue them with superhuman strength and to render them proof against fire and steel.

BERSEZIO, VICTOR, Italian novelist and dramatist; born in Peveragno, Coni, Italy, in 1830. He early gave evidence of his taste and ability; when he was 11 years of age he wrote a series of poetical librettos. He was a contributor to various liberal journals. Among his many writings are *Nouvelles Piémontaises; Il Piacere della Vendetta; Segreto d'Adolfo; Una Botta di Sapone*, a three-act comedy; *Uno Zio Milionario*, a four-act comedy; and *Le Disgrassie d'Monsù Travett.*

BERSIER, EUGÈNE ARTHUR FRANÇOIS, French clergyman; born in Morges, Switzerland, Feb. 5, 1821; died in Paris, Nov. 19, 1889. From 1855 until his death he was a pastor of the Reformed Church of France in Paris. Was perhaps best known on account of his pulpit oratory. Many of his writings have been translated into English; among these are a volume of sermons and his *Coligny.*

BERT, PAUL, a French statesman and physiologist; born at Auxerre, Oct. 17, 1833; died in Hanoi, Nov. 11, 1886. He studied law and medicine, and occupied successively the chairs of physiology at Bordeaux and Paris. Entering political life in 1870, on the proclamation of the republic he was four times re-elected to the Chamber, and during the premiership of Gambetta held the post of Minister of Public Instruction and Worship. While engaged in public life, M. Bert still pursued with ardor his scientific investigations, attracting world-wide attention by his experiments in vivisection. He was appointed by the French Ministry to the governorship

of Tonquin and Annam in 1886, but held the position for a short time only, his death occurring in November of the same year. Among his writings on physiology are *La Pression Barometrique; Notes d'Anatomie et de Physiologie Comparées;* and among his historical works, *Les Morales des Jésuites.*

BERTEAUX, HELENA HÉBERT, French sculptress; born in Paris in 1825; the daughter of the sculptor, P. Hébert; exhibited her first work at the Salon of 1849, using the pseudonym of "Alleit"; since then has done a great deal of work, many pieces attracting general attention. Of these a few are *Assomption de la Vièrge,* a group; *Jeune Gaulois Prisonnier des Romains; Portrait du Petit Pierre;* and *Psyché sous l'Empire du Mystère.* She is the founder and president of the Society of Female Painters and Sculptors. Her husband, M. Léon Berteaux, is also a sculptor of repute.

BERTHEAU, ERNST, German Hebrew scholar; born in Berlin, Nov. 23, 1812; died at Göttingen, May 17, 1888. From 1843 until the time of his death he was professor of Hebrew at Göttingen University. He published a series of commentaries on parts of the Old Testament. These are included in the *Kurzgefasstes Exegetisches Handbuch.*

BERTHELOT, PIERRE EUGÈNE MARCELIN, a French chemist, the son of a physician; born at Paris, Oct. 25, 1827. From a very early age he devoted himself to scientific studies, and made special researches in the synthesis of fatty bodies and alcohol and the phenomena of thermo-chemistry. The degree of doctor of science was conferred upon him in April, 1854; in 1861 the Academy of Sciences awarded him the sum of 3,500 francs for his researches; in 1859 was appointed professor of organic chemistry at the Superior School of Pharmacy; in 1865, at the request of the Academy of Sciences, a new chair of organic chemistry was created for him at the Collège de France. He was elected a member of the Académie de Médecine in February, 1863, and entered the Académie des Sciences, March 3, 1873, in the place of Duhamel. He was one of the founders, and in 1885–91 the director, of the *Grand Encyclopædia.* On Sept. 2, 1870, he was elected president of the Scientific Committee of Defense, and during the siege of Paris was engaged in the manufacture of guns and ammunition, and especially of nitroglycerin and dynamite. The labors of M. Berthelot have had for their object, principally, the reproduction of the substances which enter into the composition of organized beings, and his labors have opened a new field for science, which, up to his time, had limited itself almost entirely to analysis. The dyeing trade has benefited by his discoveries in extracting dyes from coal-tar. He invented a gas-thermometer intended for recording high temperatures accurately and quickly, and also made valuable discoveries in connection with natural gas. M. Berthelot was decorated with the Legion of Honor in 1861, made an officer in 1867, commander in 1879, and grand officer in 1886, in which year he became, for a short time, a member of the French Cabinet. In 1889 he was elected Sécrétaire Perpetuel de l'Académie des Sciences de Paris. In 1895 became Secretary of Foreign Affairs in the Bourgeois Cabinet, resigning in March, 1896.



PIERRE E. M. BERTHELOT.

BERTHET, BERTRAND, French novelist; born at Limoges, June 9, 1815; died in Paris, Feb. 1, 1891. He moved to Paris in 1834. Published a collection of stories under the title *La Veilleuse,* using the pseudonym of "Elec Raymond." He contributed to many of the Paris journals, and received the decoration of the Legion of Honor in 1863. His published writings make over one hundred volumes, of which *La Croix de l'Affût* and *Le Secret du Diamant* are representative.

BERTHIER, ALEXANDRE, prince of Neuchatel and Wagram, and marshal of the French Empire; born at Versailles, Nov. 20, 1753; died in Bamberg, Bavaria, Jan. 1, 1815. He joined the army in 1770, and with Lafayette took part in the American Revolution. He accompanied Napoleon to Egypt as chief of staff. At the revolution of the 18th Brumaire (1790), he became War Minister. He was created sovereign Prince of Neuchatel in 1802, and Prince of Wagram in 1809. He was Napoleon's proxy in the marriage of Maria Louisa at Vienna in 1810. He held the rank of chief of staff, and also that of quartermaster-general, during the campaigns of 1812, 1813, and 1814, and was continually at the Emperor's side. When Napoleon returned from Elba, Berthier left the service of Louis XVIII, preferring neutrality, and retired to Bamberg, Bavaria, where he fell from a window and was killed. He left his *Memoirs,* which were published in 1826.

BERTHIERITE, named after its discoverer, Paul Berthier. See MINERALOGY, Vol. XVI, p. 394.

BERTHOLD OF REGENSBERG, a Franciscan monk, born about 1220; died at Regensberg in 1272. See GERMANY, Vol. X, p. 526.

BERTHOLLETIA. See BRAZIL-NUTS, Vol. IV, p. 241.

BERTHOUD, SAMUEL HENRI, French author; born at Cambrai, Jan. 19, 1804; died at Paris, March 26, 1891. He contributed much to newspapers and magazines, among the latter to the *Revue des Deux Mondes;* he began in 1831 his collection of *Chroniques et Traditions Surnaturelles de la Flandre;* in 1832 he went from Cambrai to Paris and entered upon a brilliant career. He became an officer of the Legion of Honor. Among his numerous published works are *l'Honnête Homme; Daniel; El-Hioudi; Fantaisies Scientifiques,* published over his pseudonym, "Sam"; and *La France Historique, Industrielle et Pittoresque.*

BERTI, DOMINIQUE, Italian statesman and writer; born at Cumiana, Dec. 17, 1820; studied at Turin; hesitated between philosophy and politics; became a member of the Sardinian legislature in 1848; and ever since that time has been a member of the Piedmont and Italian parliaments; was Secre-

tary of Agriculture under Rattazzi; was professor of philosophy at Turin in 1849, and at Rome from 1871 to 1877; in 1865 he was Minister of Public Instruction and Commerce; and was again Minister of Agriculture from 1881 to 1885. His writings on philosophy include *La Philosophie au XVI Siècle* and *Le Platonisme.* His political writings were numerous; among them are *Le Parlement Sarde et Vincent Gioberti; Constituante Italienne;* and *Toscane, Piémont et Rome.*

BERTILLON, ALPHONSE, French anthropologist; born in Paris in 1853; chief of the identification service of the Paris prefecture of police; is the inventor of the system of identification of criminals by minute measurements and defects, in use in almost all European countries, and lately introduced in the United States. At the time of this invention, 1880, he entered the Paris service, taking his present position. He has written several works along anthropological lines, including *Modern Ethnology of Savage Races,* and *The Substitution of Identification by Anatomy for that by Appearance.*

BERTILLON SYSTEM of identification of criminals; invented in 1880 by Alphonse Bertillon and introduced in Paris in 1882. Briefly summed up, the system depends upon a series of accurate and minute measurements of the human body, assisted by photographs. These photographs are not merely photographs of the face, which have been found inefficient on account of the rapidity with which a professional rogue can change his facial appearance. Photographs of particular features are made use of; for instance, in 100,000 persons, no two have exactly the same kind of a nose. But the system depends upon bone measurements, which, in an adult, never change. The parts measured are the head, foot, middle finger, the extended forearm, height, breadth, the trunk of the body and the ear. These measurements placed upon a card take the place of the photographs in the "rogue's gallery." The system is now in use in all large cities of Europe, and was adopted by the police of New York City in 1895.

BERTRAND, HENRI GRATIEN, COUNT, French general; born in Chateauroux, March 18, 1773; died there, Jan. 31, 1844. He was one of Napoleon's generals, distinguished for his faithfulness to the emperor through all his fortunes. He early entered the armies of the revolution as an engineer. When the body of Napoleon was carried back to France in 1840, he had a part in the expedition. He compiled the memoirs of Napoleon, dictated at St. Helena, and published in 1847.

BERTRAND, JOSEPH LOUIS FRANÇOIS, a French mathematician; born in Paris, March 11, 1822; evinced from a very early age an extraordinary taste for mathematics, and when eleven years of age, on leaving the College of St. Louis, he entered the École Polytechnique. He was successively professor at the Lycée Saint Louis; examiner for admission at the École Polytechnique, teacher of analysis at the same school, assistant professor of mathematical physics at the College of France, and professor of special mathematics at the Lycée Napoléon. In 1856 he was admitted to the Académie des Sciences in place of Sturm, and on the death of Élie de Beaumont in 1874 was elected perpetual secretary. Besides his three great works, *Traité d'Arithmétique* (1849), *Traité d'Algèbre* (1856), and *Traité de Calcul Différential et Intégral* (1864–70), he has written a number of memoirs relative to physics, pure mathematics and mechanics. He was made an officer of the Legion of Honor in August, 1867.

BERYX, a very ancient genus of fishes, occurring mostly as fossils in the cretaceous formations.

BESA, a town of ancient Egypt on the site of which the city Antinoöpolis was erected by Hadrian in memory of Antinous, on the east bank of the Nile, in Middle Egypt. It was the seat of an oracle of the god Besa.

BESANT, ANNIE, an English writer and teacher; born in London, Oct. 1, 1847; was married to an English clergyman, a brother of the novelist, Walter Besant, but separated from him and devoted herself to the advocacy of various doctrines. In association with Charles Bradlaugh she published a work called *Fruits of Philosophy,* for the obscenity of which she was convicted, but escaped punishment by a technical error in the indictment. She was a pronounced secularist and lectured extensively on secularism. In 1889 she became an adherent to the theosophic ideas advocated by Mme. Blavatsky, and in 1892 lectured on them in the United States. She has since published an autobiography. She returned to London after a short time spent in India, and finally became the leader of the theosophists, the successor to Mme. Blavatsky.

BESANT, SIR WALTER, novelist, born in Portsmouth in 1838, and educated at King's College, London, and Christ's College, Cambridge, where he graduated with high mathematical honors. He was intended for the church, but abandoned this career. He was then appointed senior professor in the Royal College of Mauritius, but was compelled by ill health to resign and return to England, where he has since resided. In 1868 he produced his first work, *Studies in Early French Poetry.* In 1871 he entered into the partnership with the late Mr. James Rice, which produced the series of novels that bear their joint names. He is a contributor to the ENCYCLOPÆDIA BRITANNICA. He was knighted, May 24, 1895. Mr. Besant has also written, under his own name, *The Captain's Room; All Sorts and Conditions of Men* (1882); *All in a Garden Fair* (1883); *Dorothy Foster* (1884); *Uncle Jack* (1885); *Children of Gibeon* (1886); *The World Went Very Well Then* (1887); *For Faith and Freedom* (1888); *The Bell of St. Paul's* (1889); *Armorel of Lyonesse* (1890); and two volumes of collected stories, besides *The Ivory Gate* and a *History of London.*



WALTER BESANT.

BESICLOMETER, a form of gauge used by manufacturers of or dealers in spectacles in measur-

ing the width of the forehead to determine the proper place for hinging the frames. It usually consists of a graduated rod, curved to pass over the bridge of the nose, and bearing sliding-points to mark the proper width.

BESNARD, Paul Albert, French artist; born in Paris, June 2, 1849; studied under Cabanel and Bremond; was awarded the Grand Prix de Rome in 1874; received the decoration of the Legion of Honor in 1888. Included in his paintings are *Source; Une Musicienne; Mlle. Melcy*, a portrait; and *Une Sirène.*

BESSEMER, a town of Jefferson County, central Alabama, 15 miles S.W. of Birmingham, on the Alabama Great Southern, the Kansas City, Memphis and Birmingham, the Louisville and Nashville, and the Southern railroads, in the center of an iron-producing region; has blast-furnaces, rolling-mills, etc.; founded in 1887. Population 1890, 4,544.

BESSEMER, a town of Pueblo County, south-east Colorado, a few miles from Pueblo City, on the Denver and Rio Grande and the Union Pacific railroads; has steel-mills, giving employment to over 1,200 men. Population 1890, 3,317.

BESSEMER, a town, the capital of Gogebic County, near the western extremity of the upper peninsula of Michigan, near Lake Superior, 46 miles E. of Ashland, Wisconsin, on the Chicago and Northwestern, the Duluth, South Shore and Atlantic, and the Wisconsin Central railroads; is in the midst of extensive iron-mines; founded in 1886. Population 1890, 2,566.

BESSEMER, Sir Henry, inventor; born Jan. 9, 1813, at Charlton, Herts; was the son of an artist, and was to a great extent self-taught. He has been a prolific inventor, as the volumes issued by the Patent-Office show. It has been said, indeed, that he has paid in patent-stamp duties alone as much as £10,000. He invented the perforated figure-stamp used in the British stamp-office and in the majority of American banks. The working out of many of his inventions, however, resulted in a loss to himself and to others. His first pecuniary success was obtained by his invention of machinery for the manufacture of Bessemer gold and bronze powders, which was not patented, but the nature of which was long kept secret. His process for the manufacture of steel raised the annual production in England from 50,000 tons by the older processes to as many as 3,000,000 tons in some years. In the United States in 1893 the output of steel was 4,019,995 tons. The cost of steel was reduced by this process more than 500 per cent. Bessemer was knighted in 1879, and has received many gold medals from scientific institutions. He is a fellow of the Royal Society and a member of the Institution of Civil Engineers. He has become very wealthy from the profits of his steel-works.

BESSER, William Frederick, Lutheran clergyman; born in Warnstedt, Germany, Sept. 27, 1816; died in Niederlössnitz, Sept. 26, 1884. He was pastor of churches in Silesia and Pomerania for the greater part of his active life. He was an expounder of texts of the New Testament, and as such became famous. He was associate director of the Foreign Mission Society of Leipsic from 1853 to 1857. The greater part of his sermons were preserved in writing, and are to-day in use in Germany. His *Christ the Life of the World*, and *Christ the Light of the World*, have been translated into English by Mrs. Huxtable.

BESSEY, Charles Edwin, botanist; born in Milton, Ohio, May 21, 1845; graduated at the Michigan Agricultural College in 1869, and afterwards studied at Harvard College; from 1870 to 1884 professor of botany at Iowa Agricultural College; in 1884 he went to the University of Nebraska as professor of botany. In connection with his work in botany he has been one of the editors of the *American Naturalist;* president of the Iowa Academy of Sciences for the eight years following 1873; president of the Society for the Promotion of Agricultural Science; president of the Academy of Sciences of Nebraska; and is a fellow of the American Association for the Advancement of Science. He was acting chancellor of the University of Nebraska from 1888 to 1891. He has published a number of works, among which are *Geography of Iowa; The Erysiphei of North America; Botany for High Schools and Colleges; Essentials of Botany;* and several reports as state botanist.

BESSIÈRES, Jean Baptiste, duke of Istria, marshal of the French Empire; born at Preissac, Aug. 5, 1768; died May 2, 1813. He entered the army as a private soldier; in less than two years was made captain for his services in Egypt and Austria; was promoted in succession to the ranks of general of brigade, general of division, and marshal of France, and in 1809 was created Duke of Istria for his services in Spain. In 1813 he was given command of the whole of the French cavalry. He was mortally wounded on the morning of the battle of Lützen, while leading on foot the tirailleurs to reconnoiter the field from the defile of Rippach, and in him Bonaparte lost one of his best officers and his most faithful friend. The news of his death was concealed from the army throughout the day.

BEST, William Thomas, organist, and composer of organ music; born in Carlisle, England, Aug. 13, 1826; began his first regular work in Liverpool in 1840; in 1855 was appointed organist for St. George's Hall, and has held that position since, together with the positions of organist to the Musical Society of Liverpool and the Liverpool Philharmonic Society. He has written a great number of hymns, anthems, etc., for the organ, and has published *The Modern School for the Organ* and *The Art of Organ-Playing.* Died May 10, 1897.

BETANZOS, a town of the province Corunna, northwest Spain, near the Bay of Betanzos, about 10 miles S.E. of the city Corunna. According to some historians it is the oldest town in Galicia. Ancient granite gateways are still standing at the entrances to some of its narrow streets. Linen, earthenware and leather are manufactured here. Population 1887, 8,122.

BETHAM-EDWARDS, Matilda Barbara, an English authoress; born in Westerfield, England, in 1836, and at the age of 19 published her first novel; has edited *Murray's Handbook for Central France*, making annual trips into France in that connection.

She has written many successful books, among them *The White House by the Sea; The Primrose Pilgrimage; Dr. Campany's Courtship;* and *Six Life Studies of Famous Women.*

BETHANY, a town, the capital of Harrison County, northwest Missouri, 62 miles N.E. of St. Joseph, Missouri, on the Chicago, Burlington and Quincy railroad, in the midst of a rich agricultural region. It has a good high school. Population 1890, 1,200.

BETHANY, a village of Brooke County, northwest West Virginia, 6 miles E. of the Ohio River and 15 miles N.E. of Wheeling. It is surrounded by a rich farming country. Bethany College, founded in 1841, is here. Population 1890, about 500.

BETHANY COLLEGE, Bethany, West Virginia, founded in 1840, under the auspices of the Campbellite Church. In 1895 it had 10 instructors, 150 students and a library of 3,000 volumes; since organization there have been 818 graduates. President, Hugh McDiarmid.

BETHEL COLLEGE, McKenzie, Tennessee; founded in 1847; closed during the Civil War; reopened immediately after the close of the war under the jurisdiction of the Cumberland Presbyterian Church, the West Tennessee synod; President, J. L. Dickens; had, in 1895, 7 instructors and 200 students. It is open to both sexes.

BETHLEHEM, a borough of Northampton County, eastern Pennsylvania; the principal settlement in the United States of the Moravians, or "United Brethren," situated about 50 miles N. of Philadelphia, on the Central of New Jersey, Lehigh Valley, and the Philadelphia and Reading railroads; is on the left bank of the Lehigh River, a bridge across which connects it with South Bethlehem, the seat of Lehigh University, and location of the Bethlehem Iron-Works, a manufacturing plant next in size to the Carnegie works. Bethlehem was founded in 1741. The first house, in which, in that year, Count Zinzendorf and his little band of Moravian brethren celebrated the festival of the Nativity, was not taken down until 1823; and one of the first houses of the settlement is still standing. Besides containing a number of benevolent institutions conducted by the Moravians, Bethlehem is the seat of their theological seminary, boys' school and young ladies' seminary. It was in the latter—used during the Revolution as a military hospital—that Lafayette was nursed, after having been wounded at the battle of Brandywine. The principal manufactures of Bethlehem are flour, brass implements, boilers, shovels and cigars. Population, including South Bethlehem, about 17,000; Bethlehem alone, 6,762.

BETHLEHEMITES, the name of an order of monks at Cambridge, England, in the thirteenth century; also of an order founded in Guatemala in 1673. They dressed like the Dominicans, except that they wore on their breast a five-rayed star in memory of the Star of Bethlehem, which guided the Magi to Bethlehem from the East. The followers of Jerome Huss were styled Bethlehemites, from Bethlehem Church, in Prague, where their leader preached.

BETHPHAGE, literally, "house of figs"; the name of a place in Palestine, on the Mount of Olives, on the road between Jericho and Jerusalem. Mentioned in Luke xix, 29 and Mark ii, 1.

BETHSAIDA, on the lake of Galilee, mentioned in Scripture as the city of Peter and Andrew and Philip, now a heap of ruins almost overgrown with grass. See GALILEE, Vol. X, p. 30.

BETH-SHEMESH, an ancient city of the Holy Land, about 15 miles S.W. of Jerusalem. Ruins at the present village of Ain-Shems lead scholars to believe this was the site of Beth-Shemesh. It marked the north boundary of Judah. It is mentioned in the Scriptures as the place near Ekron where the ark rested; where Jehoash defeated and took prisoner Amaziah, king of Judah, and in its vicinity Samson's exploits were performed. Its last mention in history was in Chron.ii, in the account of its capture by the Philistines.

BETHUNE, GEORGE WASHINGTON, clergyman, born in New York City, March, 1805; died in Florence, Italy, April 27, 1862. He graduated from Dickinson College, Carlisle, Pennsylvania, and from the department of theology at Princeton, after which he became a Presbyterian minister. In 1826 he was chaplain to the seamen of Savannah; from 1826 to 1830 pastor of the Reformed Dutch Church at Rhinebeck, New York; from 1830 to 1834 pastor in Utica, New York; from 1834 to 1848 pastor at Philadelphia, Pennsylvania; from 1848 to 1859 pastor in Brooklyn. Failing health compelled him to visit Europe, where he sometimes preached in the only Protestant church in Rome. A short pastorate in New York was followed by a visit to Florence, Italy, where he died. Dr. Bethune was a well-read student of English literature, a writer of merit, and an orator and man of influence in his times. His published writings include *Memoirs of Mrs. Joanna Bethune; Expository Lectures on the Heidelberg Catechism; Early Lost, Early Saved;* and *Lays of Love and Faith.*

BÉTON OR BÉTON AGGLOMÉRÉ, a kind of concrete used in the construction of submarine works and other buildings. See CONCRETE, Vol. VI, p. 243; see also, under BUILDING, Vol. IV, pp. 456, 457, and under BRIDGES, Vol. IV, pp. 324 et seq.

BETONY, a name applied to a common European labiate plant (*Betonica officinalis* or *Stachys Betonica*) growing in woods. It was of great repute in ancient and mediæval medicine, and is sometimes used to dye wool, producing a dark yellow color. It is often called "wood-betony," to distinguish it from the "water-betony" (*Scrophularia aquatica*). The name "wood-betony" is also applied to *Pedicularis Canadensis* of the United States.

BETTERMENTS are improvements made to an estate which render it of greater value, as buildings, inclosures, etc. The term signifies improvements of a more extensive nature than mere repairs. Betterments also mean the additional or increased value which attaches to real estate by reason of the making of public improvements in proximity to the estate, as laying out streets, providing sewerage, etc.

BETTIA, a municipal town in the northwest of the district Champaran (q.v., Vol. V, p. 386),

province of Behar, northeast India, on the line of the Tirhut State railway. Population, 21,263, of whom 13,943 are Hindus. A Catholic mission has been sustained in Bettia since 1746.

BETTING is the act of risking or laying a bet or wager, consisting of money or other things of value, with another person, upon the result of an event at that time uncertain in its outcome. The amount so risked by the persons making the bet is termed the stake, and is taken by the winner upon the result being determined. Betting, in most of its forms, is made illegal by statute in almost all of the states of this country, and a suit cannot be maintained to enforce the payment of a bet. In many states any contract which is clearly, from the nature of the contract, or from the circumstances surrounding its execution, a gambling contract, is void. Even in the absence of statutory provisions, the courts are not inclined to countenance suits for the recovery of money won by betting. See BETTING, Vol. III, p. 618.

BETTOLA, a town in the duchy of Parma, province of Emilia, northern Italy, about 20 miles S.E. of Piacenza. It is situated on the Nure, in a fertile but only partially cultivated district. Population, about 4,000.

BETTS, SAMUEL ROSSITER, jurist; born at Richmond, Massachusetts, June, 1787; died in New Haven, Connecticut, Nov. 2, 1868. He graduated at Williams College in 1806, and practiced law in Sullivan County, New York. He was called one of the ablest American jurists. He served in the War of 1812; became judge-advocate; was sent to Congress from New York state in 1815; was judge of the circuit court of the state for three years, and from 1826 to 1867 was United States district judge. He was among the first to formulate maritime laws for the United States, and his decisions in this department and in that of patents of national and international rights have been uniformly upheld. He published a work on *Admiralty Practice.*

BETTYS-Y-COED, a village in Carnarvonshire, North Wales, situated at the point where the Conway receives the Llugwy, 15 miles S. of Llandudno Junction by rail. It is remarkable for the beauty of its location and the famous Swallow Falls.

BEUGNOT, ARTHUR AUGUST, COUNT DE, a French statesman and author; born at Bar-sur-Aube March 25, 1797; died in Paris, March 15, 1865. In 1841 he was made a peer of France, and was a member of the Legislative Assembly in 1849. His most important writings related to Judaism, to the overthrow of Western paganism, and to the institutions of St. Louis, the most extensive work being the *History of the Destruction of Paganism in the West.*

BEURMANN, KARL MORITZ, COUNT VON, a German explorer; born in Potsdam, Germany, July 28, 1835; died in Moa, Africa, in February, 1863. In 1861 he explored the country of the Bogos, in central Africa, and then set out in search of Vogel, who was supposed to have been murdered in Wadai. After many unsuccessful attempts he reached Wadai, where he was murdered by the natives.

BEUST, FREDERICK CONSTANTIN, German geologist and mineralogist; born in Dresden, April 13, 1806; died at Vienna, March 26, 1891. He studied at Freiberg, Leipsic and Göttingen; became superintendent of mines at Freiberg in 1842; in 1867 was appointed inspector-general of mines for Austria. Among other works, he wrote *Critique de la Théorie de Werner sur les Filons,* and *Sur une Loi de la Distribution des Minéraux dans les Filons de Freiberg.*

BEUST, FRIEDERICH FERDINAND, COUNT VON, an Austrian statesman, and one of the most distinguished modern politicians; born in Dresden, Jan. 13, 1809; died in Vienna, Oct. 24, 1886. He represented his government at Munich in 1838, and eight years later he went to London in the same character, whence he was removed to Berlin in 1848; the year following he was called to Dresden, where he received the portfolio of Foreign Affairs, and a few years later he became Minister of the Interior. (See SAXONY, Vol. XXI, p. 356.) When Frederick VII of Denmark died (1863), Beust came forward prominently as the exponent of the German national feeling on the Schleswig-Holstein question. He was always the friend of Austria, and in the crisis of 1866 he supported her, joining in the declaration of war against Prussia, contrary to the wishes of at least the Liberal party in Saxony. When the Six Weeks' War ended, he resigned his office by demand of Prussia, and entering the service of Austria, he rose to the head of affairs. (See AUSTRIA, Vol. III, p. 141.) The chief result of his policy in the reorganization of the empire was the reconciliation of Hungary on the footing of its remaining a separate kingdom.

BEVELAND, NORTH AND SOUTH, two islands in the estuary of the Scheldt, province of Zealand, Holland, separated by a channel on the west from the island of Walcheren. The estimated area is about 120 square miles, with a population of about 23,000. Both islands have suffered severely from inundations, but within recent years much good has been effected by drainage and embankments. South Beveland, the larger of the islands, is very fertile, producing corn, fruit, vegetables, madder, etc., and, in its chief city, Goes, carrying on a brisk trade in corn, hops and fruits. The chief town of North Beveland is Kortgene..

BEVEREN, a town of Belgium, in East Flanders, five miles W. from Antwerp. The principal industry is the making of point lace. Population, 8,000.

BEVERIDGE, JOHN L., general and lawyer; born in New York in 1824; practiced law in Tennessee and Illinois; served in the Civil War, and became brigadier-general of volunteers. Elected lieutenant-governor of Illinois in 1872, he became governor in 1873, when Oglesby was made United States Senator. He afterward received a Federal appointment.

BEVERIDGE, WILLIAM, bishop of St. Asaph; born in Barrow in 1637; died in London, March 5, 1708. He was ordained deacon and priest in 1660, after having obtained the degree of M.A. He refused to accept the bishopric of Bath and Wells when Dr. Thomas Ken was deprived of it for his refusal to take the oaths to the government of William III, and was, in 1704, appointed to that of St.

Asaph. The greater portion of his property was bequeathed to the societies for the Promotion of Christian Knowledge and for the Propagation of the Gospel in Foreign Parts. His writings were published in 12 volumes, at Oxford, in 1842. They are distinguished for profound learning and deep religious tone. His best-known writing, *Private Thoughts on Religion*, was published posthumously.

BEVERLAND, ADRIAN, Dutch classical scholar; born in Zealand about the middle of the seventeenth century; died in England about 1712. His unorthodox writings on original sin and the fall of man caused much excitement in his day, and occasioned his banishment from Utrecht, but are now regarded as mere literary curiosities. His first important pamphlet was *Peccatum Originale*, and the next *De Stolatæ Virginitatis Jure*.

BEVERLOO, a village of Belgium, in the province of Limbourg, 12 miles N.W. of Hesselt. On the extensive heaths surrounding it the Belgian army encamps yearly for exercise. Population, about 1,200.

BEVERLY, a city of Essex County, Massachusetts, in Beverly township, on a bay or inlet of the Atlantic, and on the Boston and Maine (Eastern) railroad, 18 miles N.E. of Boston, 2 miles N.N.E. of Salem, at the junction of the Gloucester branch (Cape Ann). It has a good harbor, fine streets and avenues lighted by gas and electricity, extensive shoe and leather manufactories, steam grain-elevators, machine and wood-working shops, oilcloth and enamel works, etc. It has the New England Institute for the Deaf and Dumb, and a public library of 10,000 volumes. Many of the inhabitants are employed in navigation and the fisheries. Beverly was incorporated in 1668, and has recently become a city. Population 1890, 10,795.

BEVERLY, a town and summer resort of Burlington County, south-central New Jersey, situated on the Delaware River, 15 miles above Philadelphia, and on the Pennsylvania railroad. The principal manufactures are woolens, oilcloth and rope. Population, 1,957.

BEVERLY, a village, the capital of Randolph County, eastern West Virginia, in Tyghart's valley, east of the Rich Mountains, on the West Virginia Central and Pittsburg railroad, 120 miles N.E. of Charleston; has a lumber-mill and academy. Population 1890, 343.

BEVIS OF HAMPTON, the hero of a popular English mediæval romance, edited by Dr. E. Kolbing for the Early English Text Society, in 1885. See ROMANCE, Vol. XX, p. 653.

BEX, a village in the canton of Vaud, southwest Switzerland; situated on the high road to the Simplon, about 26 miles S.E. of Lausanne. It is remarkable for its extensive salt-mines, salt-works, and sulphur baths. The quantity of salt annually produced at Bex is between 2,000 and 3,000 tons. Population, 4,000.

BEY OR BEG, a Turkish title, rather vague in its import, is given to superior military officers, to ship captains, to the sons of pashas, and as an honorary title, to distinguished foreigners. More strictly it applies to the governor of a small district, who bears a horse-tail as a sign of his rank. "Beglerbeg," or more correctly, Beilerbegi (lord of lords), is the title given to the governor of a province who bears three horse-tails as his badge of honor, and has authority over several begs, agas, etc. The rulers of the provinces of Tunis and Tripoli are beys. See TUNIS, Vol. XXIII, p. 62.

BEYERLAND OR BEIJERLAND, an island of South Holland, formed by the junction of the Old Maas with Holland Diep on the one side, the River Spui uniting the Old Maas with the Haringvliet on the other, 6 miles S. of Rotterdam. It is 19 miles long by 10 broad. Its principal town is Old Beyerland. Population, about 4,000.

BEYPUR OR BEYPORE, a seaport of western India, in Malabar district, Madras, situated near the mouth of the Beypur River, six miles S. of Calicut. Iron ore and coal are found in the neighborhood, and iron-works have been established here. Since 1858 Beypur has acquired importance as the terminus of a railway across the peninsula of India from Madras by way of Coimbatore. Population, 7,000.

BEZANT OR BYSANT, properly the *solidus*, a coin of the Byzantine Empire, which had a wide circulation in Europe during the period from about A.D. 800 to the middle of the thirteenth century. The gold bezant varied in value at different periods from $5 to $2.50; the silver one from 50 cents to 25 cents. (See NUMISMATICS, Vol. XVII, p. 654.) In architecture, small round disks ornamenting a molding, and in heraldry "roundels" on a shield, showing descent from a crusader, are termed Bezants.

BEZOAR, a concretion of phosphate of lime found in the stomachs of goats and antelopes, and formerly much valued on account of imaginary medicinal virtues, particularly as an antidote to poisons.

BEZOLD, JOHANN FREDERICK WILLIAM, German meteorologist, born in Munich, Bavaria, June 21, 1837. Educated at Munich and Göttingen, he early evinced an aptitude for the abstruse problems of meteorology, and was called to a professorship at the University of Munich and later called to Berlin to take charge of the German Meteorological Institute, and professor in the University of Berlin. He is one of the recognized authorities in meterology and also in physics. He has published many valuable treatises, among them *Beobachtungen über die Dämmerung* and *Zur Theorie der Cyklonen*, and his *Observations* at the meteorological stations in the kingdoms of Bavaria and Prussia.

BEZZENBERGER, ADELBERT, philologist, born in Cassel, Germany, April 14, 1851; studied at Munich and Göttingen; was assistant professor at Göttingen and became a professor at Königsberg. His published writings include *Lettische Dialektstudien; Über die Sprache der Preussischen Letten;* and *Die Nurische Nehrung und ihre Bewohner*.

BHAGAVAD-GITA (that is, "Revelations from the Deity"), the title of a religious metaphysical poem, interwoven as an episode in the great Indian epic poem of the Mahâbhârata. See SANSKRIT, Vol. XXI, p. 282.

BHAGIRATHI, the name of two rivers of India, one of which is a principal head-stream of the

Ganges (q.v., Vol. X, p. 68), and the other an affluent of the Ganges, and a very important channel of trade, known in its lower course as the Hoogly. On the latter Calcutta is situated.

BHANPOORA, a walled town of Indore, Central India. It is situated on the Rewah, and contains a fort and a palace of the Mahratta ruler, known as the Holkar. Population about, 20,000.

BHARTRIHARI, the name of a celebrated Indian writer of apothegms. Very little is known of his life. A legend makes him the brother of King Vikramâditya, who lived in the first century before Christ, and relates that after a wild, licentious youth he betook himself in later years to an ascetic life. Professor Max Müller fixes the date of his death at A.D. 650. Cheerful descriptions of nature and charming pictures of love alternate in these apothegms, with wise remarks upon the relations of life, and profound thoughts upon the Deity and the immortality of the soul. Bhartrihari was the first Indian author known in Europe. Two hundred of his apothegms were translated in 1653 by Abraham Roger, published under the quaint title, *Open Gates to Hidden Heathenism.* Bohlen published an excellent and successful metrical translation in German (Hamburg) in 1835.

BHAUNAGAR OR BHAUNUGGER, a native state and a city of the Kathiawar Peninsula, western British India. The state occupies that portion of Kathiawar which is washed by the Gulf of Cambay, and has an area of 2,784 square miles and a population of 400,000. The city is a seaport of the Gulf of Cambay, 51 miles S.W. of the city of Cambay, with a population of 57,563.

BHAVANI-KUDAR, a town in the presidency of Madras, in the district of Coimbatore, 58 miles from the city of that name, at the confluence of the Bhavani and the Cavery rivers. It is the location of two noted temples of Vishnu and Siva.

BHOOJ OR BHUJ, the capital of Cutch. See CUTCH, Vol. VI, pp. 730, 731.

BHOWAN, BHOWANJ, BHEWANNEE OR BHAWANI, a town in the district of Hissar, in the southern part of the Punjab, British India. Population, about 33,000. See HISSAR, Vol. XII, p. 2.

BHUJI OR BIJI, a small hill state in the Punjab, India, extending along the left bank of the Sutlej, between this river and the Jumna, for about 20 miles. Its greatest breadth is about 7 miles. Population, about 10,000.

BHUTAN, BOOTAN OR BHOTAN, an independent state in the easten Himalayas, on the northeast of Thibet. Area, 16,800 square miles. Population, 35,000. Capital, Punahka. For early history, see BHUTAN, Vol. III, p. 631.

Since 1865 the Indian government bestows on the Bhutan rulers an annual subsidy of fifty thousand rupees, and in return is permitted to hold two strong fortresses (Buxa and Dewangiri) as a protection from warlike incursions. The state is 160 miles in extreme length east and west and 90 miles in extreme breadth.

The government of Bhutan resembles that of Thibet, the chief authority being nominally divided between the *deb raja* or secular head, on the one hand, and the *dharma raja* or spiritual head of the state on the other. Practically, the *deb raja* is a mere instrument in the hands of powerful barons or *penlops.* The *dharma raja* is supposed to be the incarnation of his predecessor, and is chosen in infancy. The chief towns of Bhutan are Punakha, the capital, a place of great natural strength; Tashichhu Jong, Paro, Angdaphorang, Togsa, Taka and Biaka.

The people are nominally Buddhists. Tashichhu Jong, the chief monastery in Bhutan, contains 300 priests.

The chief productions of Bhutan are rice, Indian corn, millet, two kinds of cloth, musk, ponies, chowries and silk. Muzzle-loading guns and swords of highly-tempered steel are manufactured.

The trade between British India and Bhutan amounted in 1894–95 to 15,770 rupees imports from and 16,655 rupees exports to India. The chief imports are tobacco, European cotton goods, betelnuts and rice; the chief exports, wool, musk, ponies, and caoutchouc.

BIALYSTOK. See BIELASTOK, Vol. III, p. 668.

BIANCAVILLA, a town of eastern Sicily, 14 miles N.W. of Catania, and 10 miles S.W. of Mount Ætna, with a trade in grain, cotton and silk. It is on the site of the ancient Inessa. Population, about 13,000.

BIANCHI, BARTHELEMY URBAIN, French inventor; born in Montpellier, Dec. 25, 1821; studied at Toulouse; after five years of study he entered the workshops at Gambey as a student. He learned there the detailed construction of instruments relative to all branches of physics. He began work for himself in 1840. He has constructed a great many instruments of his own invention, chief among them being the Bianchi air-pump; for a description of which see PNEUMATICS, Vol. XIX, p. 246.

BIANCONI, CHARLES, an Italian, inventor of the Irish car system; born in the duchy of Milan in 1786; went at the beginning of the century to Ireland as an itinerant vendor of cheap prints. He accumulated a small capital and recognizing the need of public conveyances in Ireland, he started the first car between Clonmel and Cahir in 1815, at a time when peace and the carriage-tax had filled the market with cheap horses and jaunting-cars. The enterprise proving a success, the system was extended, until, 40 years later, Bianconi's cars were working over 4,000 miles of road daily. Having realized a large fortune, he retired in 1865, and died in September, 1875, at his estate near Cashel.

BIART, AUGUSTE FRANÇOIS, a French painter; born at Lyons, Oct. 20, 1798; died June 20, 1882, at Platreries. He was at first destined for the church, but was educated at the school of art in his native city. He is distinguished for his animated and often comical representation of ordinary life and manners, but is known in almost every department of his art. *The Babes in the Wood, The Fortune-Teller,* and *Clearing for Action,* are the best known of his works.

BIART, LUCIEN, French author; born at Versailles, June 21, 1829; traveled in America for three years, where he obtained a large collection of insects and birds for the Paris Museum of Natural History;

was made a doctor of medicine by the Academy at Puebla; became a member of a commission to Mexico, where he was decorated with the order of Guadeloupe by Maximilian. Upon his return to France after an absence of five years, he published a series of descriptions of his travels and of customs in America. The greater part of these writings were published in the *Revue des Deux Mondes*. He has also written several books of poetry, including *Present and Past* and *The Mexicans*.

BIB, a food-fish, allied to the cod. See POUT, Vol. XIX, p. 650.

BIBAUD, FRANÇOIS MARIE, author and professor of law in the Montreal Jesuit College; born in Montreal, November, 1824; is a son of Michel Bibaud (q.v., below). His writings are mainly historical, and include *A History of the American Savages; History of the Material and Intellectual Progress of Canada;* and a *Historical Dictionary of Famous Men of Canada and America.*

BIBAUD, MICHEL, Canadian historian; born near Montreal, Jan. 20, 1782; died in Montreal, Aug. 3, 1857. He wrote a number of histories of French Canada, all in the French language. His published writings include *The Canadian Library* (5 vols.); a *Canadian Encyclopædia;* and a *History of Canada under French Rule.*

BIBB, GEORGE M., jurist and statesman; born in 1772, in Virginia; died in Georgetown, District of Columbia, April 14, 1859. He was graduated in 1792 from Princeton; removed to Kentucky; became a prominent lawyer; member of the legislature; three times elected chief justice and afterward chancellor of Kentucky; from 1811 to 1814, and again from 1829 to 1835, United States Senator from Kentucky; during Tyler's administration was Secretary of the Treasury. He edited several volumes of Kentucky law reports.

BIBER, GEORGE EDWARD, English clergyman; born in Ludwigsburg, Germany, Sept. 4, 1801; died at West Allington, England, Jan. 19, 1874. He is the author of several pedagogical writings in conjunction with Pestalozzi; became a rector in the Church of England and a prominent controversialist. Among his later writings are *The Supremacy Question* and *On the Unity of the Church*, a translation from the Latin of a correspondence between himself and Dr. Michaelis.

BIBERICH OR BIEBRICH, a village in the duchy of Nassau, Germany; on the right bank of the Rhine, about four miles south from Wiesbaden. It is noted for its splendid palace. The views of the river scenery from Biberich are unrivaled. Population, including Mosbach, about 11,000.

BIBLE CHRISTIANS, a sect. (See METHODISM, Vol. XVI, p. 192.) In the United States they are limited to a few congregations, scattered in parts of Ohio and Wisconsin, and forming a part of the Canadian Conference.

BIBLE CIRCULATION. (For the general discussion of questions relating to the Bible and its circulation by various organizations to the year 1875, see BIBLE, Vol. III, pp. 634–650.) The annual report of the British and Foreign Bible Society for the year ending March 31, 1895, showed a total issue for that year by that society of 3,837,222 copies of the Holy Scriptures. The great increase of the work of the British and Foreign Bible Society during the last few years may be seen by the following tabular statement of its total issues by decades:

| | | | | |
|---|---|---|---|---|
| Total issues to March 31, 1820 | | | | 2,843.291 |
| For ten years to March 31, | | | 1830 | 3.710,507 |
| " | " | " | 1840 | 5,768.673 |
| " | " | " | 1850 | 10,787.579 |
| " | " | " | 1860 | 14,417.778 |
| " | " | " | 1870 | 21,868.843 |
| " | " | " | 1880 | 28.771.748 |
| " | " | " | 1890 | 35.760.627 |
| For March 31, 1890, to Jan. 1, 1891 | | | | 19.467,184 |
| Grand total from organization to Jan. 1, 1895 | | | | 143,396,230 |

The receipts for the year ending March 31, 1895, aggregated $1,166,815; total expenditures for the year, $1,074,850.

The American Bible Society issued during the year ending March 31, 1896, an aggregate number of 1,750,283 copies,—an increase over the preceding year of 169,155. Its total issues from 1816, the date of its organization, to March 31, 1896, aggregated 61,705,841. The cash receipts for the year aggregated $437,223.

The number of issues of the two societies (British and Foreign and American Bible societies) during 1895 aggregated 5,418,350 copies, *an average of about 17,366 copies of the Scriptures for every working-day of the year.* (For a full list of the parent Bible societies, with the latest total number of issues reported by each, see BIBLE SOCIETY, in these Supplements.) The grand total of issues to Jan. 1, 1896, circulated by all the societies, was 256,647,008.

In not a few cases no written language or dialect was found, and the missionary teacher was required to give the people first a language and then the translation of the Bible into it.

The following are specimens of the languages and dialects into which the Bible, or portions of it, had been translated and printed up to the year 1890. The number of languages into which the Bible, or portions of it, were translated, printed and circulated, directly or indirectly, by the British and Foreign Bible Society and the American Bible Society to that date, was 291. After making due allowance for repetitions, the specimens here given represent 213 languages and dialects. They are arranged very nearly according to the countries in which they originated. The reader begins with the languages of the British Isles, 1 to 6, and proceeds to the continent of Europe, 7 to 68. The languages of Asia come next, 69 to 162; then the islands, 163 to 185; then those of Africa, 186 to 217; and finally, those which are peculiar to the American continent, 218 to 242.

In some cases, as will be noticed, the specimen is repeated to show the different alphabets or characters which the people use. The Turkish version, for example, is prepared for Moslems in the Arabic letter; but for Armenians an entirely different form is needed, and for Greeks yet another. Except where otherwise indicated, the Scripture verse here given is that of John iii, 16.

**1. ENGLISH.**

For God so loved the world, that he gave his only begotten Son, that whosoever believeth in him should not perish, but have everlasting life.

**2. GAELIC.** *(Highlands of Scotland.)*

Oir is ann mar sin a ghràdhaich Dia an saoghal, gu'n d'thug e 'aon-ghin Mhic féin, chum as ge b'e neach a chreideas ann, nach sgriosar e, ach gu'm bi a'bheatha shiorruidh aige.

**3. IRISH.**

Óſn ıꞇ man ro do ȝnáðṁ,ȝ Oſa an ðóṁan, ȝo bcuȝ ré a éinȝein Mhcıc [ſéiṇ], ionnur ȝlð bé ċneıdeaꞇ aṇ nać naċað ré a máȝa, acd ȝo mbeıċ an bheaṫa shiorruidhe aige.

**4. IRISH** *(Roman).*

Oír is mar so do ghrádhuigh Día an domhan, go dtug sé a éinghein Meic fein, ionnus gidh bé chreideas ann, nach rachadh sé à mugha, achd go mbeith an bheatha shiorruidhe aige.

**5. MANX.** *(Isle of Man)*

Son lheid y ghraih shen hug Jee da'n theihil, dy dug eh e ynrycan Vac v'er ny gheddyn, nagh jinnagh quoi-erbee chredjagh aynsyu cherraghtyn, agh yn vea ta dy bragh farraghtyn y chosney.

**6. WELSH.**

Canys felly y carodd Duw y byd, fel y rhoddodd efe ei unig-anedig Fab, fel na choller pwy bynnag a gredo ynddo ef, ond caffael o hono fywyd tragywyddol.

**7. BRETON.** *(Brittany.)*

Rag evel-se eo en deus Doue caret ar bed, ma en deus roed e Vab unik-ganet, evit na vezo ket collet ploubenag a gred ennau, mes ma en devezo ar vuez eternel.

**8. FRENCH.**

Car Dieu a tellement aimé le monde, qu'il a donné son Fils unique, afin que quiconque croit en lui ne périsse point, mais qu'il ait la vie éternelle.

**9. FRENCH BASQUE.** *(Pyrenees.)*

Jaincoac ecen hain maite içan du mundua, non eman baitu bere Seme bakharra, amoren gatic norcere sinhesten baitu hura baithan gal ez dadin, bainan çan deçan bethiereco bicia.

**10. SPANISH.**

Porque de tal manera amó Dios al mundo, que haya dado á su Hijo unigénito; para que todo aquel que en él creyere, no se pierda, mas tenga vida eterna.

**11. CATALAN.** *(Eastern Spain.)*

Puix Deu ha amat de tal modo al mon, que ha donat son unigenit Fill, á fi de que tot hom que creu en ell no peresca, ans be tinga la vida eterna.

**12. SPANISH BASQUE.**

Alchatuco naiz, eta juango naiz nere aitagana, eta esango diot: Aita, pecatu eguin nuen ceruaren contra, eta zure aurrean.—(*Luke* xv. 18.)

**13. SPANISH BASQUE.** (Guipuscoan Dialect).

Joaten ceratela bada eman zayozcatzute eracutsiac jende gucial: batayatzen dituzutela Aitaren, eta Semearen, eta Espiritu santuaren icenean.—(*Matt.* xxviii. 19.)

**14. GITANO.** *(Spanish Gipsies.)*

Mangue ardiñelaré, y chalaré al batusch, y le penaré: Batu, he querdi crejete contra o Tarpe y anglal de tucue.—(*Luke* xv. 18.)

**15. PORTUQUESE.**

Porque de tal maneira amou Deos ao mundo, que deo a seu Filho unigenito; para que todo aquelle que nelle crê, não pereça, mas tenha a vida eterna.

**16. ICELANDIC.**

Því svo elskaði Guð heimiun, að hann gaf sinn eingetinn Son, til þess að hver, sem á hann trúir, ekki glatist, heldur hafi eilift lif.

**17. NORWEGIAN.**

Thi saa haver Gud elſket Verden, at han haver givet ſin Søn den eenbaarne, paa det at hver den, ſom troer paa ham, ikke ſkal fortabes, men have et evigt Liv.

**18. SWEDISH.**

Ty så älſkade Gud werldena, att han utgaf ſin enda Son, på det att hwar och en, ſom tror på honom, ſkall icke förgås, utan få ewinnerligit lif.

**19. NORWAY-LAPPONESE** (or Quanian).

Dastgo nuft rakkasen ani Ibmel mailme, atte barnes sân addi, dam aino, amas juokkaš, gutte su ala åssko, lapput, mutto vai agalaš sællem sân åžuši.

**20. LAPPONESE.**

Jutte nân etſi Jubmel wálaldeb, atte ſobn uſkoſwabbi ainarâgatum Wardnebš, wai ſart tutte, jukko jakka ſo nat, i kaikka lappoi ainat âbtjot efewen eiemeb.

**21. RUSS LAPP.**

Тэн гудйк што Иннель нит шабэшій тан альме, што нджес Альге, эхтушэнтма эндій, тэн варас што юкьянъ, Кіе Сонне віер, ій майкьяхъ, а лехъ сонне агеealмуш.

**22. FINNISH.**

Sillä niin on Jumala mailmaa rakaſtanut, että hän anboi hänen ainoan Poikanſa, että jokainen kuin uſkoo hänen päällenſä, ei pitä hukkuman, mutta ijankaikkiſen elämän ſaaman.

**23. DUTCH.**

Want alzoo lief heeft God de wereld gehad, dat hij zijnen eeniggeboren' Zoon gegeven heeft, opdat een iegelijk, die in hem gelooft, niet verderve, maar het eeuwige leven hebbe.

**24. FLEMISH.**

Want alzoo lief heeft God de wereld gehad, dat hij zijnen eeniggeboren Zoon gaf; opdat allen, die in hem gelooven, niet verloren worden, maar het eeuwige leven hebben.

**25. GERMAN.**

Alſo hat GOtt die Welt geliebet, daß er ſeinen eingebornen Sohn gab, auf daß Alle, die an ihn glauben, nicht verloren werden, ſondern das ewige Leben haben.

**26. GERMAN** (*Hebrew*).

דען אלזא האט גאטט דיא וועלט געליעבעט, דאס ער זיינען איינגעבאהרנען זאהן גאב, אויף דאס אללע, דיא אין איהן גלויבען, ניכט פערלאהרען ווערדען, זאנדערן דאס עווינע לעבען האבען.

**27. LITHUANIAN.**

Taipo Diewś mylėjo swietą, kad sawo wienginmusį sunu dūwe, jeib wissi i ji tikti ne prapultu, bet amżiną gywmatą turrėtu.

**28. POLISH.**

Albowiem tak Bóg umiłował świat, że Syna swego iednorodzonego dał, aby każdy, kto weń wierzy, nie zginął, ale miał żywot wieczny.

**29. POLISH** (*Hebrew*).

וְיאַרין נָאט הָאט דיא וועלט אזוֹ גִילִיבְּט, דָאש עֶר הָאט גִיגֶעבִּין זַיין אַיינְצִיגְן זוהן, אַז אִיטְלִיכֶר וואש גְלַייבְּט אָן אִירם זָאל נִיט פַֿר־לוֹרִין ווערין, נִיישָׁם עֶר זָאל הָאבִּין דָאש אִיבִּיגִי לעבִּין:

**30. WENDISH** (Upper). (*Lusatia.*)

Pśchetoj tak je Boh ton Sdwjet lubował, so won swojeho jenicžkeho narodženeho Sdyna dał je, so bychu schitzy, kij do njeho wjerja, shubeni nebyli, ale wjecżne żiwenje mjeli.

**31. WENDISH** (Lower). (*Lusatia.*)

Pścheto tak jo Bohg ten swjet lubował, aj won swojogo jadnoporojonego syna dał jo, abu schykne bo nogo wéreże, sgubone nebyli, ale to ńimerne żiwenie méli.

**32. BOHEMIAN.**

Nebo tak Bůh miloval svět, že Syna svého jednorozeného dal, aby každý, kdož wěří w něho, nezahynul, ale měl żiwot wěčný.

**33. HUNGARIAN.**

Mert úgy szerete Isten e' világot, hogy az ő egyetlenegy szülött Fiját adná, hogy minden, valaki hiszen ő benne, el ne vesszen, hanem ör k életet vegyen.

**34. HUNGARIAN-WENDISH.** (*Wends in Hungary.*)

Ar je tak lübo Bôg ete szvêt, da je Szinâ szvojega jedinorodjenoga dáo, dá vszáki, kí vu nyem verje, sze ne szkvari, nego má 'zítek vekivecsni.

**35. SLOVENIAN.**

Kajti tako je Bog ljubil svet, da je sina svojega edinorojenega dal, da kdorkoli veruje va-nj, ne pogine, nego da ima večno żivljenje.

**36. LATIN.**

Sic enim Deus dilexit mundum, ut Filium suum unigenitum daret, ut omnis qui credit in eum non pereat, sed habeat vitam eternam.

**37. ITALIAN.**

Perciocchè Iddio ha tanto amato il mondo, ch'egli ha dato il suo unigenito Figliuolo, acciocchè chiunque crede in lui non perisca, ma abbia vita eterna.

**38. ROMANESE** (Oberland). (*Switzerland.*)

Parchei Deus ha teniu il mund aschi car, ca el ha dau siu parsulnaschiu figl, par ca scadin, ca crei en el, vomi buc á perder, mo hagi la vita perpetna.

**39. ROMANESE** (Enghadine). (*Switzerland.*)

Perche chia Deis ha taunt amâ 'l muond, ch'el ha dat seis unigenit Filg, aciò chia scodün chi craja in el nun giaja ù perder, mo haja vita eterna.

**40. PIEDMONTESE.**

Pĕrché Iddiou a l ha voulsù tantou ben al mound, ch'a l ha dait so Fieul unic, pĕr chĕ chiounque a i prĕsta fede a perissa nen, ma ch'a l abbia la vita eterna.

**41. VAUDOIS.** (*Waldenses, N. Italy.*)

Perqué Diou ha tant vourgù bén ar mount, qu'a l ha dounâ so Fill unic, perque quiounqué crê en el perissé pâ, mà qu'a l abbia la vita éternella.

**42. MALTESE.**

Ghaliex Alla hecca hab id dinia illi tâ l'Iben tighu unigenitu, sabiex collmin jemmen bih ma jintilifx, izda icollu il haja ta dejem.

**43. GREEK** (Ancient).

*Οὕτω γὰρ ἠγάπησεν ὁ Θεὸς τὸν κόσμον, ὥστε τὸν υἱὸν αὐτοῦ τὸν μονογενῆ ἔδωκεν, ἵνα πᾶς ὁ πιστεύων εἰς αὐτὸν μὴ ἀπόληται, ἀλλ' ἔχῃ ζωὴν αἰώνιον.*

**44. GREEK** (Modern).

*Διότι τόσον ἠγάπησεν ὁ Θεὸς τὸν κόσμον, ὥστε ἔδωκε τὸν Υἱὸν αὐτοῦ τὸν μονογενῆ, διὰ νὰ μὴ ἀπολεσθῇ πᾶς ὁ πιστεύων εἰς αὐτὸν, ἀλλὰ νὰ ἔχῃ ζωὴν αἰώνιον.*

**45. GREEK** (Modern) (*Roman*).

Sicothis thelo ipaghi pros ton patera mu, ke thelo ipi pros afton, Pater, imarton is ton uranon ke enopion su.—(*Luke* xv. 18.)

**46. ALBANIAN** (Gheg).

Sepeš Perendia kaki e dešti botęno, aš ša Birin' e vet, vetęm-l'ěminę, pęr mos me uvdierę gięę-kuś t'i besoyę, por te ketę yetę tę paěšęme.

**47. ALBANIAN** (Tosk).

*Σὲ ψὲ Περντία κάκε ὲ δέϑι ἠότεν̱ε, σὰ ἐὲ δὰ τὲ πίρῤ ἐτὶγ τὲ βέτεμινε, ἐὲ τζίλι δὸ ἐὲ τὲ ἠεσόγε̱ ντὲ ἀἰ τὲ μὸς χουμπάσε, ἠὸ τὲ κέτε γέτεν' ὲ ἠὰ σόσουρε.*

**48. TURKISH** (*Arabic*).

زيرا الله دنيائى بو قدر سودى كه
كندى ابن وحيدينى ويردى تا كه آكا
هر ايمان ايدن هلاك اولميوب ابجق حيات
ابديه يه مالك اوله.

**49. TURKISH** (*Greek*).

*Ζίρα Ἀλλὰχ τϑνγιαγιὴ ἠοὶ καὶὰρ αεβτί κι, κεντὶ ἠιριτζὶκ Ὀγλουνοὺ βερτὶ, τάκι χὲρ ὀνὰ ἰνανὰν, ζάῖ ὅλμαγια, ἴλλα ἐἠέτι χαῖατὰ μαλὶκ ὀλά.*

50. TURKISH (*Armenian*).

Ովքեր Աստուծոյ սիրելեաց գաւառը սեղմէ չի քննուի իսկ ի վերնոյն վերոյ, քան զի սիրտ հեր իմն հասել հեղոյ օրհնուցիչ, սիրելոյ հայոյի ը հպետիչի մարդ օրս։

51. SPANISH (*Hebrew*). (*Spanish Jews in Turkey.*)

כורקי לכמי לומן ליל לה ליל מונדו לסטה דלר
לה סו לינו רינגלדו כילרה קי טודו ליל קי קריסי
לין ליל נו סי דיכיירה סינו קי טינגה נידם די
סיימכרי.

52. ROUMAN (*Roman*). (*Danubian Prov.*)

Caci aşa a iubit Dumnedeu lumea, încat a dat pre Fiiul seu cel unul-nascut, ca tot cel ce crede în el sî nu se pierdę, ci sî aiba vieţa eterna.

53. ROUMAN (*Cyrll character*).

Кaчl аша а іюбіт Dумнезеў лумea, кѣ а дат пе Фііюл сеў чел унулнскут, ка тот чел че крede дa ел сѣ нu пеарe, чі сѣ аібѣ віеацъ вечнікъ.

54. RUTHENIAN. (*Little Russia.*)

Ѣставши исїдѧ до ѻтцâ моїего, і зкажѳ їемѳ: Отче, згрішив їем протів неба і перед тебо̀.—(*Luke* xv. 18.)

55. SERVIAN.

Јер Богу тако омиље свијет да је и сина својега јединороднога дао, да ни један који га вјерује не погине, него да има живот вјечни.

56. CROATIAN.

Jer Bogu tako omilje svijet da je i sina svojega jedinorodnoga dao, da ni jedan koji ga vjeruje ne pogine, nego da ima život vječni.

57. BULGARIAN.

Защото Богъ толкозь възлюби свѣтъ-тъ, щото даде Сына своего единородна-го, за да не погыне всякой който вѣру-ва въ него, но да има животъ вѣченъ.

58. SLAVONIC.

Та́кѡ бо возлюбѝ Бг҃ъ мі́ръ, ꙗ̀кѡ и҆ Сн҃а своего̀ є҆диноро́днаго да́лъ є́сть, да всѧ́къ вѣ́рꙋѧй въ С҃нь, не поги́-нетъ, но и҃мать живо́тъ вѣ́чный.

59. RUSSIAN.

Ибо такъ возлюбилъ Богъ міръ, что отдалъ Сына своего единороднаго, дабы всякій, вѣрующій въ Него, не погибъ, но имѣлъ жизнь вѣчную.

60. ESTHONIAN (Reval). (*Russia.*)

Seſt nenda on Jummal ma-ilma armaſtanud, et temma omma ainо ſündinud Poia on annud, et üffi, ſes temma ſiſſe uſſub, ei pea hukka ſama, waib, et iggawenne ello temmal peab ollema.

61. ESTHONIAN (Dorpat).

Seſt nida om Jummal ſedda ilma armaſtanu, et temma omma ainо ſündinu Poiga om andnu, et kik, kes temma ſeſe uſkwa, hukka ei ſa, enge iggaweſt ello ſawa.

62. LETTISH. (*Livonia.*)

Un tik lohti Deews to paſauli mihlejis, ka winſch ſawu paſchu wennpeedſimuſchu Dehlu irr dewis, ka wiſſeem teem, kas tizz eekſch winna ne buhs paſuſtees, bet to muhſchigu dſihwoſchanu dabbuht.

63. KARELIAN. (*Finland.*)

Нiйит ана валгуӧвъ шiйнъ валгiё инегизiёнъ iёшшя, ю̂ ана пяхшяйсь шiйнъ гювяшъ азiёшъ: и кiйшѣшшяйсь шiйнъ Туйшшуӧ, кумбане онъ шайвага-шша.—(*Matt.* v. 16.)

64. ZIRIAN, or Siryenian. (*Finns about Vologda.*)

Сыдзи медъ югъалась тiянъ югы-дъ мортъась водзинъ, медъ адзасны тiянлысь кѳръ керӧмъась, и ошка-сны Катесъ тiянлысь, коды небе-сась выльнъ.—(*Matt.* v. 16.)

65. SAMOGITIAN. (*Wilna.*)

Nesa taipo Diewas numilėjo ſwieta, jog Sunu ſawo wiengimuſi dáwe: idánt kiekwienas, kurs ing ji tik, ne prajutu, bet turétu amżina giwáta.

66. MORDVIN.

Се́ксъ исшя́ ве́чкизе Па́зъ масшо́ронь ѳ́рицяшъ, мя́кѣсъ на́ксызе цю̀ранзо сонзе́ ска́монъ ша́чшуманъ, шшо́бы эрьва́ ке́миця ла́нгозонзо авбль ю̀ма, но у́левель пи́-гень эря́носо.

67. TCHEREMISSIAN. (*Finns on the Volga.*)

Теньгѐ ярашэ́нъ Ю̀ма санда́ликамъ, шша̀ и́къ шкѐ ѳ́ргажамъ пу́шъ, са́кай иняньша шы́даланъ и́нже-я́мъ, а и́лежe варà мучáшдэма ку́румъ му́чка.

68. TCHUWASH. (*Volga.*)

Сяплà iо́ра́дре То́ра Эдемя, што барзà ху у́выле пе́рь сю́ра́дпыне, штобы порь иняпягтя́нь онà апъ пю̀дтаръ, а ѳсра́даръ iумюрьгѝ бу́рназя.

**69. WOTJAK.** *(W. Siberia.)*

Озӥ недъ пиштӧзъ югытъ-ты тилӥдъ адямиӥосъазинъ, собосъ недъ адзиӧзы дзӟць уждэсъ тилӥдъ, сӥ-но нӟдъ сиӧтозы Аилы, кудызъ инъ выльнъ.—(*Matt.* v. 16.)

**70. WOQUL.** *(Ural Mountains.)*

Ти-саувт Тӧрин ӟрептистӓ мерма сто еле-мистӓ ӓкутӟлим пувта, исто сокинкар, кон агтта тӓве, ат пи колни, а инра лилма контитӓ.

**71. ORENBURG, or Kirghise Tartar.**

زيرا كه خدا جهانى اول قدر سودى كه بر دوشش اوغلين ويردى
كه هركيم آنكا ايشانسا هلاى اولسا لكن ابدى حياتى بولسا.

**72. OSSETINIAN.** *(Caucasus.*

Цæппӕрӕдтæр Хуыдӕй адӕмы бӕлвырд дӕр кодта, цӕмӕй Йӕ ӕнӕмӕнгӕйрӕ Фӕрӕзӕлæр рацӕттӕ ӕмбӕлой, ӕмӕ ӕй ӕнӕ фесӕфой, фӕлӕ ӕм ӕз ӕнӕсон цӕрӕн.

**73. HEBREW.**

כי כה אהב אלהים את־העולם כי־נתן את־
בנו היחיד׃ למען כל־המאמין בו לא יאבד׃
כי אם־חיי עולם יהיו לו׃

**74. ARMENIAN (Ancient).**

Զի այնպէս սիրեաց Աստուած զաշխարհս՝ մինչև զմիածին իւր միածին ետու. զի ամենայն որ հաւատայ ՚ի նա՝ մի՛ կորիցէ, այլ ընկալցի զկեանսն յաւիտենականս.

**75. ARMENIAN (Modern).**

Ինչու որ Աստուած անանկ սիրեց աշխարհը մինչև որ իր միածին Որդին տուաւ. որ ամէն ով որ անոր հաւատայ՝ չկորսուի, հապա յաւիտենական կեանք ունենայ:

**76. ARMENIAN (Ararat).**

Պատճառն որ՝ Աստուած էնպէս սիրեց աշխարհքին՝ մինչև որ իրան միածին Որդին տուաւ. որ ամէն ով որ հաւատայ նորան՝ չկորչի, այլ յաւիտենական կեանքը ընդունի:

**77. GEORGIAN.**

რამეთუ ესრეთ შეიყუარა ღმერთმან სო-ფელი ესე, ვითარმედ მიცა თჳსი მხო-ლოდ შო-ბილი მი-ჴსცა მას, რათა ყო-ველსა რი-მელსა ჰრწმენეს იგი არა წარჴსწყდეს, არამედ აქუნდეს ცხო-ვრებაჲ სათუკუნო.

**78. KOORDISH.**

*Զրմա քо խоսէ վուսան հուպանտ տրնէ, հաթա քо եէքզա Գուէ խо տա, ՎԸր հէր քի քо ժէռա իման պինա վուսնտա նա պա, լէ ժը էպէտի հայաթտա մալիք պըպա.*

**79. AZERBIJAN.**

چونکه الله دنیانی بو قدر سودی که اوزیکانه اوغلنی ویردی تا که اونه هر ایمان کتورن هلاك اولیه اما ابدی حیاته مالك اوله.

**80. TURKISH TARTAR, or Karass.** *(Astrakhan.)*

زيرا الله دنيايى شويله سويدكه كندو بر يكانه اوغلين ويردى تا كه هركيم آكا اينانورسه هلاك اولميه اما ابدى ديرلكى اوله.

**81. ARABIC.**

لِأَنَّهُ هٰكَذَا أَحَبَّ ٱللهُ ٱلْعَالَمَ حَتَّى بَذَلَ ٱبْنَهُ ٱلْوَحِيدَ لِكَيْ لَا يَهْلِكَ كُلُّ مَنْ يُؤْمِنُ بِهِ بَلْ تَكُونُ لَهُ ٱلْحَيٰوةُ ٱلْأَبَدِيَّةُ.

**82. ARABIC** *(Hebrew).* *(Jews in Syria, Yemen, &c.)*

פאנה הכדא יהב אללה אלעאלם חתי בדל אבנה אלוחיד לכילא יהלך כל מן יומן בה בל יכון לה חיאה אלאבד׃

**83. ARABIC** (Carshun). *(Mesopotamia, &c.)*

هكذا احب الله العالم حتى
بذل ابنه الوحيد لكيلا يهلك
كل من يومن به بل يكون
له الحيوة الابدية.

**84. SYRIAC (Ancient).**

ܡܛܠ ܕܗܟܢܐ ܐܠܗܐ ܠܥܠܡܐ ܗܘ ܕܝܗܒ ܒܪܗ ܝܚܝܕܝܐ ܕܟܠ ܡܢ ܕܡܗܝܡܢ ܒܗ ܠܐ ܢܐܒܕ ܐܠܐ ܢܗܘܐ ܠܗ ܚܝܐ ܕܠܥܠܡ ܥܠܡܝܢ.

**85. SYRIAC (Modern).**

ܡܛܠ ܗܟܢ ܚܒ ܐܠܗܐ ܠܥܠܡܐ ܕܝܗܒ ܒܪܗ ܝܚܝܕܝܐ ܕܟܠ ܡܢ ܕܡܗܝܡܢ ܒܗ ܠܐ ܢܐܒܕ ܐܠܐ ܢܗܘܐ ܠܗ ܚܝܐ ܕܠܥܠܡ ܥܠܡܝܢ.

**86. PERSIAN.**

زیرا که خدا آنقدر جهان را دوست داشت
که فرزند یگانهٔ خودرا ارزانی فرمود تا که
هر کس که بر او ایمان آورد هلاک نشود
بلکه زندهگانی جاوید یابد

**87. PERSIAN (*Hebrew*). (*Jews in Persia.*)**

זיראי כה כדאי אן קדר נהאן ראי דוסת דאשת
כה פרזנד יכאנה' כוד ראי ארזאני פרמוד כה
הא הר כס כה בר או אימאן אורד הלאך
נשוד בלכה זנדגאני נאויד יאבד:

**88. PUSHTOO, or Afghan.**

خلړه چه خداي دنيالړه دارنګ مينه کړي
ده چه هغه خپل يوه پيدا شوي زوي لړه
ورکړه چه هر يوسړي چه يهغه باند يقين
کوي هغه دهلاک نشي ليکن بې نهايته
ژوندون دموي .

**89. SANSKRIT.**

ईश्वर इत्थं जगदद्दयत यत् स्वमद्वितीयं तनयं प्रादद्दात् यतो यः कश्चित् तस्मिन् विश्वसिष्यति सोऽविनाश्यः सन् अनन्तायुः प्राप्स्यति ।

**90. URDU, or Hindustani (*Arabic*).**

کیونکہ خدا نے دنیا کو ایسا پیار کیا ہی کہ
اُسنے اپنا اکلوتا بیٹا دے دیا تاکہ جو کوئی
اُسپر ایمان لاوے ہلاک نہ ہووے بلکہ
حیات ابدی پاوے .

**91. URDU (*Persian*).**

کیونکہ خدا نے جہان کو ایسا پیار کیا ہی کہ اُسنے
اپنا اکلوتا بیٹا بخشا تاکہ جو کوئی اُسپر ایمان لاوے
ہلاک نہووے بلکہ ہمیشہ کی زندگی پاوے

**92. URDU (*Roman*).**

Kyúnki Ḳhudá ne jahán ko aisá piyár kiyá hai, ki us ne apná iklautá Beṭá baḳhshá, táki jo koí us par ímán láwe, halák na howe balki hamesha kí zindagí páwe.

**93. BENGALI.**

কেননা ঈশ্বর জগতের প্রতি এমত প্রেম করিলেন, যে আপনার অদ্বিতীয় পুত্রকে দান করিলেন; যেন তাঁহাতে বিশ্বাসকারি প্রত্যেক জন বিনষ্ট না হইয়া অনন্ত জীবন পায়।

**94. BENGALI (*Roman*).**

Kenaná Iśhwar jagater prati eman dayá karilen, je ápanár adwitíya Putrake pradán karilen; táháte táṅhár bishwáskári pratyek jan nashṭa ná haiyá ananta paramáyu páibe.

**95. MUSSULMAN-BENGALI.**

কেননা খোদা দুনিয়ার তরফে এমনা মেহের করিলেন, যে তিনি আপনার একলৌতা বেটাকে বকশিশ করিলেন, তাহাতে যে কোন শক্স তাহার উপরে ইমান আনে সে হালাক না হইয়া বহুত হামেশার জেন্দেগি পাইতে পারে।

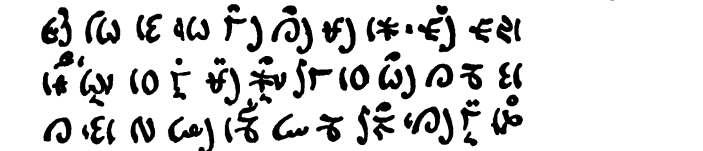
**96. SANTALI. (*Bengal.*)**

Nonká báre ápe hoṇ horko samángre marsál gnel ochoitápo jemon unko hoṇ ápeá: bugi kámi gnelkáte áperen sormáren jaːnámi: ko sarhaue.—(*Matt.* v. 16.)

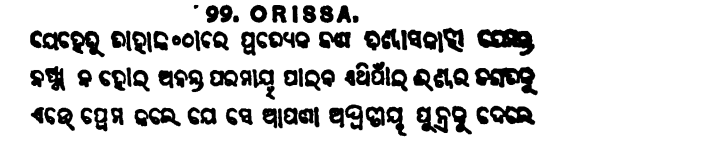
**97. MONDARI. (*Koles of Chota Nagpore.*)**

किअपि परमेश्वर नेगे होका बेनाहन होड़ो इलागे चाँहा हागा जोड़ो मिसी जोड़ो चाँहा हंगा मेनेया ॥ (*Mark* iii. 35.)

**98. LEPCHA.**



**99. ORISSA.**



**100. HINDI, or Hindui.**

क्योंकि ईश्वरने जगतको ऐसा प्यार किया कि उसने अपना एकलोता पुत्र दिया कि जो कोई उसपर विश्वास करे सो नाश न होय परन्तु अनन्त जीवन पावे।

**101. HINDI (*Kaithi*).**

कइोंकी इसर नें जगत पर ऐसो पयीर की, की उसने अपना ऐकलोता पुसर दीया की जो कोइ उस पर बीसवास लावे सो नास न होवे परंतु अनंत जीवन पावे।

**102. SINDHI** *(Arabic). (Western India.)*

چا کان ڌ خداءِ جهان کي اِهڙو پيارو رکيو
جو پهنجو هڪڙوئي جٽل پٽ ڏنائه ڌ
جيکوکو تنهِ ني وِسناهُ آڻي سو چٽ
ڌ ڏيئي وڃڙ هميشه جيئڻ لهي

**103. SINDHI** *(Gurumukhi).*

ਜਾ ਖਾਂ ਤਏਸੁਰ ਜਗਤ ਪੇ ਇਹੜੇ ਪਿਆਰੇ ਰਖੇ ਜੋ ਪਰਜੇ
ਨਿਵਿਜੇ ਈ ਸਲਾਲ ਪੁਤ੍ਰ ਡਿਨਾਈਂ ਤ ਜੋਵੇ ਵੇ ਤਨਿ ਤੇ ਵੇਸਾਹੁ
ਆਣੇ ਸੇ ਨਾਸੁ ਨ ਥਿਏ ਵੇਤਰਿ ਸਦਾ ਜਿਅਣੁ ਲਹੈ ॥

**104. MOULTAN, or Wuch, or Ooch.**

ੜਅੜਅ ੬੪੬੯੮ ੨੬੮੭੨੯ ਅ੬ ੪੬੪੪੪ ੭੩ ੭੬ ਅ੭੬੧੭
ਅਅਮ ੪੨ ੪੪੬੯ ੪੬੨੮੮ ਮ ੩ ੭੬ ੩੯ ੭੬੬੨ ਅ੨ ੫੬ ਅ੬
੬੩ ੪੬੪੬੩ ੭੪੬੬੮ ਅ੬ ੯੪ ੩੯੮੭੬ ੪੬੯੬ ੪੬੬੪ ੪੬੬

**105. PUNJABI, or Sikh.**

ਕਿਉਂਕਿ ਪਰਮੇਸੁਰ ਨੈ ਜਗਤ ਨੂੰ ਅਜਿਹਾ ਪਿਆਰ ਕੀਤਾ, ਜੋਉਸ ਨੈ ਆਪਣਾ ਇਕਲੌਤਾ ਪੁਤ੍ਰ ਦਿੱਤਾ; ਤਾਂ ਤਰੋਕ ਜੋ ਉਸ ਪੁਰ ਖਤੀਦ, ਤਿਸ ਦਾ ਨਾਸ ਨਾ ਹੋਵੇ, ਸਗਹਾਂ ਸਦੀਪਕ ਜੀਉਣ ਪਾਵੇ।

**106. GONDI.** *(Central India.)*

जाहुने मीया उज्यारो जादलीकेना जुवे चमचे माई इदेन डिव
कि जोवे मीया ग़ल्लो जागतम दुखीकुव मीरोर खगेवाची दादाना
गुवानुवाद ओर ॥ *(Matt. v. 16.)*

**107. NEPALESE, or Parbutti.**

क्याहा ईश्वरले दुनियालाइ इत्तो पियारो गऱ्या कि उसल आफ्ना एकपेटा छोरालाइ दियो कि जो हरेक मानिस उसमाथी विश्वास गर्देछन् सो नाश न होउन् तर अनन्तजिन्दगी पाउन ।

**108. TELUGU.** *(S. E. India.*

మెందుకంటే దేవుడు లోకము ప్రేమించుట
యేలాగంటే—ఆయన యందు విశ్వాసముంచే
ప్రతివాడును నశించక నిత్యజీవము పొందేలా
తన జనితైక కుమారుని యిచ్చెను.

**109. CANARESE.** *(Mysore.*

ಯಾರೆಂದರೆ ಅವನಲ್ಲಿ ವಿಶ್ವಾಸವಿಡುವವರೆಲ್ಲರು ನಾಶ
ಹೊಂದಿದೆ, ನಿತ್ಯ ಜೀವವನ್ನು ಕೊಂಡುವ ಬಗ್ಗೆ,
ದೇವರು ಬಹುನಾಗಿ ಪ್ರೀತಿಸಿದ ತನ್ನ ಮಗನನ್ನು
ಕೊಡುವ ಹಾಗೆ, ತೋರವನನ್ನು ಅವನು ಪ್ರೀತಿ ಮಾಡಿ
ರನು.

**110. SINHALESE.** *(Ceylon.*

එබැහිවාද උන්වහන්සේ අදහා ගන්නා පිළි
ලෙලම් විනාස නොව සදකාල ජීවනය ලබන
පිණිස දෙවිසමිඳාණන්වහන්සේගේ ඒක
රාසාතුතා දෙමින් ලොවට එවමනා කරුණා කළ
සේක.

**111. PALI.**

ကယ်ဘာတံသဒ္ဓဟတ္တာ သဗ္ဗေ အဓိဂါသေတ္တာ
အာဒိတ္တဂ်ိတ်လသိတံ ဒေဝေါ သကေကရာထ
ပုတ္တံ ဒတွာ လောကမ်ေတ္တကမေမေသိ။

**112. TAMIL.**

தேவன். தம்முடைய ஒரேபேறான குமாரனை
விசுவாசிக்கிறவன் எவனோ அவன் கெட்
டுப்போகாமல் நித்தியசீவனை அடையு
மிடிக்கு, அவராத் தந்தருளி, இவ்வள
வாய் உலகத்தில் அன்புகூர்ந்தார்.

**113. DAKHANI, or Madras Hindustani.**

اور خدا کہا کہ آسمان کی جزاں میں روشنیاں ہوویں
کہ دِن کو رات سے جدا کریں اور وے نشانیاں اور زمانوں
اور دِنوں اور برسوں کے باعث ہوویں ۔ (Gen. i. 14.)

**114. MALAYALAM.** *(Travancore.*

അതുകൊണ്ടെന്നാൽ ദൈവം തന്റെ ഏകജാത
നായ പുത്രനെ, അവനിൽ വിശ്വസിക്കുന്ന
വൻ ഒരുത്തനും നശിച്ചുപൊകാതെ, നിത്യ
ജീവൻ ഉണ്ടാകെണ്ടുന്നതിന, തരുവാൻ തക്ക
വണ്ണം ലൊകത്തെ സ്നെഹിച്ചു.

**115. TULU.** *(W. of the Mysore.*

ದಾಯೆಗಂದಂದಾ ಯಡ ನಂಬನಾಯೆ ಯೆಶ್ಟ್ರ
ನಾಶನಾದಮೋವಂದೆ ನಿತ್ಯ ಜೀವಯ್ದನಾ ಯೆಲ್ಲಾದು
ಮ್ಯಳಿಕ್ಕದೇರೆರೆನ ದೊರಿಯಂದ ಮಟಿಮಗನ ಕಾಂಯೆ.
ರೆಬಾ ೀಕಯಿಂಜ್ಯೆ ಪ್ರೀತಿಸ್ಗೆ.

**116. MARATHI.** *(Western India.)*

कां तर देवाने जगावर एवढी प्रीति केली
कीं, त्याने आपला एकुलता पुत्र दिल्हा,
यासाठीं कीं जो कोणी त्यावर विश्वास
ठेवितो त्याचा नाश होऊं नये, तर त्याला
सर्वकालचें जीवन व्हावें.

**117. MARATHI** *(Modi).*

~~પ્રભુ એવો જગાત ઉપરી પ્રીતો પ્રેમ કીં, તાને~~
~~પોતાન એકિલતા પુત્ર દીધા, મગકી કીં જો~~
~~કોણી તાપર પીત્યાત કેપીતો તાચા નાશ~~
~~હોતાં નકે, પણ તાસ સર્વકાલચેં જીવન વ્હાવેં.~~

**118. GUJERATI.**

કેમકે દેવે જગત પર એવી પ્રીતિ કિધી, કે
તેણે પોતાનો એકાકીજનિત પુત્ર એ સારૂ આપ્યો
કે, જે કોઈ તે પર વિશ્વાસ કરે તેનો નાશ ન
થાએ, પણ અનંત જીવન પાએ.

### 119. PARSI-GUJERATI.

કેમકે એહદાએ દુનીઆ પર એવો પીઆર કીધો કે તેણે પોતાનો એકાકીજનીત બેટો એ વાસતે આપીઓ કે, જે કોઈ તેના ઉપર એતકાદ લાવે તે હલાક ન થાએ, પણ હમેરાંની જીંદગી પાએ.

### 120. INDO-PORTUQUESE. (Colonies in Ceylon.)

Parqui assi Deos ja ama o mundo, qui elle ja da sua só gerado Filho, qui quemseja lo cré ne elle nada ser perdido senão qui lo acha vida eterno.

### 121. ASSAMESE.

কিয় মানুহ পৃথিৱীত বিশ্বাস কৰে সেই সিবিনাহৈ সৰ্বসাক্ষ ন হয় কিন্তু অনন্ত আয়ুহে হয় এই কাৰণ ঈশ্বৰে আপোনি অদ্বিতীয় জাত এৱাই দিলে যেঁও এই ৰূপে জগতৰে চেনেহ কৰিলে।

### 122. KHASSI. (Eastern India.)

Naba kumta U Blei u la ïcit ia ka pyrthei, katba u la aitï-noh ia la U Khūn ia u ba-lït-khá-marwei, ba uei-uei-ruh u bangeit ha u, u'n 'nu'm jot shuh, hinrei u'n ioh ka jingïm b'ymjiukut.

### 123. SIAMESE.

ดังนั้นพระองค์เท้าทรงรักโลกนี้, จนถึงประทาน บุตรองค์เดียวของพระองค์, เพื่อทุกคนที่ได้เชื่อถือในบุตรนั้น, จะมิได้พินาศ, แต่จะมีชีวิตรอยู่ชั่วนิรันดร์.

### 124. PEGUESE. (Burmah.

ဘရေတ်ပွဲဗလး ဗိုညး တဲ့ရ၊ ပွဲအံ့ ယဗလး ဂ့်တဉ် ဒွင် ဗြဲဂိုတဲ့၊ ပွဲဂလောင် ဉိက် လဗဒ်ု စဉ်ဒက် ပွဲဝါ ဂ့်ဒုံတ်ညီး

(*Gal.* v. 1.

### 125. BURMAN.

ထုရဉးသစဝ်ထိသဘး တော်ကိုရုံကြည်လေသူအပေါင်းထိုသည်ပျက်ဖိုးခြင်းသို့ဇရောက်း အစည်ဘာဝရအသက်ရှင်ခြင်းကိုရရစခြင်းငှါတုရဉးသစင်သည်ဒဒ ဒွီတပါးထဉ်းလောသားတော်ကိုပွဒွီတော်မူသည်ထိုင်အောင်လေးကို လသးထိုဗိုချုပ်သခုးတော်မူထိုး

### 126. KAREN. (Burmah.

ဆ ၇ ာ်ဒ် ဆံး, ယွၢ်အဲဉ်ဟိဉ်ဒိဒ် တုၢ်အဟ့ ဉ်လီၢ်ကွံာ်အဖိွၤ် အိဉ်တၢ၊ ဘိ. ဒ်ဒိ ကထဲာ် ပှၤလၢအစူ ာ်ကွၢ်နှာ်ကွၢ်အီၤ တၢကလာ်လာ် ခ့.ဉ်ဒုတဟး ဂီၤတဂ့ၢ, ဒီးတခ့ ာ်တ ဉ်တာ်ဒူလီၤ ထုလီၤဃိာ်လီၤ.



### 127. BQHAI-KAREN.

တဲာ်လၢကစးထံးဘဉ်လဲးကဆိခ့ၢ်ဘဉ်ခ့ၢ်က ဒီးဘဲဘဉ်သံာ် သကဖၢလိာ် လဲာ်လဝဲး လဲးကဲး ထဂ့, လဲး ကဲး တစိကဖၢလိာ်လဲာ်လဝဲး လဲး ပး လဲး, အဖၢးခၢထုဉ်ရူးပရံးလဂ့. (1 *John* i. 8.)

### 128. SQAU-KAREN.

တၢ်လၢဃထံဉ်ဘဉ်, ဒီးပနှၢ်ဟူဘဉ်ခ့.ဉ်ပစံးဘဉ် ဇဲဘဉ်ဉ ဒံးဝိးဉုကရလိာ်ဉုးဒီးဟ့ၢအံ့လီၤ. ဒီးပ ဝဲဇ့်အံ့ပရ့လိာ်ပးဒီးဟ်, ဒီးအဖိွၤ်ထုဉ် ရူးပရံးလီၤ.

(1 *John* i. 8.)

### 129. PWO-KAREN.

ဘဲၢခိၢ်,အိဉ်ခ့ဉ်ာအဆဒဟ့ခိၢ်, ပွဲအဟ့ထဉ်ဒဉ်ဂၢ လဒပှ့ၢ်ၢအမ့ၤထေၢ, ဘဲၢအဝိဆဘခ့ဉ်ာမၢ်ဆဒဂ့ အဒိဉတဒ့, ဝိဒဉ်ထဉ်အဉ်ဒဉ်ခ့ဉ်ာအဖၢိအိၢ်တ့ၢလဒမ့ဉ် ခြိၢအဖၢခ့ၢ်ခိၢ်ဆဒ်ဒ့.

(*Matt.* v. 16.)

### 130. TIBETAN.

དགེན་མཆོག་གིས་ཇི་ལྟར་བྱས་ཏེའོ་སྙམ་བཅིངས་པ་ཙམ་ན་ཐལ་དང་ཐལ་བ་མཚོན་ཆས་ཀྱིས་ཀྱང་ཐ་བ་མཚོན་ཆས་ཏེ་ཡི་དང་པ་ཐམས་ཅད་ཀྱི་ཚེ་མི་ཤི་ཞིང་ཐ་བ་ཡིན་ཏེ། མཐའ་མེ་བྱང་ཆུབ་ཀྱི། མཐའ་མེད་པའི་སྡུག་བསྔལ་མེད་པར་བྱའོ།།

### 131. MALAY.

كرنا دميكين ثربن الله سرده مغاسيهي ايسي دنيا سهيغك كرنياكن انقن يغ ترغكل سغلي بارغسيافت يغ ثرچلي اكن دي تياد اكن بناس هاي مندافت كهيدوفن يغ ككل.

### 132. MALAY (Roman).

Kūrna dūmkianlah halnya Allah tŭlah münga, sihi orang isi dunia ini, sahingga dikurniakannya Anaknya yang tunggal itu, supaya barang siapa yang pürchaya akan dia tiada iya akan binasa, mülainkan mündapat hidop yang kükal.

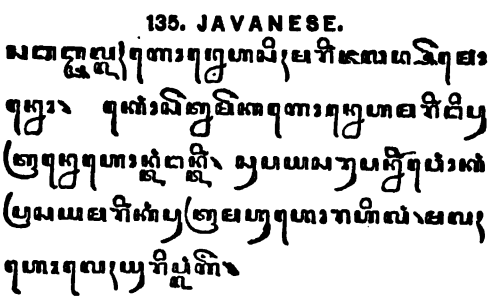
### 133. LOW MALAY, or Soerabayan. (Batavia.)

Karna sabagitoe sangat Allah soedah mengasehi isi doenia, sahingga ija soedah membri Anaknja laki-laki jang toenggal, soepaja sasaorang jang pertjaja akan dia, djangan binasa, hanja beroleh kahidoepan kakal.

### 134. DAJAK. (*Borneo.*)

Krana kalotä kapaham Hatalla djari sinta kalunen, campei iä djari menenga Anake idjä tonggal, nakara gene-genep olo, idjä pertjaja huang iä, ăla binasa, baja mina pambelom awang katatahi.

### 135. JAVANESE.



### 136. BALINESE. (*Dutch E. Indies.*)

Mapan kèto pitresnan Hida sanghyang Widi tkèn djagaté makedjang, tka Hida nedoenang hokané né sanoenggal kahoetoes mahi, kna Cilang hanaké né ngandelang hi hoka boehoeng naraka, nanging kna hya nepoekin kahidoepan tan pegat.

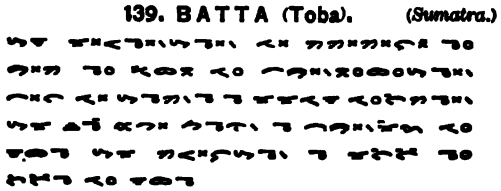
### 137. SUNDANESE.

Ajeuna mah dek indit ngadeuheusan ka bapa, sarta rek oendjoekan kijeu: Noen ama, simkoering geus tarima migawe dosa ka sawarga sarĕng di pajoeneum ama.—(*Luke* xv. 18.)

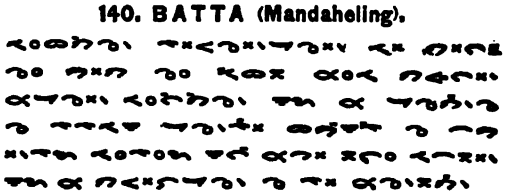
### 138. NIAS. (*Island near Sumatra.*)

Ando wa lawá'o ira ma'afĕfu: Ya'ūgō hūlō dā sŏgi O'no Lōwaláńi? Ba maňuā'o Ia hōrā ando: Iāmi ande maňuā'o, mĕ Ia'ódǫ ande sǫ́ Ia andó.—(*Luke* xxii. 70.)

### 139. BATTA (Toba). (*Sumatra.*)



### 140. BATTA (Mandaheling).



### 141–144. CHINESE.

#### 141. Classical.

蓋神愛世、甚至以其獨生之子賜之、俾凡信之者、免沉淪而得永生。

#### 142. Mandarin.

天主憐愛世人、甚至將獨生子賜給他們、叫凡信他的不至滅亡、必得永生。

#### 143. Foochow (Colloquial).

因爲神拳將欸愛世間、賜獨生其仔、以致大凡信伊其仏都實沉淪去、是能得長長生活。

### 145–148. CHINESE.

#### 145. Swatow (Colloquial).

起頭的時候、耶華創造天地。(Gen. I. 1.)

#### 146. Shanghai (Colloquial).

因爲 神愛世界上人、造於實蓋、拿伊獨養兒子、賞撥伊拉、以致凡係相信兒子个人、勿滅脫咾得着永生。

#### 147. Soochow (Colloquial).

因爲神實蓋愛世界上人、至於拿俚獨養兒子、賞給俚爲、以致凡係相信俚个人、勿滅脫倒得着永生

**144. NINGPO (Colloquial) (*Roman*).**

Ing-we Jing-ming sz-sih shü-kæn-zông tao ka-go din-di, we s-lôh Gyi-zi-go doh-yiang ng-ts, s-teh væn-pah siang-sing Gyi cü-kwu feh-we mih-diao, tu hao teh-djôh üong-yün weh-ming.

**148. AMOY (Colloquial) (*Roman*).**

Siông-tè chiong tòk-siⁿ è Kiaⁿ siuⁿ sù sè-kan, hō sin i è lâng m̄ sái tim-lûn oē tit-tiòh eng-oáh; I thiaⁿ sè-kan è lâng kàu án-ni.

**149–152. CHINESE.**

**149. NANKING (Colloq).**

上帝把獨生的兒子、賜給世人、使那信他的人、免得永遠受苦、可以得着長久的生命、上帝愛惜世人如此。

**150. CANTON (Colloq).**

因爲上帝愛世界、甚至捵佢獨生之子賜過佢地、令但凡信佢嘅、免至滅亡、又得永生。

**151. SHANGHAI (Colloquial) (*Roman*).**

Iung-wæ' Zung juk sz'-ka long' kuk niung lau, soong' pæh ye kuk dōk 'yang Nie-'ts, s' fæh kiû sa' niung, siang-sing' ye mæh, fæh mih-t'æh lau, tuk-dzak 'ioong-'yöⁿ wæh la'.

**152. SWATOW (Colloquial) (*Roman*).**

Uá aiⁿ khi-sin lâi-khù uá-pō--kò, kāng i tèⁿ. Pē a, uá tit-tsuē-tiēh thiⁿ kuā tō lú mn̄-taôiⁿ.—(*Luke* xv. 18.)

**153–154. CHINESE.**

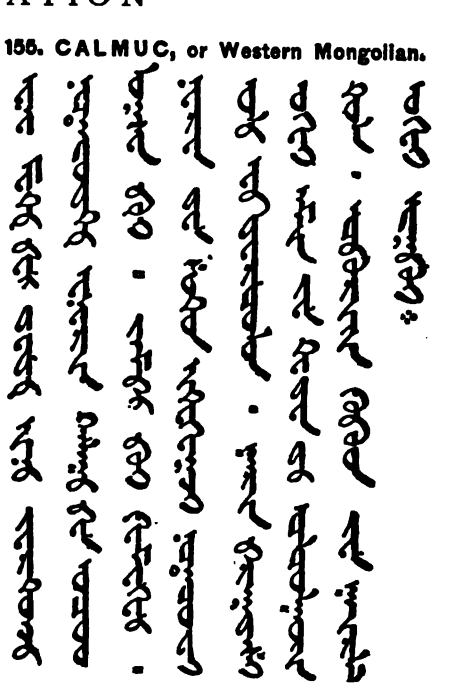
**153. HAKKA (Colloquial) (*Roman*).**

Thai -famᵈ yu, sin-khu', khai, tshuṅ,-tam, kai' ṅyin, han' loi, tshyu, ṅai,, ṅai, pin, ṅi, phin,-on,. —(*Matt.* xi. 28.)

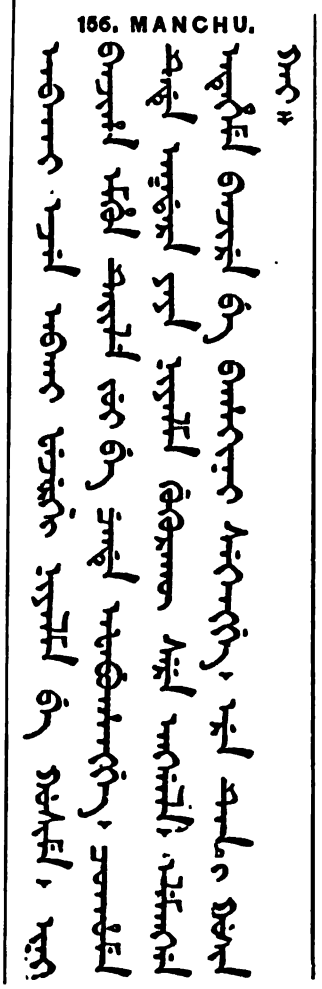
**154. CANTON (Colloquial) (*Roman*).**

*Noᵗ tsṵṅ, fān, hu' toˋ ṅoᵗ loᵗ tauˆ koˋ ṅu', tus khu' waˆ : aˋ pa, ṅoᵗ tak, tsuiˆ thin, kuṅˆ aˋ pa, siᵗ.*—(*Luke* xv. 18.)

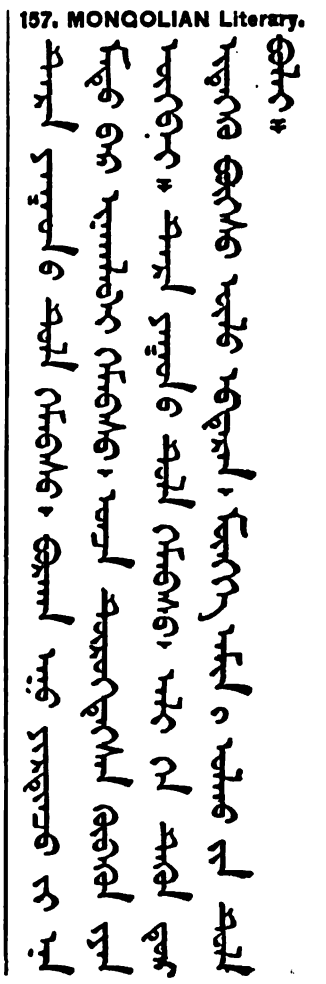
**155. CALMUC, or Western Mongolian.**



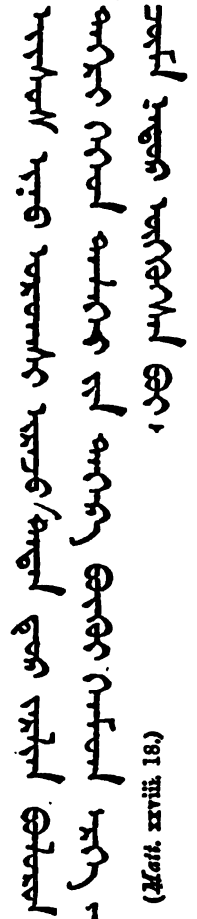
**156. MANCHU.**



**157. MONGOLIAN Literary.**

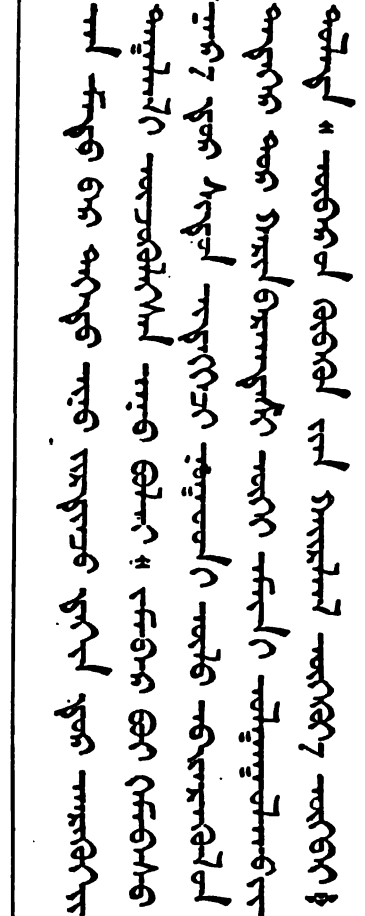


**158. MONGOLIAN (Colloquial).**

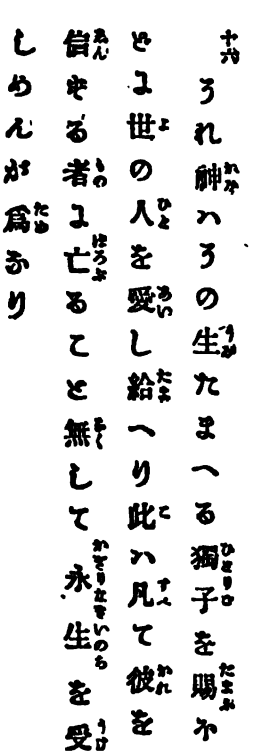


(*Matt.* xviii. 18.)

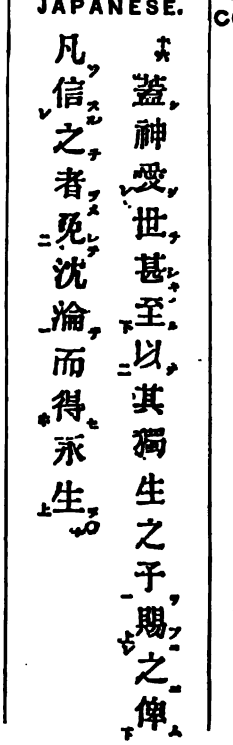
**159. MONGOLIAN (Buriat Colloquial).**



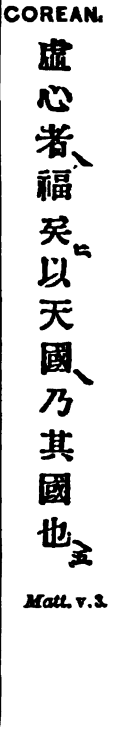
**160. JAPANESE.**



**161. CHINO-JAPANESE.**



**α 161. CHINO-COREAN.**



*Matt.* v. 3.

**162. JAPANESE** (*Roman*).

Sore, Kami no seken wo itsukushimi-tamau koto wa, subete kare wo shindzuru mono wa horobidzu shite, kagiri naki inochi wo uken tame ni, sono hitori umareshi ko wo tamayeru hodo nari.

**163. MALAGASY.** (*Madagascar.*)

Fa izany no nitiavan' Andriamanitra izao tontolo izao, fa nomeny ny Zanaki-lahi-tokana, mba tsy ho very izay rehetra mino Azy, fa hahazo fiainana mandrakizay.

**164. NARRINYERI.** (*Australia.*)

Lun ellin Jehovah an pornun an Narrinyeri: pempir ile ityan kinauwe Brauwarate, ungunuk korn wurruwarrin ityan, nowaiy el ityе moru hellangk, tumbewarrin ityе kaldowamp.

**165. MAORI.** (*New Zealand.*)

Na, koia ano te aroha o te Atua ki te ao, homai ana e ia tana Tamaiti ko tahi, kia kahore ai e mate te tangata e whakapono ana ki a ia, engari kia whiwhi ai ki te oranga tonutanga.

**166. NENGONE, or Mare.** (*Loyalty Isles.*)

Wen' o re naeni Makaze hna raton' o re ten' o re aw, ca ile nubonengo me nunuone te o re Tei nubonengo sa so, thu deko di ma tango ko re ngome me sa ci une du nubon, roi di nubone co numu o re waruma tha thu ase ko.

**167. LIFU.**

Hna tune la hnimi Cahaze kowe la fene hnengödrai, mate nyidati a hamane la Nekö i nyidati ka casi, mate tha tro kö a meci la kete i angete lapaune koi nyida, ngo tro ha hetenyi la mele ka tha ase palua kö.

**168. IAIAN.**

Helang ibetengia anyin Khong ka ang meledran, e ame ham Nokon a khaca thibi, me me ca he ka mok ke at ame labageju kau, kame he ka hu moat ame ca ba balua.

**169. ANEITYUM.** (*New Hebrides.*)

Is um ucce naiheuc vai iji pece asega o Atua is abrai Inhal o un is eti ache aien, va eri eti emesmas a ilpu atimi asgeig iran asega, jam leh nitai umoh iran ineig inyi ti lep ti.

**170. EROMANGA.**

Müve kĭmi, mō mumpi ōvun nūriē enyx, ōvun numpūn lō sū, wumbaptisō iranda ra nin eni Itemen, ĭm ra nin eni Netni, ĭm ra nin eni Naviat Tumpora.—*Matt.* 28: 19.

171. FATE.

Leatu ki nrum emeromina nin, tewan kin ki tubulua Nain iskeimau i mai, nag sernatamol nag ru seralesok os ruk fo tu mat mou, me ruk fo biatlaka nagmolien nag i tok kai tok mou tok.

172. FIJI.

Ni sa lomani ira vaka ko na Kalou na kai vuravura, me solia kina na Luvena e dua bauga sa vakasikavi, me kakua ni rusa ko ira yadua sa vakabauti koya, me ra rawata ga na bula tawa mudu.

173. ROTUMAN.

Ne e fuamamau ne hanis on Oiitu se rantei, ia na on Lee eseama, la se raksa teu ne lelea ne maa se ia, la iris po ma ke mauri seesgataaga.

174. TONGAN. (*Friendly Islands.*)

He nae ofa beĥe ae Otua ki mama ni, naa ne foaki hono Alo be taha nae fakatubu, koeuhi ko ia kotoabe e tui kiate ia ke oua naa auha. kae ma'u ae moui taegata.

175. NIEUÉ, or Savage Island.

Nukua pihia mai e fakaalofa he Atua mai ke he lalolagi, kua ta mai ai hana Tama fuataha, kia nakai mate taha ne tua kia ia, ka kia moua e ia e moui tukulagi.

176. SAMOAN. (*Navigator's Island.*)

Auā ua faapea lava ona alofa mai o le Atua i le lalolagi, ua ia au mai ai lona Atalii e toatasi, ina ia le fano se tasi e faatuatua ia te ia, a ia maua e ia le ola e faavavau.

177. RAROTONGAN. (*Cook's Island.*)

I aroa mai te Atua i to te ao nei, kua tae rava ki te oronga anga mai i tana Tamaiti anau tai, kia kore e mate te akarongo iaia, kia rauka ra te ora mutu kore.

178. TAHITIAN. (*Society Islands.*)

I aroha mai te Atua i to te ao, e ua tae roa i te horoa mai i ta'na Tamaiti fanau tahi, ia ore ia pohe te faaroo ia 'na ra, ia roaa rā te ora mure ore.

179. MARQUESAN.

Ua kaoha nui mai te Atua i to te aomaama nei, noeia, ua tuu mai oia i taia Tama fanautahi, ia mate koe te enata i haatia ia ia, atia, ia koaa ia ia te pohoe mau ana'tu.

180. EBON. (*Marshall Islands.*)

Bwe an Anij yokwe iol, einwot bwe E ar letok juon wot Nejin E ar keutak, bwe jabrewot eo ej tomak kin E e jamin joko, a e naj mour in drio.

181. KUSAIEN. (*Strong's Island.*)

Tu God el lunsel fwalu ou ini, tu el kitamu Mwen siewunu isusla natal, tu met e nu kemwu su lalalfuni k'el elos tiu mise, a mol lalos mapatpat.

182. GILBERT ISLANDS.

Ba e bati taniran te aomata iroun te Atua, ma naia are e ana Natina ae te rikitemana, ba e aona n aki mate ane onimakina, ma e na maiu n aki toki.

183. PONAPE. (*Ascension Island.*)

Pue Kot me kupura jappa ie me a ki to ki Na ieroj eu, pue me pojon la i, en ter me la, a en me maur jo tuk.

184. MORTLOCK.

Pue an Kot a *tane* fanufan mi *r*apur, ie mi a *n*anai na an Alaman, pue monison mi luku i ra te pait mual la, pue ra pue uerai manau samur.

185. HAWAIIAN. (*Sandwich Islands.*)

No ka mea, ua aloha nui mai ke Akua i ko ke ao nei, nolaila, ua haawi mai oia i kana Keiki hiwahiwa, i ole e make ka mea manaolo ia ia, aka, e loaa iā ia ke ola mau loa.

186. ETHIOPIC.

እስመ: ኀመ: ፈቀር: ዘገዚአብሔር: ለዓለሞ: እስ: ወልዶ: ዋሕዶ: ወሀበ: ቤዛ: ኀመ: ኩሉ: ዘአሞን: ቦቱ: ኢይትሐጐል: አላ: ይረክብ: ሕይወተ: ዘለዓለሞ::

187. AMHARIC. (*Abyssinia.*)

እግዚአብሔር: እንደሁ: ዓለምን: ወድዋል: አንድ: ልጁን: እስኪለው: ድረስ:: በርሱ: ያመነ: ሁሉ: እንደይጠፋ: የዘለዓለም: ሕይወት: ትሆንለት: ዘንድ: እንጅ::

188. TIGRE. (*Abyssinia.*)

ኸሞዚውማ: ፈትወ: እግዚአብሔር: ዓለሞ: ክሳብ: ዝሀቦ: ብሕቲ: ጌዝተወልዶ: ወዶ: ኸይጠፍእ: ኩሉው: ዚአሞን: ብኣኡ: ክትኮነሉ: እሞበር: ሕይወት: ዘለዓለሞ:

189. COPTIC. (*Egypt.*)

Παιρητ ϵαρ ⲁϥⲧ ⲙⲉⲛⲣⲉ ⲡⲓⲕⲟⲥⲙⲟⲥ ⲉⲱⲥⲧⲉ ⲛⲉϥⲥⲱⲛⲣⲓ ⲙ̀ⲙⲁⲣⲁϥ ⲛ̀ⲧⲉϥⲧⲛⲓϥ ⲉⲓⲛⲁ ⲟⲩⲟⲗⲗⲱⲉⲗ ⲉⲑⲛⲁϩⲣⲧ ⲉⲣⲟϥ ⲛ̀ⲧⲉϥ-ⲥⲩⲧⲉⲙⲧⲁⲕⲟ ⲁⲗⲗⲁ ⲛ̀ⲧⲉϥⲥⲓ ⲛⲟⲩⲱⲛϩ ⲛ̀ⲧⲉⲣⲉϩ.

190. GALLA. (*South of Abyssinia.*)

Waka akana tshalate tshira alami, Umasa tokitsha aka keñe, kan isati amăne aka henbăne, tahenan feia alā tauffe garra duri.

191. KINIKA.

Nao ossi agomba, hikara uwe ni mana wa Mulungu? aka gomba, muimui munaamba, ni mimi endimi.—*Luke* 22· 70.

**192. SWAHILI.** (*E. Coast of Africa.*)

Kwani ndivyo Muungu alivyoupenda ulimwengu, akatoa na Mwana wake wa pekee, illi wote wamwaminio waupate uzima wa milele wala wasipotee.

**193. SECHUANA.** (*South Africa.*)

Gone Morimo o lo oa rata lehatsi yalo, ka o lo oa naea Moroa ona eo o tsèooefi a le esi, gore mofiue le mofiue eo o rumèlafi mo go èna, a si ka a hèla, mi a ne le botselo yo bo sa khutlefi.

**194. SESUTO.**

Gobane Molimo o ratile lefatsé hakälo, o *le* neile Mora oa oona a tsuetseng a 'notsi; gore e mong le e mong a lumelang go éena, a sé ke a fèla, a mpe a be le bophélo bo sa feleng.

**195. ZULU.** (*South Africa.*)

Ngokuba uTixo wa li tanda kangaka izwe, wa li nika inDodana yake ezelweyo yodwa, ukuba bonke aba kolwa kuyo ba nga bubi, kodwa ba be nobomi obungapeliyo.

**196. OTIYEHERERO.** (*South Africa.*)

Me serekarere omuhingo: Yehova ua tyere ku ami;: "Ove omuatye uandye, m'eyuva ndi mbe ku koatere."—*Psalm* 2: 7.

**197. KAFIR.** (*South Africa.*)

Ngokuba Utixo walitanda ilizwe kangaka, wada wanika unyana wake okupela kwozelweyo, ukuze osukuba ekolwa kuye angabubi, koko abe nobomi obungunapakade.

**198. DAMARA.** (*South Africa.*)

Omukuru oty'a suverere ouye, kutya e ua opere mukoateua ue erike, auhe ngu mn kampura mu ye, ope ha panyara, nokutya ga kare nomuinyo bu ha yanda.

**199. NAMACQUA.** (*South Africa.*)

llNatigoseb gum Eloba ǂhûb-eiba gye lnamo, ob gye llëib di lguise ǂnai hã lgõaba gye ma, llëib ǂna ra ŧgomn hoan gã-Jlõ tite se, χawen nĭ lamö ũiba û-ha se.

**200. DUALLA.** (*West Africa.*)

Loba lo bo wasi ndulo, na a boli mpom mau mo Muna, na motu na motu nyi dube tenge na mo, a si manyami, 'ndi a ma bene longe la bwindia.

**201. IBO.** (*West Africa.*)

*Ma otudhan Tiáku ḥọ̀nụ ẽlu'-wana na dnya, ma ya nyére otu ọli Ọpáraya, ma onye gwúna kwéreya, ogagi ẹ̀fù, ma ga èwete ndu ẽbigebi.*

**202. HAUSSA.** (*West Africa.*)

*Don Alla ya so dunia hakkanan ši ya bada Dansa nafari, en kowa ya yirda daši, ba ši gbata ba, amma ši yi rai hal abbada.*

**203. NUPÉ.** (*West Africa.*)

*Lugọ ẹbayetinye un nán atši eye ezabo, a-a-le etun wangi 'yeye, a-fe džin yebo ndaye nan dan alidžana nan.*—(*Matt.* v. 16.)

**204. YORUBA.** (*West Africa.*)

Nitori ti Ọlọrun fẹ araiye tobõ gẹ, ti o fi Ọmọ bibi rẹ nikanṣoṣo fun ni pe, ẹnikẹni ti o ba gbà a gbó ki yio ṣegbé, ṣugbọn yio ni iye ti ko nipẹkun.

**205. ACCRA, or Ga.** (*West Africa.*)

Ṣi nẹkẹ Nyongmo sumo dẹ lẹ, akẹ e ngõ e bi kome, ni a fọ lẹ, e hâ, koni mofùmo, ni heọ e nô yeọ lẹ, hie a ka kpata, ṣi e na nanô wola.

**206. TSCHI, or Twi.** (*West Africa.*)

Nà sẹnea Onyaṅkõpọṅ dọ wiase ni, sẹ ọde ne ba a ọwoo no koro mãe, *na* obiara a ogye no di no anyera, na wanyã dã ṅkwã.

**207. MANDINGO.** (*West Africa.*)

Katuko Alla ye dunya kannu nyinuyama, an ading wulukilering di, mensating mo-omo men lata ala, ate tinyala, barri asi balu abadaring sotto.

**208. MENDE.** (*West Africa.*)

*Gbãmailį́ Ngẹ́wọ iyẹ lọ̀i lo ti a ndẓ̀loi, ta lo i ngi lọ̀i yakpẹ́i vẹ́ni, iyẹ jọ́ni; ta lo nũmui gbi lo ngi họ̀na lo a tẓ̀nya, ẓ lọ̀ĩ, kẓ kũnafo lẓ̀vu lo a ịg.*

**209. TEMNE.** (*West Africa.*)

*Tũa yọ K'ára ọ pot. bẓ̀ẓr ara-rũ, kã ọ sọnd Ọw'éa-P'ọh ọ kom gbo edu, káma w'éni ó w'éni, gwọ́ láng-kẹ, ọ tẽ̃ dinnẹ; kẓ́rẹ káma ọ ọ̀ẓlo a-hàoẹm alabána.*

**210. BENGA.** (*West Africa.*)

Kakana ndi Anyambĕ a tândâki hc, ka Mâ-a vĕ Mwan' 'aju umbâkâ, na, nĕhĕpi a ka kamidĕ Mâ, a nyange, ndi a na emĕnâ ya egombe yĕhĕpi.

**211. GREBO.** (*West Africa.*)

Kâre kro Nyesoa nuna konâ ăh nowănena, â hnyina â sĕyĕ ăh ḳokâ-yu donh, be nyâ bc â po nâ hanhtc, â neh te wanh, nĕma â mu konâ-se-honhnonh kâ.

**212. MPONGWE.** (*West Africa.*)

Kânde Anyambiĕ arândi ntye yinlâ nli ntândinli mĕ avenliĕ Onwanli yĕ wikika, inlĕ om' edu o bekeliĕ avere, ndo e be doanla nl'efiĕnlâ zakânlakâ.

**213. DIKELE.** (*West Africa.*)

Nadiambilindĭ Anyambiĕ a midinh pĕnzhe nyi na thadinh thatĭ thõ tha yĕ mivĕ Miana ngwĕi ngwadikika, na mutyi jĕshĕ ngwa yĕ bundilĕ a tyi magwa, nji a bĕ' na thaki' th' adukwa jeshõ.

**214. GALLA.** *(South of Abyssinia.)*

ቀቃዮን ፡ አካናኒ ፡ ቢያ ፡ ለፈ ፡ ዮፈ ፡ ጀለቲራ ፡፡ ኢለማ ፡ ዮፈ ፡ ተክቻ ፡ ጠከማ ፡ ኪኑቲ ፡፡ ከን ፡ ኢሳቲ ፡ አመኑ ፡ ሁንጂ ፡ አካንከኔ ፡፡ ፈጀማ ፡ በራ ፡ በራቲ ፡ ኢታቲፍ ፡ መሌ ፡፡

**215. BULLOM.** *(Near Sierra Leone.)*

Ntunky kandirr no tre kĕ aniah ëboll, leh ngha ngha keh mpant no nkeleng, nu kulluh papah no, wonno cheh ko kĕ foy.—(*Matt.* v. 16.)

**216. EWE.** *(Gold Coast.)*

Ke ši ke nenem Mawu clŏa xexe la me, bena etšo ye ùùtǫ vidšidši deka he na, ne amę sya amę, si exo edši ese ko la, mele tšǫtšrǫ ge wò, nękpe wòakpǫ agbè mavǫ la.

**217. BERBER.** *North Africa.*

مَذَبَلّ مَعَلّم كُنُو ذِمَولَن اَلهَم مَعسَنَم اُتبَكَم اَرو
اَنَون اَلمَعطَ اَلعَالِ اُفَقَدش اُمبَابعَون اُفقَنَاو
اَذبِك اَلرّح اَلعَالِ اِبَان اُعتسَفسِن

(*Luke* xi. 13.)

**218. GREENLAND.**

Sillarsûb innue Gudib taima assakigei, Ernetue tunniullugo taukkonunga, tamarmik taursomunga opertut tammarkonnagit, nâksaungitsomigle innursûtekarkollugit.

**219. ESQUIMAUX.**

Taimak Gudib sillaksoarmiut nægligivelt, Ernetuane tunnilugo, illunatik okpertut tapsomunga, assiokonnagit nungusuitomigle innogutekarkovlugit.

**220. CREE** *(Roman).* *(British America.)*

Weya Muneto â ispeóche saketâpun uske, kĕ mâkew oo pauko-Koosisana, piko una tapwâtowayitche numowcya oo ga nissewunatisséty, maka oo ga ayâty kakekâ pimatisewin.

**221. CREE.**

ᐯᐱᐢᑭ ᐃᑭᐢᒋ ᑭᓯᒪᑐ ᐊᑕᑭᓂ ᓇ ᑭᐢᑫᐢᑭ ᒣᐟ ᑫᐯᓴᑦᐃᑉᐧᑏ, ᐊᐃᓴᐣ ᑫᒋᐯᐧᐊᓴᐃᒪᑫ ᐅᓇ ᑭᐢ ᒋᐟᐊᐧᑏᐱᐢᑎᐟ, ᒪᓇ ᑭᐢ ᐊᓴᐟ ᓇᑭᐟᐃᓂ.

**222. MICMAC.** *(Nova Scotia.*

Mûdu Niseçam teliksatcus msitoumuu - wedjį igunum-tûede-gub-unn nsuktuu-bistadjul mowisul, culąmąn m'sit wen tąn kedlamsito utįninou, mą mnmadt jinpmc, cądu muceets aoçmąwe mjmadjmocun.

**223. TINNE.** *(Hudson . Bay.)*

ᑎᐅᑊ ᐅᑎᐯ ᒪᖏ ᐧᒣᑐᐟ ᐅᓴᑦ ᑌᓴᓯ ᒪᒍᑎᐟ, ᑦᐟ ᑎᓴᑖ ᐅᓴ ᐯᑎ ᓄᑊ ᐅᓴᑦ ᑭᑖᑦ ᐅᑎᑊ, ᐅᓴᐅᐅᓴᐅᑦ ᐃᓴᐅᑦ ᐅᑎᑊ.

**224. CHIPPEWAYAN.**

Apeech shahwaindung sah Keshamunedoo ewh ahkeh, ooge-oonje megewanun enewh atah tatabenahwa Kahoogwesejin, wagwain dush katapwayainemahgwain chebahnahdezesig, cheahyong dush goo ewh kahkenig pemahtezewin.

**225. TUKUDH.** *(Loucheux Indians.)*

Kwugguh yoo Vittukoochanchyo nunh kug kwikyit kettinizhin, tih Tinji chihthlug rzi kwuntĮntshį chootyin tte yih kyinjizhit rsyettetgitltelya kkwa, kǫ sheggu kwundui tettiya.

**226. MALISEET.** *(New Brunswick.)*

Eebŭchŭl Nŭkskam ĕdooche-moosajitpŭn ooskĭtkŭmĭkw wĕjemcloočtpŭn wihwebu Ookwŏŏsŭl, wĕlaman 'msou wĕn tan wĕlămsŭtŭk oohŭkăk, skatŭp ŭksekăhăwe, kănookŭloo ooteĭnp askŭmowsooagŭn.

**227. MOHAWK.** *(N. Am. Indian.)*

Iken ne Yehovah egh ne s'hakonoronghkwa n'ongwe, nene rodewendeghton nene raonhàon rodewedon rohhàwak, nene onghka kiok teyakaweghdaghkon raonhage yaghten a-onghtonde, ok denghnon aontehodiyendane ne eterna adonhèta.

**228. CHOCTAW.** *(N. Am. Indian.)*

Chihowa yvt yakni a į hullo fehna kvt, kvna hosh yvmma į yimmikmvt ik illo hosh, amba ai okchąyvt bilia yǫ pisa hi o, Ushi achvfa illa holitopa yą auet ima tok.

**229. SENECA.** *(N. Am. Indian.)*

Neh sąh'ąh ne' sòh jih' ha nò'oh gwah Na'wĕn ni yòh' he'yǫ ăn ja deh, Neh No'a wak neh" shǫ' kuh agat ho wi'yą yąh tot gah wąh' ha o'gweh da wiih heh yǫ ăn'ja deh'; neh neh, Son'dih gwa'nah ot ą wą'i wa gwĕn ni yòs, tąh ąh' ta ye'i wah doh', neh gwaa', nă yò'i wa da dyeh' ą ya'go yăn daht' ne' yoh heh'o weh.

**230. DAKOTA.** *(N. Am. Indian.)*

Wakantanka oyate kin cantewicakiya, heon Cinhintku ĺśnana icage cin wicaqu, qa tuwe awacin kinhan owihanke kte śni, tuka owihanke wanin wiconi yuhe kta.

**231. OJIBWA.** *N. Am. Indian.)*

Gaapij shauendy su Kishemanito iu aki, ogionjimigiuenvn iniu baiezhigonijin Oguisvn, aueguen dvsh getebucienimaguen jibvnatisisig, jiaiat dvah iu kagige bimatiziuin.

**232. MUSKOKEE.** *(N. Am. Indian.)*

Hesaketvmese ekvnv vnokece mahet omekv, Eppuce hvmkuse heckuecvte emvtes, mvn estimvt oh vkvsamat estemerkekot, momis hesaketv yuksvsekon ocvren.

**233. CHEROKEE.** *(N. Am. Indian.)*

ᎾᏍᎩᏯ ᏂᏚᎩ ᎤᏁᎳᏅᎯ ᎤᏲᎦᎡᎩ ᎡᎶᎯ, ᏭᎤᏰᎩ ᎤᏃᏕᎾ ᎤᏁᎳᏅᎯ ᎦᏙᎦ ᎤᏂᏲᎤᎵᏍᏗᏉ ᎾᏍᎩᏯ ᏍᎦᏚᎩ ᎤᏂᏲᎤᎵᏍᏗᏉ ᎠᏂᏧᏣ ᎤᏂᏃᏮᏍᏗ.

**234. DELAWARE.** *(N. Am. Indian.)*

Woak ; necama gulliechtagunenanall kmattauchsowōagannenanall, taku kiluna nechoha, schuk ulaha wemi elgigunk haki omattauchsowoagano va oliechtonepanni.—1 *John* 2: 2.

**235. NEZ PERCES.** *(N. Am. Indian.)*

Kuuki wiwilhnath, awitaalshkailkith, uyikashliph, wiwatashph, Awibaptainailkith immuna Pishitpim wanikitph, wah Miahspim. Wanikitph, Wah Holy Ghostnim wanikitph.—*Matt.* 28: 19.

**236. MAYAN.** *(Yucatan.)*

Tumen bay tu yacuntah Dioz le yokolcab, ca tu caah u pel mchenan Mehen, utial tulacal le max cu yoczictuyol ti leti, ma u kaztal, uama ca yanacti cuxtal minanuxul.

**237. MEXICAN, or Aztec.**

Ni mchuaz yhuan ni az campa cā in no tātzin yhuan nic ilhuiz: No tātzin é, oni tlātlacō ihuicopa in ilhuicatl yhuan mixpan tōhuatl.—(*Luke* xv. 18.)

**238. NEGRO-ENGLISH.** *(Surinam.)*

Bikasi na so fasi Gado beu lobbi kondre, va a gi da *wan* Pikien va hem, va dem allamal, dissi briebi na hem, no sa go lasi, ma va dem habi da Liebi vo tehgo.

**239. CREOLESE.** *(West Indies.)*

Want soo Godt ka hab die Weereld lief, dat hem ka giev sie eenig gebooren Soon, dat sellie almael die gloov na hem, no sal kom verlooren, maer sal hab die eewig Leven.

**240. AYMARA.** *(Peru.)*

Hucama Diosaja mundo munana, sapa Yokapa quitani, taque haquenaca iau-siri ifiayan hacafia-pataqui.

**241. ARRAWACK.** *(Guiana.)*

Lui ké uduña abba Wadili uria karaijakubá je namaqua Wunabu ubannamámutti, nassikoattoanti tuhu Wunabu ubafiamün. Lui kéwai assikissia namün ikissihü, pattahü na kakünti, hallidi na kassikoanibia ba ukunnamün.—*Acts* 17: 26.

**242. QUICHUAN.** *(Argentine.)*

Pachacamackca chicatami runacunata munarca, chay Zapallay-Churinta kokcurca, tucuy paypi yfiiic, mana huafiunanpac, uifiay cauzaytari apinanpac.

BIBLIA PAUPERUM OR BIBLE OF THE POOR, was a sort of picture-book of the middle ages, giving the leading events of human salvation through Christ, each picture being accompanied by an illustrative text in Latin. (See BIBLIOGRAPHY, Vol. III, p. 653.) A similar work on a more extended scale, with the text in rhyme, was called *Speculum Humanæ Salvationis*, or *Mirror of Human Salvation*. Before the Reformation these two books were the chief text-books used, especially by monks, in preaching. Many manuscripts are preserved in different languages, several as old as the thirteenth century. The pictures were copied in sculptures, altar-pieces, etc. The chief proof of the invention of printing by Koster in Haarlem rests on the first impressions of the *Speculum Humanæ Salvationis*.

BIBLE SOCIETIES OF THE WORLD. The following is a compendium of the different Bible Societies of the world, compiled from the lists reported to the American and British and Foreign Bible societies to Jan. 1, 1895. It shows the dates of organization and the total number of copies of the Scriptures issued severally by the various societies so far as reported up to March 31, 1895. The circulation reported by the British and Foreign Bible Society includes the issues by the various Bible societies of India, amounting to a total from those societies of 10,961,011.

| | Total Issues. |
|---|---|
| American Bible Society, 1816 | 59,955,558 |
| American and Foreign Bible Society, 1837 | 2,293,665 |
| American Bible Union, 1850 | 603,184 |
| Bible Association of Friends in America, 1830 | 154,431 |
| British and Foreign Bible Society, 1804 | 143,396,230 |
| National Bible Society of Scotland, 1861 | 15,840,899 |
| Hibernian Bible Society | 4,968,450 |
| Trinitarian Bible Society, in 1884–85 | 281,426 |
| Basel Bible Society, 1804 | 833,905 |
| Prussian Bible Society, at Berlin. 1814 | 6,621,622 |
| Swedish Bible Society, 1809 | 1,121,487 |
| Finnish Bible Society, at Åbo, 1812 | 239,273 |
| Russian Bible Society, St. Petersburg, 1812 | 861,105 |
| Würtemberg Bible Society, 1812 | 2,254,172 |
| Zurich Bible Society, 1812 | 82,972 |
| Berg Bible Society, at Elberfeld, 1813 | 1,058,156 |
| Coire Bible Society, 1813 | 12,267 |
| St. Gall Bible Society, 1813 | 77,660 |
| Schaffhausen Bible Society, 1813 | 30,077 |
| Danish Bible Society, 1814 | 526,611 |
| Geneva Bible Society, 1814 | 147,232 |
| Hamburg-Altona Bible Society, 1814 | 266,416 |
| Hanover Bible Society, 1814 | 241,208 |
| Lausanne Bible Society, 1814 | 227,667 |
| Lübeck Bible Society, 1814 | 40,000 |
| Saxon Bible Society, 1814, at Dresden | 919,350 |
| Aargovian Bible Society, 1815 | 48,220 |
| Bremen Bible Society, 1815 | 103,029 |
| Brunswick Bible Society, 1815 | 6,312 |
| Icelandic Bible Society, 1815 | 10,445 |
| Netherlands Bible Society, 1815 | 2,151,820 |
| Schleswig-Holstein Bible Society, 1815 | 221,180 |
| Strasburg Bible Society, 1816 | 145,938 |
| Frankfort Bible Society, 1816 | 75,000 |
| Lauenburg-Ratzeburg Bible Society, 1816 | 34,165 |
| Lippe-Detmold Bible Society, 1816 | 42,955 |
| Neufchatel Bible Society, 1816 | 37,043 |
| Norwegian Bible Society, 1816 | 530,274 |
| Rostock Bible Society, 1816 | 25,000 |
| Waldensian Bible Society, at La Tour, 1816 | 4,238 |
| Berne Bible Society | 257,650 |
| Eutin Bible Society, for the Principality of Lubeck, 1817 | 15,000 |
| Hesse-Darmstadt Bible Society, 1817 | 33,271 |
| Waldeck and Pyrmont Bible Society, 1817 | 2,800 |
| Eisenach Bible Society, 1818 | 15,000 |
| Göttingen Bible Society, 1818 | 41,000 |
| Mulhausen Bible Society, 1818 | 61,071 |
| Hanau Bible Society, 1818 | 3,316 |
| Hesse-Cassel Bible Society, 1818 | 30,000 |
| Protestant Bible Society, at Paris, 1818 | 896,604 |
| Leipsic Bible Society, 1818 | 35,000 |
| Glarus Bible Society, 1819 | 5,000 |
| Ionian Bible Society, at Corfu, 1819 | 7,377 |
| Marburg Bible Society, 1819 | 25,165 |
| Colmar Bible Society, 1820 | 97,741 |
| Duchy of Baden Bible Society, 1820 | 114,995 |
| Anhalt-Bernburg Bible Society, 1821 | 7,802 |

| | Total Issues. |
|---|---|
| Weimar Bible Society, 1821 | 20,000 |
| Bavarian Protestant Bible Institution, at Nuremburg, 1823 | 458,344 |
| Stavanger Bible Society, 1828 | 7,017 |
| French and Foreign Bible Society, at Paris, 1833 | 750,000 |
| Antwerp Bible Society, 1834 | 439 |
| Belgian and Foreign Bible Society | 7,623 |
| Ghent Bible Society, 1834 | 8,980 |
| Anhalt-Dessau Bible Society, 1836 | 35,826 |
| Belgian Bible Associations, 1839 | 14,909 |
| Altenberg Bible Society, 1854 | 24,100 |
| Bible Society of France, 1864 | 558,149 |
| Russian Evangelical Bible Society, at St. Petersburg, 1831 | 1,025,467 |
| Imperial Russian Bible Society, at St. Petersburg, 1868 | 1,657,733 |

The British and Foreign Bible Society reported, March 31, 1890, a list of 3,279 auxiliary and branch Bible societies, the American Bible Society at the same date reported a list of 2,034, aggregating a total of 5,313 auxiliary and branch societies which are connected with those two parent societies, and whose names are not given in the foregoing list. The number of branch and auxiliary societies connected with other parent organizations cannot be given, as some of them have published no recent statistical reports. The Russian Bible Society, previous to its suspension by imperial ukase in 1826, had 289 auxiliaries. As most of the auxiliaries embraced in the figures given above report subordinate societies representing smaller territorial districts, it is estimated that the number of distinctive Bible organizations, including auxiliaries, in the world probably exceeds 10,000.

BIBLIOMANCY, a mode of divination much practiced during many ages by opening the Bible and observing the first passage that occurred, or by taking notice of the first words of the Bible heard after entering a place of worship. The application was often very fanciful. Prayer and fasting were sometimes used as a preparation for a mode of consulting the divine oracles, than which nothing could be more contrary to their purpose and spirit, and which was in harmony only with the notions and practices of heathenism. It was prohibited under pain of excommunication by the Council of Vannes, A.D. 465, and by the councils of Agde and Orleans in the next century. It continued, however, to prevail many centuries after, and was introduced into England at the Norman conquest. It was essentially the same as the *Sors Homerica* or *Sortes Virgilianæ*, the only difference being the book employed.

BIBLIOMANIA (from Gr. *biblion*, "a book," and *mania*, "madness") may be defined as a passion for collecting and hoarding rare or curious books. The last century and a half has witnessed a marked manifestation of this taste, both in Europe and in the United States. The bibliomaniac values books, not for their intrinsic worth alone, but for their scarcity, their age, their binding, and even for some grave blemish. Even a very common book takes on a fictitious value in the collector's eyes if it be the only known copy in existence, or be printed in black-letter, or have the stamp affixed of some long dead but famous binder. The formation of complete sets of such books, or of the works of a single author, provided they be rare, is a favorite pursuit with many. The editions of the classic writers most affected by collectors are the beautiful *Elzevirs* and the *Foulises*. Some of these have, at various times, brought fabulous prices. As much as £3,900 has been paid for a Mazarin Bible, and the first dated copy of Boccaccio's *Decamerone* (1471) was sold for £2,260. A psalter, printed by Füst and Schöffer in 1459, brought £4,950 at a sale in London in 1885. A copy of the Guttenberg Bible, in two volumes, printed in 1455, the first book printed from movable type, was purchased at the Brayton Ives sale in New York, March 14, 1891, by J. W. Ellsworth of Chicago, for $14,800. Such books as these are valued solely on account of their antiquity; works of a later date are prized on account of their beauty or fine workmanship. See BIBLIOGRAPHY, Vol. III, pp. 654, 655.

BICARBONATES differ from carbonates in containing twice as much carbonic acid. Bichromates, bisulphids and bitartrates are words formed on the same plan; but in recent chemical nomenclature the prefix *bi-* has been largely superseded by *di-*.

BICE, the name of two pigments, of a blue and green color respectively, known to artists from the earliest times. Both are native carbonates of copper, but are also prepared artificially. In its native state, however, bice is more durable, and in the case of green is especially much more brilliant. Artificial blue bice is known as Hambro blue, ongaro, mineral blue, etc.; artificial green bice, as mountain-green, Paul Veronese green, emerald green, verdetto, etc.

BICEPS, the muscle which gives a full appearance to the front of the upper arm. Above, it consists of two portions, or heads—whence its name—one being attached to the coracoid process of the scapula, the other to the margin of the depression in that bone which receives the head of the humerus. The former is the short, the latter the long, head of the biceps. They unite to form a fleshy muscle, which terminates in a rounded tendon. The biceps tendon is inserted into the tubercle of the radius. Before passing to this insertion it gives off an expansion, which separates the medium basilic vein from the brachial artery in the situation generally selected for venesection. The action of the biceps is rapidly to bend the forearm and also to supinate the hand. The straight muscle of the thigh is known as the *biceps cruris*. It has a corresponding use to the biceps of the arm.

BICESTER, a market town of Oxfordshire, Southern England, 12 miles N.E. of Oxford. There are manufactories of rope, clothing, sacking and pale ale, and several important fairs are annually held here. The ruins of Alia Castra, or Alcester, lie 1½ miles to the southwest, on the ancient Roman Akeman Street. Population, 3,500.

BICÊTRE, originally the name of a very old castle, in the neighborhood of Paris, commanding one of the finest views of the city, the Seine and the environs. It was destroyed in 1632, because it had become the hiding-place of thieves. It was rebuilt by Louis XIII, and made a hospital for old soldiers. Afterward it served as a prison for 2,000 culprits, mostly condemned to the galleys. After the erection of the Hôtel des Invalides, it was changed to a

lunatic asylum. It was here Piner brought about, in 1792, the first reforms in the care of the insane in France. Since 1890 it has been again changed into a refuge for the aged poor.

BICHROMIC CELL. See ELECTRICITY, § 103, in these Supplements.

BICKERSTAFF, ISAAC, an author of numerous comedies and light musical pieces, which had at one time a great popularity. He was born in Ireland in 1735. He became page to Lord Chesterfield, and was afterward an officer of marines, but was dismissed. Nothing is certainly known regarding his after life. His best known pieces are *The Maid of the Mill; The Padlock; He Would if He Could; Love in a Village; The Hypocrite;* and *The Captive.* Steele made use of the name *Isaac Bickerstaffe* as a pseudonym in writing many of the papers of the *Tatler.*

BICKERSTETH, EDWARD, an English clergyman; born in Kirby Lonsdale, Westmoreland, England, March 19, 1786; died Feb. 24, 1850, at Watton, England. He began life as an attorney, but afterward entered the ministry of the evangelical section of the Church of England; was a missionary to Africa and later secretary of the Church Missionary Society; one of the organizers of the Evangelical Alliance. He wrote *A Help to the Study of the Scriptures,* and a *Treatise on the Lord's Supper.* His complete works were published in 17 volumes in 1853.

BICKERSTETH, EDWARD HENRY, Bishop of Exeter, in the Church of England and poet; born in Islington, England, Jan. 25, 1825; the son of Edward Bickersteth (q.v., above); graduated at Trinity College, Cambridge; entered the ministry in 1848; made bishop in 1885. Has written *Rock of Ages* (1859); *Yesterday, To-day, and Forever* (1867); *The Hymnal Companion to the Book of Common Prayer* (1870); *Thoughts for To-day; From Year to Year* (1883); and many other poems and books of religious consolation and of sermons.

BICKMORE, ALBERT SMITH, naturalist and traveler; born in St. George's, Maine, March 1, 1839; was graduated at Dartmouth in 1860; studied under Agassiz; has made several collecting expeditions, with a special view to conchology, in the Malay Archipelago, China, Japan and Siberia; in 1870 became professor of natural history at Colgate University, and has divided his time since then between that institution and the New York Museum of Natural History in Central Park, of which museum he is acting superintendent. Among his published works are *Travels in the East Indian Archipelago; The Ainos, or Hairy Men of Yesso, Saghalien, etc.;* and *From Canton to Hankow.*

BICYCLE, AUTOMATIC. See AUTOMOBILE VEHICLES, in these Supplements.

*BICYCLE MANUFACTURE.* Few machines have been brought to so great perfection as the modern safety bicycle. Locomotive-building is coarse and ordinary in comparison, and watchmaking requires neither greater accuracy nor scientific knowledge of the materials and possibilities of machine-construction. An increase in racing speed of about 33 per cent, or roughly, from a mile in three minutes to a mile in two minutes, has been brought about in the bicycle within 18 years, solely by improved methods of construction and reduction of weight in the machines.

The bicycle of 1880 was a high-wheeled machine with rubber tires, imperfect bearings and a weight of about 50 or 60 pounds. The bicycle of 1896 weighs from 17 to 25 pounds, has pneumatic tires, ball-bearings throughout, and a frame of delicate thin steel tubes of marvelous rigidity. The pneumatic tire is most widely known as the latest notable improvement in the machines, but the improved methods of frame-construction which have made it possible to reduce the weight to such a trifling amount are even more remarkable from a mechanical point of view. The pneumatic tire is made of several thicknesses of canvas and rubber formed into an endless air-tight tube. It is held in place principally by the U-shaped form of the rim. Air is introduced through a valve, and it is necessary occasionally to pump in more air to maintain an inside pressure. The liability to puncture has been greatly reduced by improved methods of construction, and various cements are in use with which small holes, as from punctures by tacks, can be repaired.



MODERN SAFETY BICYCLE.

The most common method of making the tubes for the frame is to use mild steel drawn cold through dies to reduce the thickness and concentrate the metal. These tubes are divided into exact lengths, in machines designed for the purpose, that sever them with a clean, smooth cut. A recent method of making the tubes affords a further reduction in weight. For cold-drawn tubes it is necessary to use a mild steel which is not the stoutest quality, and as the tubes are not absolutely accurate as to thickness, safety requires a heavier tube than would otherwise be the case. In order to use a steel of greater strength, thus reducing weight, tubes have been made from strips of highest-grade rolled steel from .008 to .017 of an inch thick. These strips are twisted helically, somewhat like an old-fashioned paper lamp-lighter. The arrangement is such that there are two thicknesses at all points, and three thicknesses at points where the strain is greatest. These thicknesses overlap so that all the joints are covered. When the strips have been properly twisted into form around a mandrel, the edges are brazed, the spelter used being a special mixture found suitable for the purpose. This brazing stuff is run into the inside of the tube, and rubbed on the outside,

* Copyright, 1896, by The Werner Company.

being melted in by means of a gas-furnace, while the tube is turned and shaken in order that the spelter may work in thoroughly. The tube is then placed in powdered lime to cool, after which it is tested by striking it. If the ring is clear and melodious, the brazing is known to be perfect. The tests of tubes made in this manner show a marked gain in strength over the cold-drawn tubes. In a test of tubes of 1-inch diameter, weighing .371 pounds to the foot, the advantage of the helical tube was as 130 to 84 in tensile strength, while a strain of 942 pounds was required to bend and crack the helical tube against only 360 to buckle the cold-drawn tube.

In joining the frame of a bicycle the most approved practice is to use tees, elbows, etc., stamped to shape from sheet-steel, and molded by special tools in a press. This method permits the use of a good grade of steel. Another good process is to drop-forge the joints in solid metal, and bore them out in a special lathe having an adjustable jaw on the face-plate for holding the part to be bored at the desired angle against a drill fixed in a center. The cavities for the ball-cups are then shaved out by another special machine with a single cut.

For hubs and crank-boxes a blank is usually formed of bronze or mild steel, and stamped to a close approximation of its form before going to the lathe to be finished. Hardened steel adjustable raceways are made for the balls that reduce friction in the bearings. The essential point in the design of these raceways is to secure three accurate points of contact for the balls. To insure a true surface they are ground with emery after turning in the lathe.

For the spokes, what is known as piano-wire was generally used until the demand became so great that the wire-makers began to draw a special bicycle-wire of very tenacious steel. For straight spokes, these wires are upset or thickened on the end, so as not be weakened by threading. The rim end is often simply spread, to prevent its drawing through its hole. Tangent spokes, which are usually a trifle smaller in diameter, are commonly attached to the rim by a nipple, and to the hub by a head. Hickory spokes have been used with good results, though they are heavier for the same strength than the steel.

Rims are generally made of selected hickory. In second-grade wheels they are often made in one solid thickness. The ordinary method of manufacture for the hollow rim is to take two suitable strips of rolled steel and roll them into a U-section, the outer U or tread being more shallow and of thinner steel than the inner U, which is called the block. These strips are then made into circular form by means of bending rolls. The edges of the strips are then lapped and brazed, an operation requiring a great deal of skill, as unless the work is perfect there are likely to be undue strains, which will ultimately cause the rim to buckle if put into use. Electric welding has been tried for this joining with marked success, and is being used to a considerable extent. Machinery for making jointless rims was introduced in 1896. The advantages of a jointless rim are, that it is easier to produce them in uniform sizes, and there is a more equal tension of the metal. The heat of brazing being also avoided, the metal is not softened. In the new process a square sheet of steel is stamped into the form of a tin pan, the bottom of the pan cut away, and the rim turned over and shaped by spinning in a lathe. An enormous press fully 15 feet high, weighing 35 tons, and costing several thousand dollars, has been designed specially to stamp out these pan-like blanks. The cutting out of the center is done in a lathe having a pair of rotating shears mounted on a slide-rest. The bending of the solid ring to U-form is accomplished by means of various spinning lathes in successive operations until the edges are sufficiently turned to form the U-section. The spinning-tool is usually brought up against the work by a slide-rest, and the tool is recessed to the shape required of the ring.

The drilling of the block or inner side of the rim, for the purpose of making spoke-holes, is accomplished by a very ingenious machine. The block is set outside of a braced frame which is expansible, within certain limits, to accommodate several sizes of rim. The whole is bolted to a dividing-wheel, controlled by a pawl and ratchet. The drill is run up against the rim on a slide-rest and a hole made. The pawl then turns the dividing-wheel one tooth, and the rim turns a certain distance, securing absolutely accurate spacing between the holes. A machine operating on similar principles is used to drill the hubs, a holding-lever steadying the work, while cams push the drills in and out.

Steering-bars are commonly made of hollow steel drawn very thin, and rendered conical on the end by hammering with a steam-hammer. Some makers fill the bar with a powder jammed in tight, and then bend it cold into form, the interior powder preventing any distortion of the shell.

The steering-fork is made in several parts, the crown being formed of stamped pieces of sheet steel brazed together, or sometimes turned from a drop-forging. The sides of the fork are flattened and tapered by special machinery. Cold swaging is the method usually employed. The swaging-machine has a heavy rotating head, within which eight hammers are made to deliver a multiplicity of light blows on the tubing, so that its diameter is rapidly reduced to any desired taper. After tapering, the fork-tubes are flattened and bent to the proper curve.

The cranks are ordinarily drop-forged from spring steel. After being formed they are subjected to a slight tempering, so as to increase their strength. Too much tempering would make them brittle, and they are required to bear a test-strain of about six hundred pounds, and to withstand occasional bending through accident. The slotted hole in the crank is milled out. Cranks are usually attached to the crank-shaft with a key, and the shaft is flattened or squared to form a grip for the key, the latter being tempered to extreme hardness, as it is subjected to great pressure.

Some makers build the forward sprocket in one piece with the crank, an arrangement which adds to the rigidity of the parts. The sprocket is usually separate, however, and it is found desirable to make it in two pieces, the rim being bolted to the spider,

as the piece forming the hub and arms is called. The sprocket is then screwed on to its shaft in such a manner that the strain of the chain tends to tighten it in place. For accurate finishing of the sprocket-teeth a milling-machine is used, and a number of sprockets may be milled at one operation.

Chains are made with rivets of soft steel, because if the rivets were hardened they could not be spread at the ends to hold them in place. As a consequence there is rapid wear in a bicycle-chain, and the rider has to tighten it up occasionally. This is obviated in some degree, by some manufacturers, by using hardened steel sleeves around the rivets. In this case the rivet, sleeve and hole are all made of D-section, so that they will not turn, all the slipping being in the hole of the next link.

Ball-bearings are used all over the bicycle, the total number of the balls being often 150 in a single machine. The tendency is to use larger balls than formerly, as more reductive of friction. Felt washers are used alongside the balls in the hub to keep out the dust.

The fitting together of the tubes and joints of a bicycle-frame is accomplished by setting up the parts in a massive jig or templet, set-screws being used to hold the pieces in proper position while being brazed. The operation of brazing, or soldering with brass, has been greatly improved within a few years, and the joints so made are now as strong as any other part of the bicycle. Borax and zinc are used to assist the brazing, and the mixture used is termed spelter. The parts to be brazed are heated in a special form of furnace, and the molten brass is run into all the crevices so thoroughly that the result is a perfectly solid connection. Each tube must be accurately fitted, and each part absolutely trued before brazing, because the most trifling error in fit is liable to skew the frame, so that when the wheels are put in they will not "track," that is, follow on the same path. There will be a tendency of the machine to drift to one side, and it will run hard unless the wheels are perfectly in line. After brazing, the frame is cooled and washed in acidulated water to remove the borax. The filer next takes the frame and smoothes up the joints, taking extreme care not to weaken them. All the parts that are to be enameled or nickel-plated have to be polished, first with a coarse emery-wheel, then with a fine emery-wheel, and lastly with a rotating emery-brush, using putty. They are then thoroughly cleaned and rubbed with rottenstone, or tripoli powder, and washed, after which they are ready for the galvanic bath. After nickel-plating it is customary to rub the parts with sawdust and a pasty cloth.

The assembling of the parts of a completed bicycle requires patience and care. Though the parts are made with the greatest regard for accuracy, yet there are always minute differences, which the fitter-up must adjust. Every part must run easily before it leaves the shop, and when an assembled machine runs hard, the fitter-up must find out just where the difficulty lies and remedy it.

Every piece and part of a high-grade bicycle is subjected to most severe tests and scrutiny before being used. The sheet steel comes in in batches to the testing-room. One piece in each lot is subjected to tortional strains, to see if it is of the required strength, and at what point it will twist or become permanently distorted. Another piece is strained lengthwise to test its tensile strength, and another tested for compression, until the examiner is satisfied that the whole lot is up to the required standard. If it is not up to the proper grade, the batch is thrown out. Many finished parts are subjected to the same sort of treatment to learn whether any have been unduly weakened in the processes of manufacture.

In making bicycles of a cheap grade these testing operations are omitted. Malleable iron is also substituted for the hubs, cones, etc., emery-grinding is omitted, and less care is exercised in the details of construction.

Numerous devices have been patented for enabling bicycle-riders to secure more power for hill-climbing than when riding on the level. It is obvious that lengthening of the cranks or reduction of the chain-gear will afford more power with a commensurate loss in speed. A device that will enable the rider to effect one of these changes automatically, or with slight effort and without dismounting, has been eagerly sought. At the New York bicycle show in 1896 there was exhibited what was called a bi gear mechanism, operated by a push-and-pull handle at the side of the saddle, or by a trigger from the handle-bar. This affords an instant change of gear, and promises to supply the want.

A few of the improved machines introduced in 1896 should be noted in closing. Among these may be mentioned a triangular frame wheel, having the saddle and handle-bar both at the apex of the triangle. The construction saves a pound or two of material, and may be useful in racing-machines.

A folding bicycle, having a frame that may be slipped and unhinged at the center so as to fold up. The hinging device adds only a pound to the weight.

A military bicycle with a Colt 40-pound automatic gun mounted between the handles. The gun has a pistol-handle, and is set on a little turntable. There is only one barrel, but it is capable of delivering a hundred shots in 16 seconds from a belt of cartridges. The recoil is said to be very light.

CHARLES H. COCHRANE.

BICYCLE RAILWAYS. The term *bicycle railway* is a misnomer, being applied to railways which use a central supporting-rail, regardless of whatever other rails may be used. A number of such systems have been devised, none of which have come into commercial use. Those which have attracted the most attention are the Boynton and Brott systems.

A two-mile experimental road was equipped at Belleport, Long Island, in 1893, and a public trial given on Feb. 16, 1894. Notwithstanding the short track, a speed of 50 miles an hour was shown. The motive power used was steam, and the locomotive rested on drivers on a single central track, and was maintained in an upright position by an overhead rail, against which the flanges of overhead steadying-wheels might impinge.

A 30-mile road on the Brott system is projected

between Washington, District of Columbia, and Chesapeake Bay, and another is proposed in the vicinity of Minneapolis, Minnesota. A central supporting-rail is used, this being laid upon the ground. Side rails are laid on stringers at a height of about five feet, and on these side-wheels may rest occasionally, as the car sways in travel. The cars are long, and pointed at the ends to reduce wind-pressure. A half-story for baggage is located below the passenger-apartment. The motive power is electricity, and the General Electric Company of New York has announced that it is prepared to furnish motors, generators and other electrical equipment for such a road, warranting them to maintain a speed of 150 miles an hour when delivering a hundred horse-power per motor, with two motors per car. The electric motors designed for this system are of the gearless type, operating directly upon the axle, one on each side. The electric current will be taken on the trolley principle, though it will be necessary to substitute a sliding mechanism in place of the trolley-wheel, which will not deliver a very powerful current. The conducting-wire will be run under the cars, and will carry a current of 1,000 volts. The three-phase alternating system will be used.

While it must be admitted that great speed is possible on a railway specially constructed for the purpose, and using electric power, engineers are not yet agreed that the bicycle system offers the best solution. Their construction is as yet so experimental that it is not possible to pass authoritatively upon their merits. C. H. COCHRANE.

BICYCLES, in law, are vehicles, and are entitled to the use of public streets and highways in the same manner as other vehicles. In England the courts have decided that bicycles are within the Highways Act, prohibiting furious driving, but in this country, generally, the ordinances of the various cities provide special laws regulating the manner in which bicycles may be used on the public streets and as to the necessity of lamps, bells, or whistles. Outside of cities in this country, there are usually no special laws affecting the use of bicycles, but the riders are subject only to the general laws holding all persons responsible for their careless acts in case of injury resulting therefrom, and to the laws concerning the use of public highways.

BIDA, ALEXANDRE, a French artist; born at Toulouse in 1823; died in Paris, Jan. 3, 1895. He was a pupil of Delacroix. He became a member of the Legion of Honor in 1855, and an officer of the Legion in 1870. Among his principal works are a series of designs, in two volumes, illustrating the evangelists, and a water-color painting, *The Massacre of the Mamelukes*, the property of the Metropolitan Museum of Art, New York.

BIDAR, a city in the Nizam's dominions, Hyderabad state, British India, near the right bank of the Manjera, a tributary of the Godavery, 75 miles N.W. of Hyderabad. Formerly a place of importance, it is now remarkable chiefly for its manufactures in a compound metal made of tin, copper, lead and zinc, and called bidderyware. This industry has been of late declining. The district of Bidar has an area of 4,884 square miles, and a population of 800,000.

BIDASSOA, a small river in Spain, forms 33 miles of boundary between Spain and France, and falls into the Bay of Biscay at Fuenterrabia. The Treaty of the Pyrenees was concluded on the Isle of Pheasants, at its mouth, in 1659. On its banks were fought, in 1813, several battles between Wellington and Marshal Soult, the best known being that of San Marcial, where the French troops were defeated by the allies.

BIDDEFORD, a city of York County, southwest Maine, opposite Saco Falls, on the Saco River, 6 miles from the ocean, and 15 miles S.W. of Portland. The city has an abundant supply of pure water; is well lighted with gas and electricity; has an electric fire-alarm and street-railways, and excellent schools. The high school building, erected in 1888 at a cost of $50,000, is one of the best in the state. Superior granite is found in the vicinity in inexhaustible quantities. The Lincoln monument, at Springfield, Illinois, is built of this granite. Biddeford was first settled in 1616; incorporated as a town in 1718, and as a city in 1855. Population in 1890, 14,443.

BIDDING-PRAYER, a form of exhortation, always concluding with the Lord's Prayer, enjoined by the fifty-fifth canon of the Anglican Church in 1603, to be used before all sermons and homilies. Except in cathedrals and the university churches, it is now seldom used. The term is from the Anglo-Saxon *biddan*, "to pray," so that bidding-prayer is really pleonastic; but after the sixteenth century the word *bidding* came to be popularly regarded as an adjective, or *bidding-prayer* as a compound,—a prayer which directs what is to be prayed for. The form is of extreme antiquity, and was anciently used for the communicants or believers after the dismissal of the catechumens and was pronounced by the deacon, each petition beginning with the words, "Let us pray for," etc.

BIDDLE, CLEMENT, "Quaker soldier"; born in Philadelphia, May 10, 1740; died there, July 14, 1814. His parents were Quakers, and he was brought up with much strictness. In 1764, Mr. Biddle, at the head of a company of Quakers and others, repelled a force of desperadoes, known as the "Paxton Boys," and from that time was active in all military actions of the day. He was a soldier of the Revolutionary war, and present at the battles of Princeton, Germantown, Brandywine and Monmouth. He was a personal friend of General Washington. He attained the rank of colonel in the army, and was afterward quartermaster-general and marshal of Pennsylvania.

BIDDLE, JAMES, naval officer; born at Philadelphia, Feb. 28, 1783; died there, Oct. 1, 1848. He entered the navy and saw service on board the *Philadelphia* and *Wasp*, and was commander of the captured *Frolic*. He was made prisoner near Tripoli, while on board the wrecked *Philadelphia*, and just after receiving command of the *Frolic*, the ship and crew fell into British hands. On being exchanged, Captain Biddle's rank was raised and he was given command of the *Hornet*. He captured the *Penguin*, and then sailed for the Cape of Good Hope. He had a narrow escape from a British ship-of-war, which fol-

lowed so closely that he had to throw his guns overboard. On returning to New York many honors were bestowed on him for his fine seamanship and gallant conduct. Subsequently he saw much active service, commanding the Mediterranean squadron in 1831, and in 1845 the East India squadron, which sailed to China to make a treaty with that country. He acted for the United States in the Oregon boundary question in 1818, and negotiated a treaty with Turkey in 1826.

BIDDLE, NICHOLAS, naval officer; born at Philadelphia, Sept. 10, 1750; killed in action, March 7, 1778. At the age of 13 he made a voyage to the West Indies. In 1770 he entered the British navy, but deserted his ship three years later to go with Captain Phipps on an Arctic expedition. On his return he had gained sufficient experience to fit him for the command of a vessel and he was placed in charge of the *Andrea Doria*. From this time to his death Captain Biddle was extremely fortunate in his engagements with British ships. He captured two crusiers off Montauk Point, two transports and several merchantmen near Newfoundland, and four ships near Charleston, South Carolina. On March 7, 1778, while cruising in the latter vicinity with a fleet of five vessels (his own being the *Randolph*), he fell in with the *Yarmouth*, a heavily armed British vessel. In the action which ensued the *Yarmouth* sustained severe injuries and the *Randolph* was blown up. Biddle and 310 of his crew perished. Captain Biddle's death was a great loss to the navy of the young republic.

BIDDLE, NICHOLAS, financier; born at Philadelphia, Jan. 8, 1786; died there, Feb. 27, 1844. He was a precocious youth, and could have graduated at the University of Pennsylvania at the age of 13. He graduated from Princeton in 1801, standing at the head of his class. He went abroad as secretary to John Armstrong, minister to France; was directed to audit and pay claims against the nation, using the purchase-money of Louisiana; was secretary for Mr. Monroe when he went as minister to Great Britain. In 1807 he returned home and practiced law, giving his leisure to literary pursuits. He was assistant editor of the *Portfolio*, and prepared the report of Lewis and Clark's expedition to the mouth of the Columbia River from their notes. In the legislature, to which he was elected in 1810, he originated an educational bill which was so far in advance of the times that it could not be passed till 1836, when a bill similar to it was carried through both houses. Mr. Biddle was largely influential in rechartering the United States Bank. He was appointed a government director, and later president of the bank. A panic followed the order of the Secretary of the Treasury to withdraw the United States funds. The bank failed, and Biddle, with others, was criminally prosecuted. By commission from President Monroe, he prepared and published his *Commercial Digest*, which was for many years an authority on matters of international trade regulations. Later he became president of the Stephen Girard College fund, and planned and executed the general scheme of that charitable institution of learning.

BIDDLE, RICHARD, lawyer and author; born in Philadelphia, March 25, 1796; died in Pittsburg, July 7, 1847. He was a brother of Nicholas Biddle; received a classical and legal education and practiced law in Pittsburg. In 1827 he went to England, and while there published his *Review of Captain Hall's Travels in North America*. Returning, he was twice elected to Congress as a Whig, from the Pittsburg district, serving from 1837 to 1840 when he resigned. His most important literary work was *Memoir of Sebastian Cabot, with a Review of Maritime Discovery*.

BIDWELL, JOHN, statesman; born in Chautauqua County, New York, 1819. In 1829 his parents removed to Pennsylvania, and in 1831 again removed to Ashtabula County, Ohio, where he was educated, at Kingsville Academy. During the winter of 1838–39 he taught school in Darke County, and subsequently for two years in Missouri. In 1841 he emigrated to California, being one of the first to make the journey overland, which at that time occupied six months. On the Pacific Coast he had charge of General Sutter's Feather River possessions. He served in the Mexican War until its close, rising from second lieutenant to major. He was among the first to discover gold on Feather River in 1848. In 1849 he was a member of the state constitutional convention, and during the same year became a member of the senate of the new state. He was one of a committee appointed to convey a block of gold-bearing quartz from California to Washington in 1850. Since then he has been brigadier-general of the state militia. In 1864 he was elected to Congress, and served until March, 1867. He was a delegate to the national convention of his party in 1866. In 1875 he was a candidate for governor of California, but was defeated. In 1892 he became the nominee of the Prohibition party for President of the United States, receiving 268,361 votes from the people, but not securing any votes in the electoral college.



JOHN BIDWELL.

BIEBRICH. See BIBERICH, in these Supplements.

BIEDERMANN, ALOYS EMANUEL, German theologian; born at Oberrieden, March 2, 1819; died at Zurich, Jan. 25, 1885. He was educated at Berlin, became professor of theology at Zurich, where he remained from 1850 until his death. He published *Die Freie Theologie; Kirche der Gegenwart;* and *Christliche Dogmatik*.

BIEDERMANN, FRIEDRICH KARL, German writer and journalist; born in Leipsic, Sept. 25, 1812; in 1838 appointed professor of philosophy in Leipsic; lost his position on account of his political opinions as expressed in the *Deutschen Annalen*, and was also imprisoned. He was reinstated in 1852; lost his position, and again reinstated in 1865. His liberal views led him into politics. He edited several liberal papers, among them the *Deutsche Allgemeine Zeitung*. His published writings include *Wissenschaft und Universität; Vorlesungen über Social-*

*ismus und Sociale Fragen; Die deutsche Philosophie von Kant bis auf Unsere Tage*, etc.

BIELA'S COMET, named for its discoverer, Baron Wilhelm von Biela (1782–1856) of Roslau, Prussia. See COMET, Vol. VI, p. 192.

BIELAYA OR BIELAIA, a river of eastern Russia, one of the main tributaries of the Kama, which in turn flows into the Volga. It finds its source in the Ural Mountains, and takes a winding course of over 600 miles.

BIELOZERO, a lake of northwest Russia, in the department of Novgorod; empties into the Volga by the Sheksra River; 20 miles wide and 25 miles long. Its name signifies the "White Lake," so called on account of the milky appearance of its waters, caused by the white clay bottom.

BIELZY, a manufacturing town in Bessarabia, southwest Russia, about 150 miles N.W. of Odessa. It is noted for an annual fair which is held there. Population, about 6,000.

BIENNE, LAKE, a body of water 10 miles long by from 1 to 3 wide, situated in Berne, near the foot of the Jura Mountains, 3 miles N.E. of Lake Neufchatel. It lies at an elevation of 1,419 feet, and its greatest depth is 400 feet. It is famous for inclosing the island of St. Pierre, where J. J. Rousseau lived in 1765. In the southeastern part of the lake, the submerged, prehistoric remains of a village of lake-dwellers have been found. At its northern end is the important city of Bienne, or Biel, containing the rich Museum Schwab (antiquities). The population of the city is about 15,000. Its chief industry is watchmaking.

BIENNIALS, plants which do not blossom the first season of their growth, but flower and bear fruit in the second season, and then die. Plants which in ordinary circumstances are biennials often become annuals when early sowing, warm weather, or other causes promote the earlier development of a flowering stem. If, on the other hand, the flowering of the plant is prevented, or in many cases if it is merely prevented from ripening its seed, it will continue to live for a much longer period.

BIENVILLE, JEAN BAPTISTE DE, governor of Louisiana; born in Montreal, Feb. 23, 1680; died in France in 1768. With his brother, Lemoine d'Iberville, he undertook an expedition in 1699 to the mouth of the Mississippi. In 1701 he became director of the colony established by D'Iberville, and moved its capital from Biloxi to Mobile. He was accused of misconduct and discharged, but was reinstated in 1718 by Law, and in 1723 moved the headquarters to New Orleans, which city he had founded in 1718. In 1736, 1739 and 1740 he made unsuccessful expeditions against the Chickasaw Indians, in consequence of which he was removed, and he returned to France in 1743. He published a code which regulated the condition of slaves, prohibited every religion except the Roman Catholic, and banished Jews from the colony; this remained in force until Louisiana was purchased by the United States.

BIERSTADT, ALBERT, artist; born in Düsseldorf, Germany, Jan. 7, 1830. His taste for art was early shown, as he made excellent crayon sketches in his youth, and at the age of 20 had begun work in oils. Three years later he went from New Bedford, Massachusetts, where he had been brought up, to his birthplace, spending four years in the study of art, and then going to Rome to further prosecute his studies. In 1857 he returned to America, making an extensive tour through the West, where he obtained material for many subsequent paintings. He has three times visited Europe, and has had many honors conferred upon him, both at home and abroad. Bierstadt is famous for his pictures of mountain scenery. *Laramie Peak; Looking Down the Yosemite; Valley of the Yosemite; In the Rocky Mountains;* and *California Oaks*, are among his best-known works. His *Discovery of the Hudson River* is in the national capitol. He received the decoration of the Legion of Honor in 1867. In 1860 he was elected a member of the National Academy.

BIERVLIET, a village of the Netherlands, province of Zealand, 13 miles N.E. of Sluis. It was the birthplace of William Beukels, who, in 1386, invented the method of curing herrings. In 1377 Biervliet was detached from the mainland by an inundation and still remains insular. Population, about 2,000.

BIES-BOSCH, a marshy sheet of water of the Netherlands, between the provinces North Brabant and South Holland, southeast of Dordrecht, formed, in November, 1421, by an inundation which destroyed 72 villages and 100,000 people. It forms that part of the estuary of the Maas called Holland's Diep, and contains a large number of small islands.

BIFROST, in Norse mythology the "tremulous bridge" that connected heaven (Asgard) and earth, or, according to some, hell (Hela); it is the many-colored bridge—the rainbow—which the Asas, or gods, built. In the later accounts of the myth the warriors of Muspelheim (the land of fire) ride over the bridge to give battle to Odin; the wolf Fenrir, the Midgard serpent, Loki and all the followers of the infernal regions unite in the war against the heavenly gods, who all come forth to battle with the evil spirits. The bridge breaks down, and the powers of evil triumph.

BIGA, a term used by the Romans to apply to vehicles drawn by two horses abreast. In shape it resembled the Greek war-chariot—a short body on two wheels, low and open behind, where the charioteer entered, but higher and closed in front.

BIGAMY. See BIGAMY, Vol. III, pp. 668, 669. In the United States the principal points of difference between the laws of the various individual states are as to whether the offense is indictable in the state in which the ceremony of marriage takes place, or in that in which the bigamous parties actually cohabit, and further, as to whether a ceremonial marriage must be established at all. Otherwise, the general principles of the common law hold good. See also DIVORCE and MARRIAGE, in these Supplements.

BIG BETHEL, a locality in York County, Virginia, about 10 miles N.W. of Fortress Monroe. It was the scene of an engagement, June 10, 1861, in which a body of Union troops, being sent by Gen-

eral Butler to dislodge a detachment of Confederates commanded by General Magruder, was repulsed, with the loss of about 100 in killed and wounded. The objective point of the Federal troops was Little Bethel; but a portion of the command, having gone to the rear of the enemy's works to cut off his retreat, was mistaken for the enemy and fired upon by the main body, thus disclosing their purposes to the enemy, who hastily withdrew to the better fortified position at Big Bethel. Here continued attempts were made to carry the works by assault, but without success, and the Union troops, under General Pierce, withdrew. The Confederates, fearing reinforcements, decamped during the night.

BIG BLACK RIVER, an affluent of the Mississippi, which it enters at Grand Gulf. It rises in Choctaw County; is about 200 miles in length, and is navigable for about 50 miles. Its banks were the scenes of important military operations in connection with the taking of Vicksburg in 1863. At a bridge crossing the river about 15 miles east of that city, the Union forces, under General Grant, carried the works of the Confederates, under General Pemberton, May 17th, capturing all on the east side, and driving those on the west bank to their final retreat within the defenses of Vicksburg.

BIG BONE LICK, a saline spring in Boone County, Kentucky, about 12 miles S. of Burlington. It is noted for the numerous bones found here of the mastodon and other extinct animals, which are believed to have come to "lick" the salty earth and to have perished in the then marshy soil.

BIGELOW, Erastus Brigham, born at West Boylston, Massachusetts, April 2, 1814; died at Boston, Dec. 6, 1879. His father, a cotton-weaver, intended he should study medicine, but Erastus turned his attention to invention. In this field, toward which he had a peculiar bent, he was successful. Among his inventions were a hand-loom for suspender-webbing (1834); an automatic loom for weaving fine counterpanes (1838); a loom for weaving coach lace, and power-looms for the weaving of two-ply ingrain carpets, tapestry and tapestry-velvet carpets (1845), which enabled the manufacturer to weave figures of any description into carpets and to space and match them accurately. He did much to further the prosperity of Clinton, Massachusetts; was one of the principal manufacturers there; a writer on the protective tariff; author of a work on stenography, and a member of the Boston Historical Society.

BIGELOW, Frank Hagar, an American astronomer; born at Concord, Massachusetts, Aug. 28, 1851. He graduated from Harvard in 1873, and later studied at the Episcopal Theological School at Cambridge, Massachusetts. He was assistant to Dr. B. A. Gould at the national observatory at Cordoba, Argentine Republic, and in 1877 he was engaged at the Naval Observatory, Washington, District of Columbia. He next engaged in preaching, but on account of his health, abandoned the calling, and returned to Cordoba in 1881, staying two years, after which he went to Racine, Wisconsin, where he remained six years as professor of mathematics and astronomy in the college there. In 1889 he became an assistant in the *Nautical Almanac* office at Washington, District of Columbia, and in 1891 was appointed to the newly created office of professor of meteorology in the United States Weather Bureau. He has invented an instrument for the photographic record of the transit of stars, and is an advanced student of terrestrial magnetism and astronomy. His monograph on the *Solar Corona* was published by the Smithsonian Institution in 1889.

BIGELOW, Jacob, born at Sudbury, Massachusetts, Feb. 27, 1787. He was graduated at Harvard in 1806. Becoming a famous botanist, he was chosen as one of a committee of five to compile the *American Pharmacopœia.* He had an extensive correspondence with scientific men of Europe, several of whom named plants in his honor. For 20 years he was physician of the Massachusetts General Hospital; for 40 years professor of *materia medica* in Harvard, and from 1816 to 1827 held the Rumford professorship in the college. For many years he was president of the Massachusetts Medical Society and of the American Academy of Arts and Sciences. Dr. Bigelow was interested in educational work, and labored for the establishment of technical schools. He contributed articles to magazines and wrote several books, some of which were *Florula Bostoniensis* (1814); *American Medical Botany* (1817); *Elements of Technology;* and *Nature in Disease* (1854). He died at Boston, Jan. 10, 1879.

BIGELOW, John, an American editor and author; born at Malden, New York, Nov. 25, 1817. He was graduated at Union College (1835), and practiced law in New York. He left the law and entered journalism. He edited *The Plebeian* and the *Democratic Review;* was inspector of Sing Sing prison; partner with William Cullen Bryant in the *Evening Post;* minister to France (1865–67); secretary of the state of New York (1867–68); made an honorary member of the New York Chamber of Commerce (1886), for which he inspected the Panama Canal. He has published a *Life of Frémont; Life of William Cullen Bryant, France and Hereditary Monarchy; Les États-Unis d' Amérique en 1863* (Paris), and other works.



JOHN BIGELOW.

BIGELOW, Melville Madison, an American author; born at Eaton Rapids, Michigan, Aug. 2, 1846. He was graduated at the University of Michigan in 1866; and studying at Harvard, received there the degree of Ph.D. In 1879 he lectured at the Boston University law school. He has made several compilations on legal matters of much value in the profession, and among his more general works are *Treatise on the Law of Estoppel, and its Application to Practice* (1886); *Leading Cases in the Law of Torts* (1875); *The Law of Fraud and the Procedure Pertaining to the Redress Thereof* (1877–79); *Placita Anglica-Normannica; Law Cases from William I*

*to Richard I* (1879); *History of Procedure in England from the Norman Conquest: The Norman Period* (1880); *A Treatise on the Law of Fraud* (1888).

BIGG OR BIG, a local name for the six-rowed winter barley (*Hordeum hexastichon*) grown in northern Europe, especially in Scotland. The common or four-rowed barley (*Hordeum vulgare*) is called "bear" or "bere" in Scotland and North England.

BIGGAR, a town of Lanarkshire, 28 miles S.W. of Edinburgh, with which it has connection by rail. The Collegiate Church of St. Mary was founded here in 1545. Of Boghall Castle, in the vicinity, the seat of the great Fleming family, hardly a vestige remains. Dr. John Brown, author of *Rab and His Friends*, was born in the United Presbyterian manse of this place, and John Gladstone (1693–1756), great-grandsire of W. E. Gladstone, is buried in the churchyard. Population, 1,556.

BIGGAR, JOSEPH GILLIS, an Irish politician; born at Belfast in 1828; was elected to Parliament as a Home Ruler in 1874, and on April 22, 1875, he introduced, in contending against the Peace Preservation Bill, the tactics that became known as "obstruction," by engaging the attention of the House for four hours in reading and commenting on the evidence taken by the Westmeath Commission. He was an active supporter of Charles Stewart Parnell. He was twice prosecuted for sedition and conspiracy, but escaped imprisonment by exiling himself in Paris for a period. He was one of the original treasurers of the Land League. He died in London, Feb. 19, 1890.

BIGGLESWADE, a market town of Bedfordshire, on the river Ivel, 41 miles N.W. of London by rail. It is a well-built town; the chief industries are the manufacture of lace and straw plait. It is a great coal and grain market. Population, 4,947.

BIG HATCHIE, a river of southwestern Tennessee, rising in Tippah County, Mississippi, flowing northeast into Tennessee, then turning northwest and flowing into the Mississippi, 40 miles above Memphis. Length, about 140 miles. It is navigable at certain seasons for river boats for half its length. Its valley is very fertile.

BIG HORN, a navigable river of the United States, and the largest affluent of the Yellowstone, rises near Frémont's Peak, in the Rocky Mountains, in the northwest part of Wyoming. Its course is first southeasterly, then north through the Big Horn Mountains into Montana, until it reaches the Yellowstone. Its total length is about 550 miles.

BIGHORN (*Ovis montana*), a species of mountain sheep, a native of the Rocky Mountains. Its large spiral horns are often four feet long and six inches in diameter at the base. It is extremely wary and agile. See SHEEP, Vol. XXI, p. 785.

BIGHT, in nautical language, the loop or turn of a rope. Thus one anchor may "hook the bight" of the cable of another, and thereby cause entanglement. In geography the term *bight* has much the same significence as "bay."

BIGNON, LOUIS PIERRE EDOUARD, a French statesman and historian, born at La Meilleraye, Jan. 3, 1771. He held diplomatic appointments in Austria; and after the battle of Waterloo became Minister of Foreign Affairs; was elected to the Chamber of Deputies in 1817, and created a peer in 1837. His works include *A History of France from the Eighteenth Brumaire to the Peace of Tilsit* (1829–30); *History of France under Napoleon, from the Peace of Tilsit to 1812* (1838). Napoleon bequeathed to him one hundred thousand francs, with instructions to write a history of French diplomacy from 1792 to 1815. He died in Paris, Jan. 5, 1841.

BIGNONIA, a genus of American tropical and subtropical plants giving name to the family *Bignoniaceæ*. It includes many very handsome climbers, in the tropics frequently reaching the tops of the tallest trees, and bearing beautiful bell-shaped flowers. The most northern species, *B. capreolata* of the southern United States, is frequently cultivated.

BIGNONIACEÆ, a family of dicotyledonous plants, generally with compound leaves. The flowers are showy, and are among the most striking ornaments of tropical forests. The corolla is of one petal more or less trumpet-shaped and irregular, the stamens are five in number and unequal, the ovary is free, seated on a disk, one to two celled, the fruit sometimes capsular, sometimes drupaceous. There are numerous species, in many cases noble trees, some of them affording valuable timber. The fleshy sweet root of *Craniolaria annua* is preserved in sugar as a delicacy by the Creoles. The best known genera are *Bignonia*, *Tecoma* (trumpet-vine or trumpet-creeper) and *Catalpa*.

BIGORRE, a mountainous district in the southwestern part of France, formerly belonging to Gascony, but now for the most part embraced in the department of Hautes-Pyrénées. Tarbes has been the chief town since the days of the Romans. See BAGNÈRES-DE-BIGORRE, Vol. III, p. 235.

BIG RAPIDS, capital of Mecosta County, northwestern Michigan, on the Muskegon River, about 55 miles N. of Grand Rapids. It is an important lumber market, and has an extensive water-power and numerous manufactories of shingles, lumber and furniture, besides a number of mills and machine-shops. Population 1890, 5,303.

BIG SANDY RIVER, also called CHATTERAWAH, an affluent of the Ohio, formed by the junction of the Tug Fork and West Fork, each about 160 miles long, which unite at Louisa, Kentucky, and empties into the Ohio at Catlettsburg, 18 miles N. of Louisa. The Tug Fork rises in West Virginia and forms part of the boundary between that state and Kentucky. The West Fork rises in the southwest part of Virginia and flows through Kentucky. Including the West Fork, the Big Sandy is navigable for about 100 miles from its mouth.

BIG SPRING, capital of Howard County, western Texas, on Giraud's Creek, and on the Texas and Pacific railroad. It is well provided with churches and schools; it has railroad-shops, and is in the center of a stock region. Population 1890, 1,158.

BIHACH, one of the strongest fortress towns of Croatia, European Turkey, situated on an island in the Una, near the frontier of Dalmatia. It has been the scene of frequent contests during the Turkish wars. Population, 3,000.

BIHAR, a county in the west-central part of Hungary, with an area of 4,279 square miles. It is mountainous in the east, and has barren heaths and marshes in the west. The western part has many small rivers. Wheat, wine and tobacco are largely produced. The population of the county is about 520,000. The chief city is Grosswardein, with a population of about 30,000.

BIJBAHAR, next to the capital the largest town of Cashmere, situated on the banks of the Jailum, about 25 miles to the southeast of the metropolis, in lat. 33° 47′ N., and long. 75° 13′ E. A feature worthy of notice is a wooden bridge across the Jailum, which, notwithstanding its simplicity and fragility, has endured for centuries.

BILANDER, a small two-masted merchant vessel, distinguished from others chiefly by a peculiar shape and arrangement of the lateen mainsail. These vessels, which were probably of French origin, are used chiefly on the canals of the Low Countries.

BILBERRY, a name applied to the fruit of several species of *Gaylussacia* and *Vaccinium* of the family *Ericaceæ*. The genera are found in the north temperate latitudes of both hemispheres. In the northern United States and Canada the fruit are extensively used under the names *huckleberries*, *blueberries*, *whortleberries*. The original "bilberry" is *Vaccinium Myrtillus* of Europe. In Scotland the bilberry is called *blaeberry*, from its *blae* or dark blue color. See WHORTLEBERRY, Vol. XXIV, p. 556.

BILBILIS, an old Iberian city of Spain, two miles E. from Calatayud, in the province of Saragossa, celebrated as the birthplace of the poet Martial; also famed for its highly tempered steel blades. Under the Romans it was a municipal town with the surname Augusta.

BILBOES, long bars or bolts of iron with shackles sliding on them and a lock at one end. When an offender on shipboard is "put in irons," it implies that bilboes are fastened to him, more or less ponderous, according to the degree of his offense. The bilboes clasp the ankles as the handcuffs clasp the wrists.

BILE, secretion of the liver. See NUTRITION, Vol. XVII, p. 675; DIGESTIVE ORGANS, Vol, VII, p. 231.

BILHARZIA (*Distomum hæmatobium*), a genus of flukeworms (*Trematoda*) parasitic in the human bladder, mesentery and blood-vessels, especially portal veins. Contrary to the rule, the sexes are separated in these flukeworms. The animals are associated in pairs, the smaller female living in a groove on the ventral surface of the male. These worms are common in Africa, and often produce serious inflammations of the organs which they inhabit. See TREMATODA, Vol. XXIII, p. 540.

BILIMBI OR BILIMBING, the native name of the fruit of *Averrhoa Bilimbi*, or East Indian tree-sorrel, of the family *Geraniaceæ* (*Oxalideæ*). It is very acid, but is much used in various preserved forms.

BILIN, a town of Bohemia, beautifully situated in the valley of the Bila, and famous for its mineral springs, the waters of which it exports to the extent of 500,000 jars annually. It has two castles, and in its vicinity there is a remarkable isolated clink-stone rock, called Biliner Stein. The Tripoli earth, or Bergmehl, found at Bilin has been shown to be the remains of infusoria. It has manufactories of cotton yarn. Population, about 6,000.

BILL OR GISARME, a weapon of warfare used in England and on the Continent before the introduction of firearms. It was a kind of battle-ax having a blade shaped somewhat like a sickle, to which a drawing movement was given in striking.

BILLARDIERA, a genus of twining Australian shrubs of the family *Pittosporaceæ*. They have simple alternate evergreen leaves, and axillary pendulous flowers. The flowers have a calyx of five sepals, and a bell-shaped corolla of five petals. The fruit is a soft, spongy pericarp with inflated cells, and is called "apple-berry." It is edible, though not destitute of a resinous character, which prevails in the order.

BILLET, in military parlance the assignment of troops to temporary quarters while on the line of march. Houses of public entertainment are generally first listed, but in time of war the residences of private citizens are equally amenable. (See BILLETING, Vol. III, p. 674.) In America immunity is secured to the inhabitants of any place through whose territory troops may be passing by a special clause in the Bill of Rights, but this is operative only in times of peace. In England and parts of Europe, during the annual military manœuvers, the billet is practically enforced "by request," and it is seldom refused. The attempted enforcement of the Billeting Act was one of the chief causes of the Revolution.

BILLET, an ornamented molding. See ARCHITECTURE, Vol. II, p. 461.

*BILLIARDS. For early history and European practice, see BILLIARDS, Vol. III, pp. 674–677. In recent times numberless improvements have been made in the construction of billiard-tables, and the skill of American manufacturers now leaves nothing further to be desired. In the fifties the tables generally in use in America were 6 by 12 feet, with six pockets. The style of game during that period resembled English billiards, consisting of caroms and hazards, differing, however, so far as losing hazards were concerned. In the American game no losing-hazards were permitted. The player pocketing his own cue-ball forfeited to his opponent. After a while the size of the table was reduced to 5½ by 11 feet, with only four pockets. It was while the latter style was in use that crotching or jawing the balls became a feature of the game. But even this size of table was found to be too large, and in the early seventies the 5-by-10-foot carom-table was introduced, and this has now become the standard size for expert amateurs and professional players in America, although there are tables 4 by 8 feet and 4½ by 9 feet, the latter size being at present in general use at public rooms and clubs, and private houses. The variations in the size of the table have not been the only important alterations in the *matériel* of the game in this country. The cushions are undoubtedly one of the principal

* Copyright, 1896, by The Werner Company.

elements of a billiard-table, and *The Handbook of Rules of Billiards* (1896) in referring to cushions, says:

"Previous to 1850 the cushions in general use were made of rags or layers of list or cloth, which presented a rounded surface for the ball to string against and then rebound with a jump. In England raw gum cushions had been introduced as long ago as 1835, and later they found their way into this country, but they met with so little favor that they were soon abandoned. A so-called inventor of the raw gum cushion also patented in this country an air-pipe cushion of thin vulcanized rubber, which had to be filled or pumped full of air, similar to the old-fashioned rubber life-preservers; but because of the great height of these cushions, the ball being well hid when it touched or lay under the cushion, they also became unpopular. Various attempts were made with rubber and cloth to invent an acceptable billiard-cushion, but all these attempts invariably met with failure. The first solid rubber cushion was produced in 1850, in the shape of a strip of vulcanized rubber, which was nailed to the cushion-rail, it being believed at that time that rubber could not be glued to wood so as to remain fixed. These rubber strips were beveled with a knife and then rasped down to a true face. An improvement was made upon this method of cutting the rubber, by beveling a piece of wood and securing it to the rubber strip; by holding the knife against the bevel, the knife would cut through the rubber; then by another cut of the same rubber through, using the same wood-bevel, a diamond-shaped strip would be produced, with face and back beveled alike, and this was the origin of the diamond-shaped rubber cushion of to-day.

"In 1855 Michael Phelan returned from a residence of about a year in California, and brought with him ideas for the construction of a combination cushion of rubber, leather and cork, the cork being first used on the face of the rubber to prevent the ball from sinking into the rubber, thus forming a shoulder to resist the ball, which caused an acute angle in the rebound of the ball. It was found that the cork when used with the rubber alone would crumble through the constant pounding of the balls against the cushion, and then a piece of leather was laid over the cork to hold this cork substance in position, and the great Phelan and Seereiter match of 1859 was played upon a table fitted with these cushions. Steel-faced, whalebone-faced, corded-edged and canvas-faced cushions were also invented about this time by various manufacturers, but they in turn became unpopular and were abandoned. Finally, hard rubber was introduced to the face of the elastic vulcanized rubber cushions, and these, with various improvements, were in use for some years, until they were superseded by the cushion now generally preferred by all the leading professional and amateur players, in which the face of the cushion is comparatively solid, which prevents the ball from imbedding itself in the rubber, the elasticity being at the back, yet both face and back are in fact one substance."

There have also been changes in the material used for the bed of the table. In the earliest history of the game the beds were made of wood; first stone, then marble was substituted, to be finally followed by slate, which is in use at the present time. While the two styles of tables (6 by 12 feet and 5½ by 11 feet) were the rule, four balls were always used, but when the 5-by-10-foot carom-table without pockets was introduced, three balls only were allowed in all match games between the leading experts. But it is still customary among amateurs in many sections of the country to play the four-ball carom game on all tables. With the arrival of the carom-table the style of game changed, yet it was soon discovered that the expert professionals could make records at straight-rail billiards that rivaled some of the long, tedious runs when crotching and pushing and hazards were the rule. Different schemes were suggested to make the game more difficult and retain the interest of the public. Balk-lines, as they were termed, were established, and rules framed by which the players were limited to a certain number of shots whenever the object-balls were within the restricted spaces between the cushions and the lines drawn on the bed of the table. The balk spaces were first fixed at 8 inches, but were afterwards increased to 12 and finally to 14 inches, where they remained until the year 1896, when, in tournaments held in New York City and Chicago, the lines were extended to 18 inches. The manner in which the balk spaces are formed is to draw a line, at whatever distance is determined, from the short rail at one end of the table, running parallel with the long rail until it ends at the short rail at the opposite end. The same process is then repeated at the short rails. Lines are drawn from side to side of the long rails, running parallel with the short rails. The result is, that eight spaces are formed, four being oblong and four (where the lines cross at each corner) being square. While the player is limited with all styles of balk line (up to and including 14 inches) to two shots within the lines, he is free from any restriction when the object-balls are in the large open space in the center of the table.

As soon as the balk-lines became a fixed fact there was a veritable craze to introduce new systems of playing carom-billiards. One plan was to inaugurate a game by which the table was to be divided into four equal spaces, and another proposed to draw lines from the center diamonds on the long rails to the center diamonds on the short rails. A space game by which the table was split into six sections was another idea. What was called the champions' game, with lines 14 by 28 inches, was projected early in the eighties, and about the same time match games were played with lines 18 by 38 inches and 20 by 40 inches. These variations in the style of play all tend to show the desire to produce a game which will be satisfactory to the public, and at the same time produce the best results from a

billiardistic standpoint. The remarkable skill shown by two or three players, however, caused another change to be made. What is known as the "anchor-shot" was invented by Jacob Schaefer. This consisted of bringing the two object-balls together, one on either side of a balk-line, where the latter touched the rail, and by delicate manipulation keeping the spheres in that position almost indefinitely. Schaefer first used this shot to advantage in a match with Frank C. Ives at Chicago, in November, 1893. The following month, in a three-handed tournament at New York City, between Ives, Slosson and Schaefer, the latter, in the last game of the series, made the phenomenal run of 566, largely through the anchor-nurse, and averaged 100 in a game of 600 points at 14-inch balk-line on a standard 5-by-10 table. This completely eclipsed all previous records. The same three players named met in Chicago, in a tournament in January, 1894, and in the second night's game Ives ran 487 and reached the average of 100. But the spectators at these games exhibited such dissatisfaction with the anchor-shot that at the suggestion of Slosson it was abolished after the second night's play. Charles J. E. Parker, the manager of the tournament, introduced at this point an anchor-balk, consisting of lines drawn 3½ inches on each side of the balk-lines where they touched the rails, forming a boxlike space in which the player was allowed to make but ten shots, when the balls had to be driven out of balk. These anchor spaces were retained in public contests, at 18-inch balk-line, which took place in New York City and Chicago during April and May, 1896, but the number of shots permitted in balk was reduced. At New York City the player was allowed to make one shot in the anchor-balk, driving the balls out on the second shot. At Chicago the player could not make even one shot within the prescribed space. He had to bring the balls out as soon as they were declared in, not only within the anchor space, but within the large 18-inch balk-lines. This virtually abolished the anchor-shot.

*On Rules.* The institution of the carom-table also gave rise to games by which the cushions were largely utilized to exemplify particular forms of billiards. The most noticeable games of this class are single-cushion caroms and three-cushion caroms. Rules that were established for cushion caroms during a tournament at New York City several years ago defined this game thus: "A cushion carom is made by the cue-ball taking one or more cushions before effecting a carom, or by the cue-ball making a carom, then either object-ball." This theory of a cushion carom has, however, by almost universal consent, been abandoned. A cushion carom is now conceded to be effected when the cue-ball has struck the first object-ball, gone to a cushion and then hit the second object-ball. According to this law it is not permissible to make a carom from ball to ball, and for the cue-ball then to pass to a cushion and return to either object-ball, and accomplish a valid shot.

The rules regarding three-cushion caroms provide that the cue-ball must strike three distinct cushions, or at least one cushion three times, before a three-cushion carom can be scored. Another game is known as bank-shots. This is a very difficult style, and is rarely played, except by the most advanced experts. In this game the cue-ball must strike at least one cushion before it meets an object-ball.

The rules of the old four-ball game of billiards, when pockets were in the tables, were so complex in their character that the simpler code provided by the players in the international tournament for the championship of the world at the three-ball carom game held at New York City from June 23 to 30, 1873, was hailed with delight by every one interested in billiards in America. These rules were arranged by Francis Ubassy, Joseph Dion, Cyrille Dion, Maurice Daly, Albert Garnier and John Deery. H. W. Collender presided over the deliberations of this committee, and I. Gayraud officiated as secretary. This tourney is memorable from the fact that it practically abolished the six-pocket and four-pocket games, and brought caroms prominently before the billiard world. In the new style a carom counted one for the player, and a miss one for his opponent. This was a startling and radical innovation upon the old-style billiards practiced up to that time. The four-ball pocket style of billiards graded the different shots. A carom off the two reds had its particular value; so with a red and a white. Thus some idea can be formed of the old-style game by the manner in which it was counted; and the change which the strictly carom game produced can be readily appreciated by comparison of the two methods.

But even at this period (when the framers of the rules for this famous tourney had not the slightest idea of balk-line, or any thought that that system would control billiard-playing in America a few years afterward), one of the rules provided for the tournament of 1873 virtually instituted a balk space of 4½ inches square at either corner of the table, and the player was allowed to make only three caroms within the designated space. This provision was made to prevent crotching the balls in the corners of the table. In 14-inch balk-line billiards the player is required to get the balls out of the balk spaces on the second shot.

Among other games that are in vogue may be mentioned "red, white and blue," which is played upon an ordinary billiard-table with three balls, colored respectively red, white and blue, and three pins of corresponding colors. "The Little Corporal" is the regular three-ball carom game; with a small pin added (like those used in pin-pool), and which is set up in the center of the table. The caroms and forfeits count as in the regular three-ball game, but the knocking down of the pin scores five points for the striker. One hundred points generally constitute a game. "Bottle pool," "two-pin pool," "bouchon" or "French pool," "Parisian pool" (La Barraque),

and "Chicago pool," are all included in the list of games that are played, and the number might be materially increased from those specified. The game of "bottle-pool" has lately attracted considerable attention. A leather bottle is placed in the center of a six-pocket table, and the player strives to carom from one of the object-balls in use against the bottle, which, if overturned, permits the player to count. Caroms are also counted. The game is played with three balls, two white and one red.

*Events.* During the past three or four years an effort has been made to awaken the interest of the American public in the old-style English game, but the movement has not met with success. Frank C. Ives and John Roberts engaged in matches at a composite game in London and at Chicago. The first match took place in London, England, early in 1893. In the regular English game the balls are $2\frac{1}{16}$ and pockets $3\frac{5}{8}$ inches, but this was changed to $2\frac{1}{4}$ inches for the balls and $3\frac{1}{4}$ inches for the pockets. Ives won by the following score: Ives 6,000; Roberts, 3,821 In this game Ives made a run of 2,540. Roberts and Ives met a second time in a six nights' contest at Central Music Hall, Chicago, from Sept. 18 to 23, 1893, 1,000 points each night. It was at the same modified form of the game, larger balls and smaller pockets than the English use. Ives won, 6,000 to 5,303.

The most important event in America in late years, however, has been the struggle for the world's championship at 14-inch balk-line. This title, and the accompanying trophy, was first won by Jacob Schaefer, who defeated George Slosson in New York City in 1890. The two experts played several matches for the emblem, until in March, 1892, Frank C. Ives and Schaefer met at the Central Music Hall, Chicago, Illinois, and Ives won. On May 2, 1892, Ives defeated Slosson for the same trophy, and became the recognized champion at 14-inch balk-line billiards. Schaefer challenged the champion, and the latter, who had gone to Paris, France, to fill an engagement as a billiard expert at one of the French academies then existing, designated Paris as the city where the game should be played. The rules gave Ives the right to name the city, and Schaefer left America and went to Paris to meet him. The two players could not agree upon a hall where the contest should be decided, and at last, on behalf of the donors, Mr. M. Bensinger, who was in Paris at the time, withdrew the emblem and thus terminated the struggle.

BENJ. A. MACDONALD.

BILL IN EQUITY is a complaint filed in a suit in equity, containing a statement of the facts upon which the complainant relies, together with a prayer for the relief sought. It is said to be an original bill when the matter in controversy has not before been the subject of litigation by the same parties, standing in the same relation; and a bill not original when it is supplemental to or in some way depending on or relating to an original bill. Crossbills, bills of review and bills to set aside or impeach a decree are bills not original. See BILL, Vol. III, p. 673.

BILLINGS, a small railroad town of Christian County, southwestern Missouri, distant 261 miles from St. Louis, on the St. Louis and San Francisco railroad. The Southwestern Christian College and the Christian Colony are located here. It has manufactories of flour, plows and wagons. Population 1890, 464.

BILLINGS, capital of Yellowstone County, south-central Montana, on the north bank of the Yellowstone River, about sixty miles above the mouth of the Big Horn, and on the Northern Pacific railroad. It is an important wool market, and the shipping-point for the stock-ranges of the surrounding country. Artificial irrigation is rapidly extending the area of cultivated land in the vicinity. Population 1890, 836; 1895, 1,500.

BILLINGS, JOHN SHAW, an American surgeon; born in Switzerland County, Indiana, April 12, 1838. He was graduated at Miami University in 1857, and at Ohio Medical College in 1860, being next year appointed acting assistant surgeon in the army. In 1863 he joined the Army of the Potomac, and was present at the battles of Gettysburg and Chancellorsville. From December, 1864, he was attached to the surgeon-general's office in Washington, and in 1876 he was appointed surgeon, with the rank of major, in the regular army. He is medical adviser of Johns Hopkins Hospital and lecturer on municipal hygiene at Johns Hopkins University. In 1884 he received the degree of LL.D. from the University of Edinburgh, Scotland. He has published many reports upon the hospitals, barracks, army hygiene, and upon the mortality and vital statistics of the United States. His great work is, however, his *Index-Catalogue of the Library of the Surgeon-General's Office*, which aims to give the bibliography of every subject so far as found in that library, and was commenced in 1880, and published in twelve volumes (1892). He also published a *Bibliography of Cholera* (1875); *Medical Bibliography* (1883); and *The Principles of Ventilation and Heating* (1884).

BILLINGS, JOSH. See SHAW, HENRY W., in these Supplements.

BILLINGS, SIGISMUND, a French soldier; born at Calmar, Alsace, in 1773. He entered the French army as a boy, and early in the war of the Revolution distinguished himself, particularly at the battle of Jemapes. He worked actively on the downfall of the empire in accomplishing the abdication of Napoleon, and kept watch, as commander of a legion of the national guard, over the Chamber of Deputies during the discussion which resulted in its decreeing the emperor's forfeiture of his crown. Before his death he was identified with Lafayette in the revolution of 1832, which resulted in the elevation of Louis Philippe to the throne.

BILLINGSGATE. See LONDON, Vol. XIV, p. 829. The term is also used to denote coarse and abusive language, such as was used in Billingsgate fish-market.

BILLINGTON, ELIZABETH, a celebrated English singer, was born in London in 1769. She was the daughter of a German musician named Weichsel. She early came forward as a performer on the piano and as a composer, appearing at Oxford in 1783, and two years later, having married her music teacher, Thomas Billington, she appeared with brilliant success on the opera stage in Dublin in 1786. She perfected her musical education under Sacchini in Paris. In 1793 she visited Italy, winning great fame at Naples in *Inez de Castro*, Biancho's masterpiece, which had been specially written for her. She appeared subsequently in Venice and Rome, and retired from the stage in 1811. She resided in England until 1817, when she retired to her villa at St. Artien, near Venice, and died there in 1818.

BILL OF ADVENTURE, a writing by a merchant, ship-owner or master to show that goods shipped by him on board a certain vessel are the property of another, whose adventure or chance the transaction is, he himself being responsible only for their delivery. Generally, in commercial law, an adventure may be said to be a speculation in goods shipped under the care of a supercargo, to be disposed of by him to the best advantage for the benefit of his employers.

BILL OF CREDIT, a letter authorizing a third party to give credit to a second on account of the first. It is known as a special bill of credit if the third party is specifically addressed, and as a general bill if addressed indefinitely to any who may see fit to give the bearer the credit proposed. The term, as used by the constitution of the United States, which prohibits the emitting of bills of credit by any state, is construed to mean paper issued by a state on its mere faith and credit to be circulated as legal tender.

BILL OF EXCEPTIONS is a statement in writing, to be used in an appellate court upon appeal or writ of error, which contains the objections to the rulings of the court upon questions of law. It must contain all of the objections to rulings which the party taking the appeal relies upon as being erroneous, and must be signed by the judge or court before whom the case was tried, and the seal of the court attached. The objections may be that the court has misdirected the jury, or refused, upon request, to properly instruct the jury, or that it has improperly admitted or rejected evidence. All exceptions must be taken at the time the ruling is made, but usually the bill is not made up and signed by the judge until afterward, at some time set by the court. A bill of exceptions, when signed and sealed, is conclusive evidence as to the facts included in it as between the parties to the suit.

BILL OF EXCHANGE is a written order made by one person upon another, directing that he pay to a third person a certain sum named. The person making the order is called the drawer; the one upon whom it is drawn, the drawee; or after acceptance, the acceptor, and the one to whom the money is ordered to be paid, the payee. The drawee does not become liable upon the bill until he has accepted it, which is usually done by writing his name with the word *accepted* or other equivalent words, upon the bill, after which he is liable in like manner as the principal upon a promissory note. It may be accepted conditionally, in which case his liability is subject to the conditions. If the payee indorse the bill and transfer it, his liability is the same as an indorser upon a promissory note. After acceptance the drawer does not become liable to the payee or indorsee except upon the failure of the acceptor to pay. A foreign bill of exchange is one where the drawer and drawee are residents of different countries, and in the United States where they are residents of different states. Inland bills of exchange are where they are residents of the same country or state. Foreign bills of exchange must be protested for failure of the drawee to accept, which entitles the payee or holder to an action against the drawer for the amount of the bill and damages, while inland bills need not usually be protested, to make the drawer liable. A bill of exchange must state the amount, time of payment, date, etc., definitely and must always be in writing. A bill of exchange payable on demand is commonly called a draft. The different states generally regulate the manner of collecting bills and the liability of the various parties by statute, but they are usually governed by rules much the same as apply to promissory notes. See BILL, Vol. III, p. 673.

BILL OF HEALTH, a certificate signed by a consul or other authority, delivered to the master of a ship at the time of clearing from a port or place suspected of being subject to infectious disorders, certifying the state of health at the time that such ship sailed. A clean bill imports that at the time the ship sailed no infectious disorder was known to exist. A suspected bill, commonly called a touched patent or bill, imports that there were rumors of an infectious disorder, but it had not yet appeared. A foul bill, or the absence of a clean bill, imports that the place was infected when the vessel sailed.

BILL OF LADING was, at common law, the writing containing the contract between the owner or master of a vessel and the owner of goods which the vessel was to carry from one port to another for a certain freight rate. In this country the term is also applied to written contracts made between a carrier by land and the shipper or owner of goods to be carried. It partakes of the character of a contract and also of a receipt, and is generally assignable, and will carry with it the title to the goods, subject to liens and to the shipper's right, in some cases, to stoppage *in transitu*. Bills of lading are in general use between the railroad companies in this country and those who ship goods over the railroads. See BILL, Vol. III, p. 673.

BILL OF MORTALITY, a return of the deaths, within a certain district, specifying the diseases, and giving a progressive view of the age at death.

BILL OF PARTICULARS, in legal proceed-

ings, is a statement made by a plaintiff, or by a defendant who sets up a counterclaim or set-off, in which he states particularly the facts and items of his claim and the manner in which they arose. The object is to advise the adverse party as fully as may be necessary of the items of the claim, so as to prevent surprise at the trial. The necessity of filing a bill of particulars depends upon provisions of the statutes in the various states, but is generally required in that class of cases wherein the pleadings are not required to be explicit, or to show the facts sufficiently to fully apprise the other party of the claim made. In such cases the court may generally require a bill of particulars, upon request being made. In some states it is necessary to file a bill of particulars in such cases when the suit is begun.

BILL OF SALE is an agreement in writing, and under seal, transferring the title to personal property. It implies a warranty of the vendor's title to the property, even if not expressly stated. Bills of sale are in general use as security for debts, in which case possession of the goods is frequently retained by the vendor, and sale annulled upon payment of the debt. But when the vendor retains possession, a bill of sale is void as to creditors without notice thereof, when the vendor has not property sufficient to pay his creditors, unless it be properly recorded, and in many states is even then void.

BILLOM, a town of France, in the department of Puy-de-Dôme, situated on a hill 14 miles E.S.E. of Clermont. It is one of the most ancient towns in Auvergne, and was formerly surrounded by walls, which have now disappeared. In 1455 a university was founded at Billom, which passed into the hands of the Jesuits a century later, and was governed by them until the suppression of their order. It has manufactories of fine pottery. Population, 4,166.

BILLON, an alloy, one part of silver to three of copper, which is used in some countries, as in Austria, for the smaller denominations of money. See NUMISMATICS, Vol. XVII, p. 630.

BILLROTH, CHRISTIAN ALBERT, an Austrian surgeon; born at Bergen, in the island of Rügen, April 26, 1829, his family being of Swedish extraction. He studied at Greifswald, Göttingen and Berlin, taking the degree of doctor of medicine at the latter place in 1852. He assisted Professor Langenbeck in Berlin for some years, after which he was appointed to the chair of surgery at Zurich in 1858, and to the same chair at Vienna University in 1867. He achieved fame as one of the boldest and most skillful operators, and military surgery owes much to his persevering attention in the alleviation of suffering. His experience of military surgery during the Franco-Prussian war led him to advocate strongly the abolition of war. He founded a school of hospital nurses and planned the model hospital in Vienna consisting of isolated small buildings. In conjunction with Professor Pitha he wrote a *Handbook of General and Special Surgery*. He died Feb. 6, 1894.

BILNEY, THOMAS, an English martyr; born about 1495, probably at Norwich. He studied at Trinity Hall, Cambridge, and was ordained in 1519. He was opposed to the formality of the schoolmen and denounced saint and relic worship, converting a number of young Cambridge men, among whom was Hugh Latimer, to his views. In 1527 he was arraigned before Wolsey, and recanting, was absolved, but was nevertheless confined in the Tower of London for more than a year. Some time after his release, being overcome with remorse for his faithlessness, he began to preach in the fields of Norfolk, but was soon apprehended and condemned; and although allowed to receive the sacraments of the church, from which he really differed but little, he was burned as a heretic at Norwich, Aug. 19, 1531.

BILOXI, a town in Harrison County, southeastern Mississippi, on the bay of the same name, 80 miles E.N.E. of New Orleans. It has a railroad, a convent, an iron lighthouse, and is a summer resort. Its oyster trade is second only to that of Baltimore, and a large business is done in canning fruits and vegetables. Population 1890, 3,234.

BILSON, THOMAS, an English prelate, born in Winchester in 1636 and educated at the school of that place. He was admitted, in 1565, perpetual fellow of New College, Oxford, and became prebendary of Winchester in 1576, bishop of Worcester in 1596, and was translated to Winchester the following year. In 1585 he published *The True Difference between Christian Subjection and Unchristian Rebellion*, a work directed against the Catholics and meant as a vindication of the interference of Queen Elizabeth in favor of the Protestants of the Low Countries. This he followed in 1593 with *The Perpetual Government of Christ's Church*, which is considered a masterly argument in favor of Episcopacy. In 1604 appeared his *Survey of Christ's Sufferings for Man's Redemption and of His Descent to Hell for Our Deliverance*, which was a reply to a criticism of a former published series of sermons by himself. To him was intrusted, by King James I, the care of putting the last touches to the authorized version of the Bible, in which work he was assisted by Dr. Miles Smith, afterward bishop of Gloucester. He died in London June 18, 1616.

BIMA OR BODJO, a seaport in Sumbawa, one of the Sunda Isles, where a Christian school is maintained. Its chief exports are horses and timber. See SUMBAWA, Vol. XXII, p. 641.

BIMANA (Latin, " two-handed "), a term first employed by the Göttingen anatomist Blumenbach (1752–1840) to describe the human species alone. The separate order thus designated was recognized by Cuvier and by most of his contemporaries and immediate successors. It has since been shown, however, that man differs less from the anthropoid apes than these apes do from most monkeys, and the term *Bimana* is now rarely used, man being included with apes, monkeys, and lemurs in the old Linnæan order, *Primates*. See MAMMALIA, Vol. XV, p. 444.

BIMETALLISM. See *Conflict of Standards* under MONEY, Vol. XVI, pp. 735–738, and FINANCE, in these Supplements.

BIN, JEAN BAPTISTE PHILIPPE ÉMILE, a French painter, born at Paris, Feb. 10, 1825. He entered the School of Fine Arts in 1842 and continued his studies with M. Leon Cogniet, receiving the second prize at Rome in 1850 for his subject *Zenobia Found on the Shores of the Araxes.* Upon his return from Rome he commenced to exhibit at the Salon in 1861, and among his works are *Atalante and Hippomenes* (1864); *Persée et Andromède* (1865); *Hercules Become Mad, Slaying his Children and their Mother, Megara* (1866); *Prométhée Enchaîné* (1869); *Vénus Astarté* (1874); besides which he produced a series of portraits of public men, and has decorated a large number of famous public and private buildings. He entered politics and was mayor of the arrondissement of Montmartre, but resigned his office in 1889. He has obtained several medals and has been decorated with the Legion of Honor.

BINAB, a town of Persia, in the province of Azerbijan, beautifully situated on the banks of the Sofi Chai, in the midst of orchards and vineyards, 55 miles S.SW. of Tabriz. The streets are very clean, many of them having a stream of pure water flowing down the center. Population, about 10,000.

BINARY SYSTEM. See ASTRONOMY, Vol. II, p. 818.

BINASCO, a town of Lombardy, Italy, 11 miles N.W. of Pavia. It is defended by a castle, where, in 1418, Beatrice di Tenda, wife of the Duke Filippo Maria, was beheaded by order of her husband. Population, 1,340.

BIN-BIR-KILISA, the name of extensive ruins in the pashalic of Karamania, Asia Minor, 20 miles N.N.W. of Karama. The ruins consist chiefly of the remains of Byzantine churches, evidently of great antiquity, and some of considerable size. It is supposed to be the ancient Lystra, where the cripple was healed by St. Paul.

BINCHE a town of Belgium, on the Haine, 10 miles from Mons. It is well built and walled with a fine square ornamented with a fountain. It has manufactories of leather, cutlery, glass, etc., and a trade in lace, paper, marble and coal. Population, 9,865.

BINDRABAN, a town on the right bank of the Jumna, in the district of Muttra, India, 823 miles to the northwest of Calcutta, and 92 miles to the south of Delhi. Superstition seems to be the principal business of the place; crowds of pilgrims come from all parts of India, more particularly in honor of Krishna, and through the munificence of wealthy devotees sacred edifices are constantly becoming more numerous and costly. Here, as at Benares, the immediate margin of the river is occupied by flights of steps; these extend for about a mile along the bank, and are constructed of red stone brought from Jeypore, nearly 150 miles distant. Population, 21,550.

BINGHAM, JOHN A., an American politician; born in Mercer, Pennsylvania, in 1815, became a lawyer, and was elected to Congress from Ohio as a Republican in 1854. He sat in the House from 1855 to 1863, then became judge-advocate in the army, and in 1864 solicitor of the court of claims. As special judge-advocate he took part in the trial of Lincoln's assassins. He returned to Congress in 1865, and sat until 1873, and was one of the managers of the impeachment proceedings against Andrew Johnson. For 12 years from May, 1873, Mr. Bingham was United States minister to Japan.

BINGHAMTON, capital of Broome County, southern New York, situated on the north branch of the Susquehanna River, where it is joined by its tributary, the Chenango River, 215 miles N.W. of New York. The Delaware, Lackawanna and Western and the New York, Lake Erie and Western railroads intersect at Binghamton. The city is supplied with water from the Susquehanna River by the Holly system. The courthouse is a handsome edifice, modeled after St. Paul's in London, and contains a county law library. The New York State Asylum for Inebriates, having failed in the experiment of reforming inebriates, is now used as a state asylum for the chronic insane. The Binghamton Academy; a Roman Catholic academy; parochial school; the Susquehanna Valley Home; a refuge for orphan children; and St. Mary's Home for Indigent Children, are among the educational and charitable institutions. The city has over 700 manufacturing establishments, doing a business of about fifteen million dollars annually. It was founded by William Bingham in 1787, incorporated as a village in 1818, and became a city in 1867. Population 1880, 17,317; 1890, 35,005.

BINNEY, AMOS, an American naturalist; born in Boston, Oct. 18, 1803. He graduated at Brown University in 1821, and engaged successfully in commercial pursuits, but devoted himself afterwards to science, being the first president of the Boston Society of Naturalists, and president of the American Association of Naturalists and Geologists until his death, when the association was merged in that of the American Association for the Advancement of Science (q.v., in these Supplements). He was a member of the state legislature, and in this capacity did much to promote the study of the natural history of the state, with special reference to animals and insects injurious to crops and fruit trees. His wealth enabled him to prosecute his favorite study successfully, engaging special exploring parties and artists in the preparation of his work, *The Terrestrial and Air-breathing Mollusks of the United States and Adjoining Territories*, which appeared from 1847–51, after his death, under the direction of Dr. A. A. Gould. He died at Rome, Feb. 18, 1847.

BINNEY, HIBBERT, a Canadian churchman; born in Nova Scotia, Aug. 12, 1819, educated at King's College, London, and at Oxford University, where he graduated in 1842 with honors. He became a fellow of Worcester College; returned to Nova Scotia in 1851, and was consecrated fourth bishop of Nova Scotia—the first

Anglican diocese in Canada (founded in 1787). He died in 1887.

BINNEY, HORACE, an American jurist; born in Philadelphia, Pennsylvania, Jan. 4, 1780; died there, Aug. 12, 1875. After graduating with high honors at Harvard in 1797, he studied law, and was admitted to the bar in 1800. He soon became a leader in cases before the higher courts of Pennsylvania, and practiced also in the United States supreme court. He opposed President Jackson's administration, and was elected to Congress in 1833, serving one term, and he was a trustee in closing the affairs of the United States Bank, in which he had been a director. His most important case was the defense of Philadelphia, in 1843, before the United States supreme court, against the heirs of Stephen Girard (*Vidal* v. *The Mayor of Philadelphia*). His argument is exhaustive and final, and is an authority on the law of charitable uses. After this brilliant triumph he retired from practice in the courts. He refused a nomination to the United States supreme court, offered by President Tyler, and declined many judicial posts. Mr. Binney in early life contributed to Dennie's *Portfolio*, and published *Reports of Cases in the Supreme Court of Pennsylvania from 1799 to 1814; The Leaders of the Old Bar of Philadelphia* (1859); *An Inquiry into the Formation of Washington's Farewell Address*, opposing the claim made for Alexander Hamilton as its author (1859); *The Privilege of the Writ of Habeas Corpus under the Constitution*, maintaining the President's power to suspend the writ without the authority previously given from Congress (1862), and elaborated in 1865; many addresses and legal pamphlets; and eulogiums of Chief Justice Tilghman (1827); of Chief Justice Marshall (1836), and of Hon. John Sergeant (1852). His son Horace (1809–70) was a lawyer of ability and a prominent citizen of Philadelphia.

BINNIE, ALEXANDER R., an English civil engineer; born in London in 1839. He was educated at private schools, and was a pupil of J. F. La Trobe Bateman, F.R.S., the famous engineer. In 1868, Binnie, by open competition, entered the service of the public works department of India, and was engaged in the explorations which led to the discovery of coal in the central provinces. He successfully designed and conducted the works for the supply of water to the city of Najpur. For both of these works he received the thanks of the government of India. He was engaged in other public works in India, and returned to England in 1874, when he was appointed corporation engineer for Bradford, a position that he held for 15 years, during which period he constructed the highest reservoir embankment, 125 feet, in the United Kingdom, and an extension to the waterworks in the Nedd valley, at a cost of $6,250,000. He was also engineer to the London County Council, in which capacity he designed and superintended the construction of a tunnel under the Thames at Blackwall (q.v., in these Supplements), work proceeding from both shores. He received the Telford medal from the Institute of Civil Engineers for a paper on the water-works in Najpur. He is president of the Bradford Philosophical Society.

BINOCULAR, a field-glass, opera-glass or microscope, fitted for the simultaneous use of both eyes. See MICROSCOPE, Vol. XVI, p. 272.

BINTURONG, a name applied to a very large number of species of the civet-cat family found in the East Indies. One species has a prehensile tail larger than that of any of its allies, the cats and hyenas. See, under *Viverra*, in MAMMALIA, Vol. XV, p. 436.

BIOBIO, the largest river of Chile. (See CHILE, Vol. V, p. 617.) It runs through the province of Biobio, which lies between Concepcion and Malleco, in the southern portion of the state. The area of the province is 4,158 square miles, with a total population of about 130,000. The capital city is Los Angeles, with a population of about 5,000.

BIOGENESIS, the name used by Huxley for generation of living matter by the agency of pre-existing living matter. Biogenesis is the converse of *abiogenesis*, spontaneous generation. See REPRODUCTION, Vol. XX, p. 422.

BIOLOGY, ANIMAL. See EMBRYOLOGY, in these Supplements.

BIONDO, FLAVIO, OR FLAVIO, BIONDO, an Italian archæologist; born at Forlì in 1388. He became secretary to Pope Eugenius IV and to three succeeding popes; but he obtained his fame by his work illustrating the archæology of his country, three voluminous encyclopædic works attesting his diligence: *Italy Illustrated* (1474), *Rome Triumphant* (1482), and *Rome Restored* (1482), and upon which succeeding workers in the same field have largely based their compilations. He died in 1483.

BIOTITE, a mineral of the mica group, named after the French physicist, J. B. Biot. It is sometimes termed *magnesia mica*. See MINERALOGY, Vol. XVI, p. 412.

BIOT, EDOUARD CONSTANT, a French Orientalist; born in Paris, April 2, 1803, his father being Jean Baptiste Biot, the physicist and astronomer. Edouard was intended for the profession of civil engineering, but his health interfering, he took up the study of Oriental languages and became an authority on Chinese subjects. He wrote a work on the *Abolition of the Ancient Slavery in the Occident* (1840), which work obtained a gold medal from the Institute, and a *Dictionary of Chinese Towns*, etc. (1842), besides contributing largely on such subjects to the *Journal* of the Paris Asiatic Societies. He became a member of the French Academy in 1847, and died March 12, 1850.

BIPINNARIA, the scientific name applied to the free-swimming bilateral larvæ of certain starfishes. It was formerly mistaken for a distinct animal. The larva is at first of a cylindrical form, and more or less uniformly ciliated. Later the cilia become restricted to a band, which becomes drawn out into a number of irregular arms.

BIPONTINE EDITIONS, a celebrated edition of the Greek, Latin and French classics, pub-

lished in 1779 at the town of Deux Ponts (q.v.), Bavaria, by a society of learned and eminent men.

BIRCH, CHARLES BELL, an English sculptor; born at Brixton, Sept. 28, 1832. He studied art at the Somerset House School of Design in London and at the Berlin Royal Academy. In 1864 he gained a prize of three thousand dollars for his group, *A Wood Nymph.* He executed a heroic-sized statue of *Lord Beaconsfield* for the city of Liverpool, and one of *Queen Victoria* for India, as well as a monument of *Jenny Lind.* He exhibited *The Last Call* in 1879, and was elected an associate of the Royal Academy in 1880. He died in London, Oct. 17, 1893.

BIRCH, SAMUEL, an English Egyptologist; born in London, Nov. 3, 1813. He was educated at Merchant Taylors' in 1834, and entered the public service under the commissioners of public records, and in 1836 became assistant in the archæological department of the British Museum. In this capacity he applied himself with untiring zeal to the study of Greek and Roman antiquities, including numismatics, and to Egyptian hieroglyphics, and was soon recognized as the leading British Egyptologist. He assisted Baron Bunsen in the philological portion of *Egypt's Place in Universal History*, the last volume of which, after Bunsen's death, was admirably edited and rewritten by him. This volume contained the only English translation of the famous Egyptian *Book of the Dead.* In 1861 he was appointed keeper of the Egyptian and Oriental antiquities, and in 1874 was president of the London Congress of Orientalists. Besides three works connected with his Chinese studies, he was author of numerous works on Egyptology, including *Ancient History from the Monuments of Egypt* (1875); *Egyptian Texts* (1877); and was a contributor to various learned journals. He died in London, Dec. 27, 1885.

BIRD, EDWARD, an English artist; born at Wolverhampton in 1772. He was apprenticed to a maker of Japanese tea-trays in Birmingham, his work being to ornament these articles with flowers and figures. He afterwards became a drawing-master in Bristol. He sent a picture, *Good News*, to the Royal Academy in 1809, which attracted favorable attention, and later the *Choristers Rehearsing* and *The Will* procured him influential patronage, and in 1814 he was appointed painter to the Princess Charlotte, and in 1815 was elected a Royal Academician. His picture, *The Field of Chevy Chase the Day after the Battle*, is regarded as his masterpiece. He is remembered also for his pictures, *The Blacksmith Shop; The Country Auction; The Village Politicians;* and *The Young Recruit.* He also painted *The Death of Eli*, and left unfinished *The Embarkation of Louis XVIII for France.* He died in Bristol in 1819.

BIRD, FREDERICK MAYER, an American churchman; born in Philadelphia, Pennsylvania, June 28, 1838. He graduated at the University of Pennsylvania in 1857, and Union Theological Seminary in 1860. He was ordained as Lutheran minister, served as an army chaplain, became a Protestant Episcopal clergyman, and was successively pastor at Spotswood, New Jersey, and South Bethlehem, Pennsylvania. He was professor of psychology, Christian evidence, and rhetoric in Lehigh University from 1881 to 1886. He is a writer on hymnology, chief editor of the *Lutheran Hymn Book*, and editor of *Charles Wesley Seen in his Finer and Less Familiar Poems* (1867). He possesses the finest library of hymnology in America.

BIRD, ISABELLA (Mrs. Bishop), an adventurous lady traveler, long resident in Edinburgh, Scotland. She visited Canada and the United States in 1854, subsequently visiting the Sandwich Islands and Japan. While on her travels, she from time to time sent home letters describing what she saw and did, and from such materials most of her books have been compiled. Her lively and picturesque narratives of journeys made to the Rocky Mountains, to the aborigines of Yezo, and the shrines of Nihko and Ise in Japan, and the Straits Settlements, have been very popular. Her books are *The Englishwoman in America* (1858); *Six Months Among the Palm Groves of the Sandwich Islands* (1875); *A Lady's Life in the Rocky Mountains* (1879); *Unbeaten Tracks in Japan* (1880); and *The Golden Chersonese* (1883).

BIRD, ROBERT MONTGOMERY, an American author; born in Newcastle, Delaware, in 1805, and studied medicine at the University of Philadelphia, taking the degree of M.D. He produced for the stage the tragedies of the *Gladiator* (in which Edwin Forrest obtained fame) and *Oraloosa and The Broker of Bogota.* In 1834 and 1835 appeared his novels, *Calavar, or the Knight of the Conquest;* and *The Infidel, or the Fall of Mexico*, which dealt with scenes in the Mexican conquest. They have been much admired and praised for the accuracy of their detail and dialogue. In 1835 appeared also *The Hawks of Hawk Hollow*, a tradition of Pennsylvania; and then followed *Sheppard Lee* (1836); and *Nick of the Woods, or the Jibbenainosay* (1837); *Peter Pilgrim*, a collection of the author's periodical contributions (1838); and *The Adventures of Robin Day* (1839). In 1847 he became associated with Morton McMichael in the publication, in Philadelphia, of the *North American and United States Gazette.* He died Jan. 22, 1854.

BIRD–CATCHING SPIDER, a name properly applied to a large spider (*Mygale avicularia*) found in tropical regions. The body of the spider is about two inches in diameter, and the legs, when spread, cover an area of a foot in diameter. It is nocturnal, never builds webs, and is said to capture small birds.

BIRD–CHERRY (*Prunus Padus*) is a small tree of Europe, whose flowers and small fruits are in racemes. The cherries are hardly edible, but are somewhat used in making liquors. Called "hagberry" in Scotland. In the United States the indigenous *Prunus Pennsylvanica* is sometimes called "bird-cherry."

BIRD ISLAND OR MODU MANN, the northwest island of the Sandwich (or Hawaiian) archipelago, in lat. 22° 20′ N., and long. 160° W. It is, as its name implies, a mere haunt of sea-fowl,

the links of the chain increasing pretty regularly in size and elevation from Bird Island on the northwest to Hawaii on the southeast.

BIRD-LICE, the common name for lice which infest the plumage of birds. See LOUSE, Vol. XV, p. 24.

BIRDLIME, an adhesive substance placed on twigs of trees or wire netting for the purpose of catching small birds. It is largely derived from the holly (q.v.) and the mistletoe (q.v.). A common practice is to place a decoy or tame bird in a cage near where the birdlime is spread; the wild birds, attracted to the spot by the song of the tame bird, become entangled in the birdlime.

BIRDSALL, WILLIAM RANDALL, an American neurologist; born at Greene, New York, and graduated in the medical department of the University of Michigan in 1876. He studied neurology in Europe and in the hospitals of New York City, and published a work entitled *Electro-Therapeutics and Electro-Diagnosis*. He died in New York City, June 7, 1892.

BIRD'S-EYE LIMESTONE, a division of the Trenton group of the Lower Silurians of North America, apparently equivalent to the Llandeilo flags, and containing, besides the remains of brachiopods, many enormous orthoceratites. Similar fossils are in the Lower Silurian strata on the same parallel in Great Britain and Scandinavia, but disappear farther south, suggestive of similar climatic conditions then and now. See GEOLOGY, Vol. X, p. 333.

BIRD'S-FOOT, a name applied to several plants, notably to species of the genus *Ornithopus*, of the family *Leguminosæ*, deriving both its popular and botanical name from the resemblance of the curved pods to birds' claws. The name is also applied to *Euphorbia Ornithopus*, a spurge of the Cape of Good Hope.

BIRD'S-FOOT TREFOIL (*Lotus*), a genus of plants of the family *Leguminosæ*. The pods are cylindrical, somewhat spongy within, and imperfectly divided into many cells. The name is derived from the resemblance of the cluster of pods to a bird's foot. The species are very numerous, and are natives of temperate and cold regions. The common bird's-foot trefoil (*Lotus corniculatus*) has a stem from 6 to 12 inches in length, bearing umbellate heads of 8 to 10 yellow flowers, which have a rich, honey-like smell. The leaves have three ovate leaflets like those of the clover, but at the base of each leaf-stalk there are two large leaf-like oviate stipules. The plant is by some regarded as the shamrock of Ireland. It is eaten with great avidity by cattle, and its deeply penetrating roots adapt it well for very dry situations. A species called "winged pea," remarkable for four membranous wings which run along its pods, a native of the south of Europe, is cultivated for its seeds, which are used as a substitute for coffee.

BIRD'S-NEST, a name applied to several plants whose habit of growth or form suggest the resemblance to a bird's nest. *Neottia nidus-avis*, a British orchid, grows in dark woods, especially beech, its roots forming a nest-like mass of interlaced fibers; *Monotropa hypopitys*, a root-parasitic ericaceous plant, grows on the roots of trees in beech or fir woods, the leafless stalks resembling a nest of sticks; *Asplenium nidus*, called bird's-nest fern, from the manner in which the fronds grow, leaving a nest-like hollow in the center; *Daucus Carota*, the wild carrot, whose flower and fruit umbels are concave, like a nest; a group of fungi, *Nidulariaceæ*, which resemble small nests containing eggs, and hence called bird's-nest fungi.

BIRD'S-NESTS, EDIBLE. See SWIFT, Vol. XXII, p. 760.

BIRDS OF NORTH AMERICA. See BIRDS, Vol. III, pp. 699–778. See also under DISTRIBUTION, Vol. VII, pp. 267–290.

BIRDS OF PREY, the common name of birds which prey upon other birds, and upon other higher animals. Most of them belong to the order *Accipitres*. See ORNITHOLOGY, Vol. XVIII, p. 47.

BIRDWOOD, SIR GEORGE CHRISTOPHER MOLESWORTH, Orientalist, was born in Belgaum, Bombay, Dec. 8, 1832. He was graduated at the University of Edinburgh in 1854, and the same year returned to Bombay, having been appointed on the medical staff of the East India Company. In 1857 he was appointed professor of anatomy and physiology in Grant Medical College, Bombay, and later, also, to the chairs of botany and *materia medica*. He was curator of the Government Central Museum at Bombay and also registrar of the university. The honor of knighthood was conferred on him in September, 1881. At the Paris exposition of 1889 he was chairman of the committee of the British Indian section. He is the author of numerous papers on scientific subjects, books on the botany of India and on the arts of India, etc. One of his most important contributions is the *Report on the Old Records of the India Office* (1879), in which he gives complete and comprehensive data on early European settlements in India. He was a contributor to the ENCYCLOPÆDIA BRITANNICA, and to many publications dealing with Oriental matters. In 1879 he was appointed special assistant in the revenue, statistics and commerce department of the India office.

BIREN OR BIRON, ERNEST, Duke of Courland; born in 1690, he came to St. Petersburg in 1714, and attached himself to the court. He soon became a favorite of Anna Ivanovna, empress of Russia. After the death of Anna in 1740, he was exiled to Siberia, but recalled two years later by Anna's successor, Elizabeth. He retired to his dukedom of Courland, where he died, Dec. 28, 1772. See ANNA IVANOVNA, Vol. II, p. 60.

BIRETTA, a square cap worn by the clergy of the Roman Catholic Church, and by some ritualists in the Anglican Church. That of priests is black, of bishops purple, of cardinals red. Originally round, its present form, with straight erect edges, and a tuft or button on the crown, dates only from the seventeenth century; but the low

head-covering of English bishops was known as the *birettum* as early as the thirteenth century. See also CARDINAL, Vol. V, p. 98.

BIRIOUTCHE OR BIRIUTCH, a town in the government of Woronetz, southern Russia, on the left bank of the Sosna, an affluent of the Don; it is surrounded with earthen ramparts and a ditch, and has four annual fairs. Population, about 3,000. A stream of the same name in its immediate vicinity is noted for its pearl oysters, and the teeth of elephants are often found exposed on its banks.

BIRKENFELD, a German principality belonging to Oldenburg, but geographically included in Prussia, with which it has been connected since 1817. It has an area of 194 square miles, with a population of (1885), 42,178. It is mountainous, well wooded, and watered by the Nahe, one of the tributaries of the Rhine. Its chief products are cattle, oil-seeds, flax and hemp. Iron and coal are mined in considerable quantities. The capital, Birkenfeld, has a population of 2,500.

BIRKET-EL-HADJI ("Lake of the Pilgrims"), a small lake 10 miles N.E. of Cairo, on the principal road between Cairo and Suez, where the Mecca pilgrims assemble and disband. The ruins of Heliopolis are in its vicinity.

BIRMINGHAM, a city, capital of Jefferson County, Central Alabama, in a beautiful valley 600 feet above the level of the sea. The streets are broad, well paved, lined with shade trees and well lighted. The courthouse is a magnificent structure, and all the public buildings are erected in a substantial manner, as also are the churches, schoolhouses and hotels. Near by, at East Lake, is located Howard College, founded in 1841 as a Baptist institution. The United Charities have an infirmary costing one hundred thousand dollars. Birmingham is located in the center of the richest coal and iron region in the state, and blast-furnaces and rolling-mills are numerous, some of them affording facilities for an immense and rapidly growing manufacturing business. The Henderson Steel Manufacturing Company is making good steel from the red ores found in the vicinity, and has recently completed a large blast-furnace with a capacity of 70 tons daily. The lines of railway centering here are the Alabama Great Southern, the Southern, Louisville and Nashville, the Kansas City, Memphis and Birmingham, the Central of Georgia, and the Queen and Crescent. In addition to the iron industry, there are numerous manufactories, employing a large force of mechanics. The recent growth of the city in population has been remarkable, the census of 1880 showing an enumeration of but 3,886, while in 1890 there were 26,241, which figures have been nearly doubled since.

BIRMINGHAM, a borough of New Haven County, southwestern Connecticut, situated on the Housatonic River, at the mouth of the Naugatuck, about 10 miles W. of New Haven, and on the Berkshire division of the New York, New Haven and Hartford railroad. The first pin manufactory established in America is located here, and there are extensive manufactories of chains, augers, axles, springs, stockings, paper, silver plate, cutlery, metal bedsteads, etc. Population 1890, 4,413.

BIRNAM, a hill in Scotland, 1,580 feet high. It was once covered by part of an ancient royal forest. Shakespeare has immortalized Birnam Wood in his tragedy of *Macbeth*. See DUNKELD, Vol. VII, p. 543.

BIRNEY, DAVID BELL, son of James Gillespie Birney (q.v., in these Supplements); born at Huntsville, Alabama, May 29, 1825; died at Philadelphia, Pennsylvania, Oct. 18, 1864. He studied law in Cincinnati and practiced in Philadelphia. At the beginning of the Civil War he raised the Twenty-third Pennsylvania volunteers and rose to the rank of major-general. He was present at Yorktown, Williamsburg, the second battle of Bull Run, Fredericksburg, Chancellorsville and Gettysburg. He commanded the Third Corps at Gettysburg, after the wounding of General Sickles, and received the command of the Tenth Corps, July 23, 1864. He died from disease contracted in the service.

BIRNEY, JAMES GILLESPIE, abolitionist; born at Danville, Kentucky, Feb. 4, 1792; died in Perth Amboy, New Jersey, Nov. 25, 1857. After graduation at Princeton in 1812, he studied law in Philadelphia with A. J. Dallas, and removed to Kentucky, where he served in the legislature. He removed to Huntsville, Alabama, in 1825, practiced law, became district attorney, was elected to the legislature, and aided in organizing a branch of the Colonization Society in 1833. He was repeatedly elected mayor of Huntsville, Alabama; was interested in all educational projects in that state; was long the adviser of the Cherokee nation. In 1834 he returned to Kentucky and was made professor in the University of Danville. He was made president of the Colonization Society, which he organized in Kentucky, and published a letter advocating the emancipation of slaves, setting an example by freeing his own (September, 1839). Mr. Birney could not get his antislavery writings printed in Kentucky, and he therefore removed to Cincinnati, where he published *The Philanthropist*, one of the earliest antislavery organs. The office from which this was issued was frequently assailed and partially destroyed by mobs. In 1836 he removed to New York, having been made secretary of the American Anti-Slavery Society, and devoted himself to the work. He was a founder of the Liberal party, which nominated him for the Presidency in 1840, when he was in England. In 1842 he removed to Saginaw, Michigan, and two years later was again nominated for the Presidency, receiving more than 62,000 votes in 13 states. This deprived Henry Clay of the electoral vote of Michigan and secured the election of James K. Polk. After a severe fall from his horse, Mr. Birney retired from public life.

BIRRELL, AUGUSTINE, an English lawyer and man of letters; born at Wavertree, near Liverpool, England, Jan. 19, 1850. He was educated

at Amersham Hall School and Trinity Hall, Cambridge, at the latter of which he graduated with honors, in law and history, in 1872. He was called to the bar by the Inner Temple in 1875, practices in the chancery division, and has been created a Queen's counsel. Mr. Birrell's principal title to fame is a pleasant and scholarly fancy for literary criticism and belles-lettres. His two volumes of *Obiter Dicta;* a *Life of Charlotte Brontë*, and numerous articles in the leading reviews, have been favorably received. Westminster had considerable attractions for him, and after two unsuccessful contests in Lancashire he was elected a member of Parliament for the western division of Fife in 1889.

BIRS, a small but famous affluent of the Rhine. It rises in Berne, Switzerland, flows through Münsterthal, and enters the Rhine near Basel. At St. Jacob, the "Swiss Thermopylæ," about 2 miles from that city, 1,500 Swiss died fighting the French in 1444, and in July, 1449, near the village of Dornbach, about a mile and a half south of Basel, 6,000 Swiss gained a victory over 15,000 Austrians.

BIRTHWORT, the popular name of *Aristolochia Clematitis* of Europe, from its supposed usefulness in parturition. Transferred also to other species of *Aristolochia*, and sometimes applied to the whole family *Aristolochiaceæ*. The *Aristolochias* of the United States are more commonly called "snakeroots."

BISACQUINO OR BUSSACCHINO, a town of Sicily, about 27 miles S. of Palermo, carrying on an extensive trade in grain, oil and lint. Population, 9,578.

BISALNAGAR, a town of India, in the Guico war of Baroda's territories, 220 miles N.W. of Mhow. It has a large transit trade, and manufactures cotton cloth. Population, 20,000.

BISCHOF, KARL GUSTAV, a German chemist and geologist; born near Nuremberg, Jan. 18, 1792, and in 1822 became professor of chemistry in Bonn, where he died, Nov. 30, 1870. His writings include technical treatises of botany, chemistry and geology, the most valuable being a *Manual of Chemical and Physical Geology*, which went through several editions. Between 1837 and 1840 he began a series of important experiments on inflammable gases in coal-mines, and on safety-lamps, and wrote an essay on the subject of avoiding explosions.

BISCHOFF, THEODOR LUDWIG WILHELM, a German anatomist and physiologist; born in Hanover, Oct. 28, 1807; died in Munich, Dec. 5, 1882. He studied at Bonn and Heidelberg, becoming in 1836 extraordinary professor and in 1843 ordinary professor of anatomy and physiology at the latter university. From 1844 to 1855 he filled the same chair at Giessen, where he founded a physiological institute and anatomical theater, and from 1855 to 1878 at Munich. Bischoff's studies were mainly in embryology and biology.

BISCUIT, in pottery, the term applied to porcelain and other earthenware after the first firing. See POTTERY AND PORCELAIN, Vol. XIX, pp. 605, 618, 629.

BISHOP, a beverage composed of red wine, poured warm or cold over ripe bitter oranges, sugared and spiced to taste, the quality depending upon the excellence of the wine employed. If white wine is used, the beverage is called *cardinal*, and with Tokay it becomes *pope*.

BISHOP, ANNA, an English concert singer, born in London in 1814; died in New York, March 19, 1884. She possessed a soprano voice of unusual power, and made her *début* in 1837, singing in concert and opera in nearly all the countries of the globe, retaining her voice until 1868, when she retired from the stage. Her first husband was Sir Henry Rowley Bishop, the composer (q.v., Vol. III, p. 789), to whom she was married in 1831. Leaving him in 1835 she contracted an alliance with her Italian music teacher, named Boscha, and after his death in 1855, became the wife of an American merchant, Martin Schultz. Her father's name was Rivière.

BISHOP, WILLIAM HENRY, an American author, born in Hartford, Connecticut, Jan. 7, 1847, and graduated at Yale in 1867. He wrote several serial stories, which appeared in the *Atlantic Monthly* and other magazines. In 1888 he went to Europe, where he remained until 1893. Among his works are *Detmold* (1879); *Old Mexico and Her Lost Provinces* (1883); *The House of a Merchant Prince* (1883); *Choy Susan* (1884); *The Golden Justice* (1886); *The Brown Stone Boy* (1888); and *A House Hunter in Europe* (1893).

BISHOP'S CASTLE, a town in the southwest of Shropshire, 19 miles S.W. of Shrewsbury. It is irregularly built on a hill slope. The bishops of Hereford had formerly a castle here, now destroyed. During the civil wars of the seventeenth century, the inhabitants took shelter in the church, which was demolished over their heads. Population 1891, 1,586.

BISHOPS SUFFRAGAN are those appointed to assist a regular bishop in the charge of some portion of a diocese, which on account of its importance requires particular attention. The powers of a bishop suffragan are limited to the discharge of duties under the direct instruction or commission of the superior, which duties terminate with the death of the diocesan, and the suffragan does not inherit them. A bishop suffragan takes his style from the town or district with which he has been especially associated—as the Bishop Suffragan of Dover, connected with the province of Canterbury. The office originated in the time of Henry VIII, suffragans being established in 26 places named as sees of bishops suffragan. This peculiar institution, which for a long time lay dormant, has been revived during the reign of Queen Victoria; additions to the above number of suffragan sees being permissible by an order in council. By the act every archbishop or bishop who presides over such a see can name two suitable spiritual persons and present their names to the crown, which selects one to be presented to

the metropolitan, who commissions him to fullfil the functions delegated to him as a suffragan.

BISHOP-WEED (*Ægopodium podagraria*), also called "gout-wort," an umbelliferous weed, exceedingly difficult of extirpation on account of its creeping rhizomes. It is eaten by cattle, and the leaf-stalks were formerly boiled and eaten as greens. In the United States the name is applied to a somewhat similar umbelliferous plant, *Discopleura capillacea.*

BISIGNANO, a town of Italy, in the province of Cosenza, 14 miles N. of the town of Cosenza. It has a cathedral, a seminary, a castle and a trade in silk, and gives the title of prince to the existing branch of the Sanseverino family. Population, about 5,000.

BISLEY, a town of Gloucestershire, England, 11 miles S.E. of Gloucester. The church contains some interesting monuments, a cross-legged knight in armor, and an ancient stone font. The canal uniting the Severn and the Thames passes through the town. The annual volunteer rifle competition, formerly held at Wimbledon, was transferred to this place in 1890. The manufacture is coarse wool clothing. Population 1891, 5,202.

BISMARCK, capital of North Dakota, and county seat of Burleigh County, situated on the Missouri River, about 60 miles N. of the southern boundary of the state. The situation of the city is a delightful one, commanding charming views of the Missouri valley and the surrounding region. The principal objects of interest are the State Capitol, set upon an eminence in the northern part of the city; the penitentiary, the courthouse and a fine high-school building. A bridge, built at a cost of a million and a half dollars, by the Northern Pacific railroad, here crosses the river, which is navigable for more than a thousand miles above Bismarck. The chief industries are the manufactures of flour and of malt products. It is the center of trade in a region growing immense crops of wheat, oats and potatoes, which products are shipped from Bismarck. The city does an extensive trade with the river forts, posts and landings, both to the north and south, by steamboat lines. Population 1890, 2,186.

BISMARCK ARCHIPELAGO is the name given by Germany to a group of islands off the northeast coast of New Guinea, in the Pacific, consisting of those formerly called New Britain, New Ireland, New Hanover and Duke of York, the first two being now called Neu Pomern and Neu Mecklenburg, and the last Neu Lauenburg. The German government assumed possession in 1884, and the next year they were assigned to the New Guinea company, which has a trading-station at Matupi. Their area is 20,000 square miles, and the estimated population in 1891 was 190,000, of which only about 60 were Europeans. The chief exports are copra and cocoanut-fiber.

BISMARCK-SCHÖNHAUSEN, OTTO EDWARD LEOPOLD, PRINCE VON, ex-chancellor of the German Empire and foremost of statesmen, was born April 1, 1815, at Schönhausen, in Brandenburg, of an old family, of which various members were prominent as soldiers and statesmen. He received his university education at Göttingen, Berlin and Greifswald, but became more distinguished as a swordsman than as a student. After finishing his studies he lived for a time on his estates. Before 1847 he was little heard of, but about that time he began to attract attention in the new Prussian Parliament as an ultra-royalist.



PRINCE BISMARCK.

Bismarck's diplomatic career commenced in 1851, when he was appointed Prussian member of the resuscitated German diet of Frankfort. Here he began to manifest that zeal for the interests and aggrandizement of Prussia which afterward undeviatingly guided him, and openly expressed discontent with the predominance of Austria. He remained at Frankfort till 1859, when he was recalled from the diet and sent as minister to St. Petersburg. In the spring of 1862 he was transferred to Paris. During his short official stay there he visited London, and met the leading politicians of the time. In the autumn, when the king's government could not obtain the consent of the Lower House to the new and expensive military organization, Bismarck was recalled to take the portfolio of the ministry for foreign affairs, and the presidency of the cabinet. Being unable to pass the reorganization bill and the budget, he closed the chambers, announcing that the government would do without the sanction of the deputies. (See PRUSSIA, Vol. XX, pp. 12, 13.) The army reorganization went on, and the next four sessions of Parliament, refusing their sanction, were dissolved in the same way.

At the death of the king of Denmark, Bismarck was adroit enough to aggrandize Prussia by the acquisition of the Elbe duchies. (See GERMANY, Vol. X, pp. 502–503.) Throughout the events which ended in the humiliation of Austria at the battle of Königgrätz (1866), and the reorganization of Germany under the leadership of Prussia, Bismarck was the guiding spirit, and through this success, from being universally disliked, he became the most popular man in Germany.

The action of France in regard to the candidature of Prince Leopold of Hohenzollern for the throne of Spain gave Bismarck the opportunity of carrying into action the intensified feeling of unity among Germans. During the Franco-German war of 1870–71 he was the spokesman of Germany, and it was he who dictated the terms of peace to France as embodied in the Treaty of Frankfort, May 10, 1871, by which he secured to Germany the recovery of Alsace-Lorraine and an indemnity of $1,000,000,000.

Having been made a count in 1866, Bismarck was now created prince and chancellor of the German Empire. After the war his policy, domestic and foreign, was to consolidate the young

empire of his own creation by rendering its institutions more beneficent, authoritative, homogeneous and stable, and to secure it, through alliance and political combinations, against attack from without. Thus, conceiving the authority of the government to be endangered by the Church of Rome and its doctrines, he embarked on a long and bitter struggle with the Vatican. But he had underrated the resisting power of the Roman Church, and motives of political expediency finally led him to modify his policy.

Among the more important measures by which Bismarck's domestic policy was marked are a reformed coinage, a codification of law, a nationalization of the Prussian railways, fiscal reform in the direction of making the empire self-supporting (independent of "matricular contribution" from its component states), repeated increase of the army, and the regular voting of its estimates for seven years at a time, and the introduction of a protective tariff (1879). He attempted to combat social democracy by means of economic experiments, which caused him to be called the greatest state socialist of the age.

In 1884 Bismarck inaugurated the career of Germany as a colonizing power, which brought him into temporary conflict with the British cabinet, of which W. E. Gladstone was then premier. For the rest, his foreign policy was mainly aimed at isolating France and rendering her incapable of forming anti-German alliances, while, on the other hand, he gradually combined the central powers of Europe into a peace league, aiming at counteracting the aggressiveness of Russia and France, separately or combined, on the Danube or the Rhine.

The resignation by Prince Bismarck of his office as Prussian prime minister, as well as chancellor, was announced in February, 1890, but did not actually occur till March 17th, when divergences of opinion between him and the Emperor William II led to his retirement. His departure from Berlin on the 29th was the occasion of a great popular demonstration in his favor. The ex-chancellor has since resided chiefly at his country residence. Since leaving office Prince Bismarck has, by his outspoken criticisms on political matters, made himself for a time displeasing to the government, but in 1894 the Emperor became reconciled to him, and in March 26, 1895, Emperor William II visited him at Friedrichsruhe, with great ceremony, on the occasion of the celebration of the old "Iron Chancellor's" eightieth birthday.

BISON, The American, or, as it is generally and incorrectly called, The Buffalo. (See Bison, Vol. III, p. 792.) This shaggy monarch of the once boundless American prairie has, like the Indian, whose food and clothing it provided, been driven out by the advance of the cultivator. First decimated by frontiersmen in order to find food for the laborers constructing the transcontinental railroads, the bison was, on the completion of those roads, ruthlessly slaughtered by organized gangs of "pothunters" for the sake of the hide, horns and hump. The question of the absolute extinction of the buffalo or bison as a species was but a question of a few months, when the Federal government took charge of a small herd of some 200 bulls and cows and headed them for the strictly preserved reservation of the Yellowstone National Park. Here the herd is said to have slowly increased. Several wealthy persons, possessing large tracts of inclosed land for sporting purposes, have obtained possession of small herds, and in some instances have successfully crossed the breed with domestic cattle. The principal owners of herds are said to be "Buffalo" Jones of Nebraska, the late Austin Corbin, and Colonel



THE AMERICAN BISON.

William F. Cody, "Buffalo Bill" (q.v., in these Supplements), The passing of the buffalo was in itself a necessity, and did more to settle the Indian problem than anything else. With the failure of his food-supply the tireless raider of the plains was perforce confined to his reservation, where a paternal government gratuitously and periodically distributed cattle and clothing.

BISSAGOS or BIJUGA ISLANDS, a group of small volcanic islands off the west coast of Africa, opposite the mouth of the Rio Grande, under Portuguese protection. Many of the islands appear to be thickly settled by a savage, low-caste negro race, who cultivate maize, bananas and palms, and feed cattle and goats, which constitute their chief wealth. Bassao, one of the group, on which there is a Portuguese settlement, has a population of 8,000. It carries on a large trade in slaves, also in rice, wax, hides, etc. See Senegambia, Vol. XXI, p. 661.

BISSELL, Edwin Cone, a religious writer; born at Schoharie, New York, March 2, 1832; graduated at Amherst College in 1855, and at Union Theological Seminary in 1859. He was a Congregational pastor from 1859 until 1873, and was a missionary in Austria from 1873 to 1878. In 1881 he became professor of Hebrew in Hartford Theological Seminary, and in 1892 accepted a professorship in McCormick Theological Seminary, a Presbyterian institution in Chicago. Among his works are *The Historic Origin of the Bible* (1873); *The Pentateuch: Its Origin and Structure* (1885); *Biblical Antiquities* (1888); and *Genesis*, printed in colors, showing the original sources from which it is supposed to have been compiled, with an introduction (1892). He died in Chicago, April 9, 1894.

BISSELL, William H., an American statesman, born at Hartwick, near Cooperstown, New

York, April 25, 1811. He graduated at Jefferson Medical College in 1835; practiced medicine, and afterward law. He went to Illinois in 1837, and was elected to the legislature of that state in 1840. He then served in the Mexican War, and took a distinguished part in the battle of Buena Vista. From December, 1849, to March 3, 1855, he served in Congress as an Independent Democrat, but left the Democratic party over the Kansas-Nebraska bill, and was elected governor of Illinois as a Republican in 1856. He was re-elected, and died in office, at Springfield, March 18, 1860. During the discussions on the Missouri compromise in Congress, Jefferson Davis took exception to a statement made by Mr. Bissell, and challenged him, but friends interfered and there was no duel.

BISSELL, WILSON SHANNON, an American statesman; born in Rome, New York, Dec. 31, 1847. He was graduated at Yale College in 1869. He was Mr. Cleveland's law partner when the latter was elected mayor of Buffalo. Mr. Bissell is regarded as being one of the ablest railroad lawyers in the United States. He was appointed Postmaster-General, March, 1893, but resigned the office, Jan. 27, 1895.

BISSEN, HERMAN WILHELM, a Danish sculptor; born at Silding, near Schleswig, Oct. 13, 1798. After studying for seven years in Copenhagen he went to Rome and studied his favorite art under his countryman, Thorwaldsen, remaining ten years. He returned home and executed some notable works, such as *Oersted; Atalanta Hunting*, etc. He was commissioned by his government in 1841 to execute 18 statues larger than life-size. Among his other works are an *Apollo;* a *Venus; and Cupid Sharpening His Tools.* Besides these he executed the frieze for the great hall of the palace at Copenhagen, which depicted the development of the human race according to the Greek mythology. His equestrian statue of Frederick VII at Copenhagen is regarded one of the finest of his works. All his great works are to be found in Copenhagen, where they have exercised great influence upon the art of his country. In 1850 he was appointed director of the Academy of Arts at Copenhagen, where he died, March 10, 1868.

BISSEXTILE. See CALENDAR, Vol. IV, p. 667.

BISSON, ALEXANDER CHARLES AUGUSTE, a French dramatist, born at Briouze, Aug. 9, 1848. Going to Paris, he entered the department of public instruction, but remained only a short time, retiring that he might devote himself to dramatic literature, and became an author of vaudevilles, comedies and operettas. Among his productions are *Quatre Coups de Canif* (1875); *Le Chevalier Baptiste* (1874); *Un Voyage d'Agrément* (1881); *Rue Pigalle* (1882); *Ninette* (1882); *Le Député de Bombignac* (1884); *Ma Gouvernante* (1887); *Le Roi Koko* (1887); *Feu Toupinel* (1890), etc. M. Bisson was also one of the authors of *Grammaire de la Musique* (1879); of *Petit Traité de Composition Musicale* (1881); and *Petite Encyclopédie Musicale* (1881–83).

BISTENEAU, a lake in the northwestern portion of Louisiana. It is about 25 miles long and from 2 to 5 wide. It forms, in its southern half, the boundary between Bienville and Bossier parishes, its northern half lying in Webster Parish, from which it is fed by the Bayou Dorcheat and other streams, and empties itself by a short outlet into the Red River that flows through the state in a southeasterly direction.

BISTORT, the *Polygonum bistorta*, native of Europe and Asia, so named from its twisted roots. It is also called "snakeweed" and "adder's-wort," and is astringent throughout, the roots yielding an especially powerful astringent. The white or pinkish flowers are borne in a dense terminal spike. The "alpine bistort," of high mountains and the arctics, is *P. viviparum.*

BISTRE, a brown pigment. See PIGMENTS, Vol. XIX, p. 88.

BISTRITZ, a fortified town of northeast Transylvania, beautifully situated on the Bistritz River, in a fine valley. In its vicinity are the remains of an ancient castle, once the residence of the illustrious Hunyady. It has several large cattle fairs, but the extensive general trade it once carried on is now entirely gone. Forming, as it does, the last strong position in the northeast of Transylvania, it was repeatedly the scene of hot strife between the Hungarian and Austrian generals in 1848 and 1849. Population, about 9,000.

BIT OR BITT, in ship-building, a frame for fastening the cable when the ship rides at anchor, and for "leading" the principal ropes for the rigging. See SEAMANSHIP, Vol. XXI, p. 603.

BITHOOR, a town in India, in the district of Cawnpore, and subpresidency of the Northwest Provinces, situated on the right bank of the Ganges. It is particularly devoted to the worship of Brahma; has numerous pagodas, and is, of course, a favorite resort for pilgrims, who here as at Benares and Bindraban, have by means of elaborately constructed ghauts access to the sacred stream for purposes of ablution. During the mutiny of 1857, Bithoor acquired an unenviable notoriety as the stronghold of Nana Sahib. Population, 9,000.

BITLIS, a town in Armenia. See BETLIS, Vol. III, p. 617.

BITTER-KING, a small tree or shrub of the family *Polygalaceæ*, which has received its name from its intense bitterness. It is a native of the Moluccas, and is used as a febrifuge and tonic.

BITTERN OR SALT-OIL, an oily liquid obobtained during the preparation of common salt—the residue when salt water has been boiled and the salt precipitated. From it Epsom salts and other compounds of magnesia were formerly procured.

BITTER-SPAR, a name given to dolomite from the magnesia contained in it. See MINERALOGY, Vol. XVI, p. 397.

BITTER-SWEET OR WOODY NIGHTSHADE. See NIGHTSHADE, Vol. XVII, p. 499.

BITTERWOOD, a name given to the quassia woods of commerce (*Pieræna excelsa* of the West Indies, and *Quassia amara* of Surinam). The

name is also given to the timber of species of *Xylopia*, remarkable for the bitterness of their wood.

BITUMEN AND BITUMINOUS LIME STONES. See ASPHALT, Vol. II, pp. 715, 716.

BITUMINOUS COAL. See COAL, in these Supplements.

BITUMINOUS SHALES, indurated beds of clay, occurring in the coal-measures and containing such an amount of carbon and volatile matter that they are able to keep up combustion when mixed with but a little coal. They are, indeed, impure coal, but a large percentage of ash or earthy matter, which, after burning, retains the original form. Their special value, in a commercial sense, lies in the oils that may be extracted from them. See PARAFFIN, Vol. XVIII, pp. 240, 241).

BITZIUS, ALBERT, a Swiss author; born in Morta, canton of Freiburg, Oct. 4, 1797. He was educated at Bern, being intended for the church; became pastor of Lutzelflüh in 1832, remaining there until his death, Oct. 22, 1854. For a list of his works and an estimate as to his place in literature, see SWITZERLAND, Vol. XXII, p. 799.

BIXIN, the coloring principle of arnotto, or butter-coloring. See ARNOTTO, Vol. II, p. 627.

BIZET, ALEXANDER CÆSAR LEOPOLD, generally known as GEORGES BIZET, a French composer; born at Paris, Oct. 25, 1838. He was a laureate of the Conservatoire, where he studied from 1848 until 1857, and became famous as the author of the opera *Carmen*, in four acts, his last, which was first produced at the Opera Comique, March 3, 1875. He studied composition under Halévy, the Jewish composer, whose daughter he married in 1869. He gained the coveted *Prix de Rome* in 1857, for *Clovis et Clotilde*. His works include *Docteur Miracle* (1856); *Vasco de Gama* (1863); *Les Pêcheurs de Perles* (1863); *La Jolie Fille de Perth* (1867); *Djamileh* (1872); *L'Arlésienne*, interludes (1872); *Patrie*, overture. Much was expected of this gifted composer, but he died suddenly, June 3, 1875.

BJERREGAARD, HENRIK ANKER. See NORWAY, Vol. XVII, p. 590.

BJÖRNSON, BJÖRNSTJERNE, a Norwegian writer; born Dec. 8, 1832, at Kvikne, in Osterdalen, where his father was pastor. After studying at the University of Christiania from 1851, and then for a year at Copenhagen, he returned to Norway in 1857, and published his *Synnöve Solbakken*, which at once attracted great attention. Immediately afterwards he was appointed manager of the Bergen Theater by its proprietor, Ole Bull, and in 1858 he published the tale, *Arne*, and the drama, *Halte-Hulda*. In 1859 he left Bergen to become editor of the *Aftenbladet* at Christiania, but becoming involved in violent controversies he withdrew the next year to Copenhagen, where he published a number of shorter tales and the drama, *Mellum Slagene*. From 1860 to 1862 he resided in Rome, continuing his literary work, and on his return to Norway he was awarded a yearly pension by the Storthing. This pension he resigned in 1887 because the Storthing had refused to grant a pension to Kjelland, whose petition he had indorsed. The pension (four hundred and fifty dollars) was re-voted to him in 1892. During the years 1863–64, he produced two plays, at the same time editing the *Norsk Folkeblad*. He again lived abroad from 1872 to 1876, when he returned to Norway and remained for some years. Holding the highest place in popular favor as a political orator, Björnson took an active part in the movement which led to the victory of parliamentary government in Norway. Though he settled in Paris in 1883, he still made his influence felt in Norwegian politics. A number of his tales have been translated into English and German, and several of his plays have secured a footing on the German stage. Both as poet and novelist Björnson stands in the first rank among living Scandinavian writers. He has written numerous pamphlets on political and religious questions of the day, *A Cantata of Peace* appearing in 1893. (See NORWAY, Vol. XVII, pp. 591, 592, for a list and estimate of his works.) His eldest son, Björn, became a noted Norwegian actor, and his daughter, Bergliot, became a famous singer, and married, in 1891, Sigurd Ibsen, Ph.D., son of the great Norwegian dramatist Henrik Ibsen.



BJÖRNSTJERNE BJÖRNSON.

BJÖRNSTJERNA, MAGNUS FRIEDRICH FERDINAND, COUNT, a Swedish statesman and author; born at Dresden, Oct. 10, 1779. He was educated in Germany, and entered Sweden for the first time in 1793, to join the army, and in 1813 he was appointed lieutenant. In 1826 he received the title of count, and in 1828 was appointed ambassador to the court of Great Britain, which office he held till 1846, when he returned to Stockholm, where he died, Oct. 6, 1847. As a politician his opinions were liberal. In addition to some political writings he published, in 1843, a work on the *Theogony, Philosophy and Cosmogony of the Hindus*.

BLACK, ADAM, a Scottish publisher; born in Edinburgh, Feb. 20, 1784; died there, Jan. 24, 1874. He was trained as a bookseller in his native city and in London. Forming a partnership with a nephew, he established the Edinburgh business of Adam and Charles Black. The firm gained position and fortune chiefly through the purchase of the copyright of the *Encyclopædia Britannica* in 1827, after Constable's failure; and that of Scott's novels from Cadell's representatives in 1851. A seventh and eighth edition of the *Britannica* were issued during Black's business connection with the firm, while the popular editions of Scott's novels had a large and steady sale. Black was a prominent and useful citizen of Edinburgh; was twice lord-provost, and was

Liberal member of Parliament for Edinburgh (1856–65). A statue was erected at Edinburgh in 1877 in recognition of his services.

BLACK, JAMES, an American temperance advocate; born at Lewisburg, Pennsylvania, Sept. 23, 1823. He is a lawyer and an earnest laborer for temperance. In 1867, at a convention in Harrisburg, of which he was chairman, he advocated the formation of a distinct temperance party, which materalized at Chicago in 1869, where the Prohibition party (q.v.) was formed, with Black as president of the convention. At the Prohibitionist convention held in Columbus, Ohio, in 1872, he was nominated by the party as their candidate for President. He is the author of *Is There a Necessity for a Prohibition Party?* (1876); *A History of the Prohibition Party* (1880); and *The Prohibition Party* (1885).

BLACK, JEREMIAH SULLIVAN, American statesman; born in the Glades, Somerset County, Pennsylvania, Jan. 10, 1810. After studying in the common schools he took up the profession of law, being admitted to the bar in 1831, and after 11 years was made judge. He was a Jeffersonian Democrat, was president-judge of his district for nine years, and was elected one of the supreme court judges of Pennsylvania in 1851, and again in 1854. James Buchanan, when he became President, chose Judge Black as Attorney-General. He performed important duties while holding this office; he protected the government from unjust claimants of land grants in California, and held the opinion (1860–61) that the government had the right to put down insurrection. As Buchanan believed the government had no coercive power, the Attorney-General was placed in a trying situation, as he endeavored to save the government from the secessionists. During the latter part of Buchanan's administration, Judge Black was Secretary of State (filling the vacancy of General Cass, resigned), and Edwin M. Stanton held Black's former office. In 1861 he retired from public life. He was engaged in several prominent lawsuits, such as the Vanderbilt will contest and the McGarrahan claim. He died at York, Pennsylvania, Aug. 19, 1883.

BLACK, JOHN, a British scholar and journalist; born in Berwickshire in 1783. He was left an orphan at the age of 12, and commenced life in a law office, but soon left that place for Edinburgh, where he became a clerk to a writer to the Signet. While in this capacity he was assiduous in the work of self-education; he acquired German from a German musician, and Italian from a refugee. He was the author of a *Life of Tasso* (1810), in which year he went to London, and was engaged as a Parliamentary reporter for the *Morning Chronicle*, of which journal he afterward became editor. Charles Dickens was one of his reporters, and John Stuart Mill praised his conduct of that journal. He retired from the editorship in 1843, and died in 1855.

BLACK, WILLIAM, a Scotch novelist; born in Glasgow in 1841. He began his career as a journalist. He was special correspondent of the London *Star* during the war between Prussia and Austria in 1866, and was subsequently assistant editor of the *Daily News*. The work by which he became known as an author of established reputation was *A Daughter of Heth*, published in 1871. *A Princess of Thule* (1873), is perhaps the best of his numerous works. In 1874 he abandoned journalism, and in 1876 he visited America. Since that time he has produced such works as *Madcap Violet*, *White Wings* and *In Far Lochaber*, all of which have been popular. Among his recent novels are *Stand Fast, Craig Royston* (1890), *Donald Ross of Heimra* (1891); *Wolfinberg* (1892); and *The Handsome Humes* (1893).

BLACK ACTS, the acts of the Scottish parliament of the first five Jameses, those of Queen Mary's reign, and of James VI down to 1587. They were called the Black Acts because they were all printed in the black or Saxon characters. See PRESBYTERIANISM, Vol. XIX, p. 681.

BLACK ASSIZE, the common name of an extraordinary and fatal pestilence which broke out at Oxford at the close of the assizes in 1577, immediately after the passing of sentence on Richard Jencks, condemned to lose his ears. It was supposed to be a divine judgment on the cruelty of the sentence; but it is satisfactorily explained by the pestilential atmosphere of the adjoining jail, then, as it was long after, a place of misery, filth and disease. From July 6th to August 12th, 510 persons died in Oxford and the neighborhood of this dreadful malady, among whom were the chief officials who sat on the assize, most of the jury, and many members of the university. See PATHOLOGY, Vol. XVIII, p. 403.

BLACKBAND IRONSTONE, an ore of iron found very extensively in Scotland and elsewhere. It occurs in the Carboniferous system in regular bands, layers or strata, and generally associated with coal and limestone. In smelting it needs only to be ignited. Properly heaped it furnishes its own fuel. See IRON, Vol. XIII, pp. 285, 287.

BLACK BASS. See BASS, in these Supplements.

BLACK BEETLE, a popular name for the common cockroach of Great Britain. The term is also applied to a great family of beetles known as *Melanosomata*.

BLACKBERRY, popular name for the fruit of several members of the genus *Rubus*, of the family *Rosaceæ*. The plants are large bushes, armed with stout prickles, and, especially in England, are called brambles. The fruit consists of a collection of small, black, and juicy drupels which remain adherent to the receptacle. *Rubus villosus*, native of America, is, economically, the most important of the blackberries, and is widely distributed over the United States. Though it grows readily and with great luxuriance in the wild state, careful cultivation has greatly improved the quality of the fruit and has extended the period of its ripening from the middle of July until late September. The bushes demand considerable attention in winter, and should be carefully pruned. They are readily propagated from

root-cuttings. Plants should commence to bear in their second year and continue to produce desirable fruit until 12 years old. *R. villosus* is liable to attack by the orange-rust. This is produced by the parasitic fungus *Cæoma luminatum* or *C. nitens*, which gives the appearance of an orange-red coating on the leaves, and rapidly kills the tissue. Plants thus attacked should be promptly burned to prevent spread of the pest. The stems are often attacked by borer insects. After the stems have borne fruit they should be cut away, that the growth of the new shoots, on which next year's fruit will be borne, may be facilitated. The roots of the high blackberry, *Rubus villosus*, and of the low blackberry or dewberry, *Rubus canadensis*, are much used in medicines as a tonic astringent.

BLACK BOOK, a collection of English admiralty law in the fourteenth century, first edited by Sir Travers Twiss (4 vols., 1871–76). It indicates the pretensions of the civil law as regards trial without jury, torture, etc., which afterwards led to legislation in vindication of the position of the common-law courts. *Black Book* is also a usual term for the reports presented to Parliament in 1536, on which the legislation for the dissolution of the monasteries and the secularizing of their revenues proceeded. These reports probably never existed as a book. A list of habitual criminals, first published in 1879, has been also so called. See ADMIRAL, Vol. I, p. 157; and SEA LAWS, Vol. XXI, p. 584.

BLACK-BULLY OR SAPODILLA (*Achras sapota*), a large South American tree, belongto the *Sapotaceæ*. It is cultivated for its fruit, the sapodilla or sapodilla-plum. Its wood, which is of a reddish-brown color, and very durable, is used for ship-building.

BLACKBURN, JOSEPH CLAY STYLES, a United States Senator, born in Woodford County, Kentucky, Oct. 1, 1838. He was graduated at Center College, Danville, Kentucky, in 1857, and practiced law in Chicago from 1858 to 1860. He entered the Confederate army in 1861, and served through the Civil War. In 1871 and 1873 he was elected to the Kentucky legislature, and in 1875 entered Congress as a Democrat, and was re-elected up to 1882. In March, 1885, he became United States Senator, and was re-elected for the term ending March, 1897.

BLACKBURN, WILLIAM MAXWELL, an American religious author; born at Carlisle, Indiana, Dec. 30, 1828; graduated from Hanover College, Indiana, in 1850, and from Princeton Theological Seminary in 1854. After holding several Presbyterian charges he was appointed professor of biblical and ecclesiastical history in the Presbyterian Theological Seminary in Chicago in 1868, which chair he held until 1881. From that year until 1884 he was pastor of the Central Church of Cincinnati. He was president of the Territorial University of North Dakota for two years, and in 1886 became president of the Pierre University, at East Pierre, South Dakota. Among his works are *Judas the Maccabee and the Asmonean Princes* (1864); *William Farel and his Times* (1866); *Calvin in Paris* (1866), *Ulrich Zwingli* (1868); *St. Patrick and the Early Irish Church* (1869); *Coligny and the Rise of the Huguenots* (1869); *History of the Church from its Origin to the Present Time* (1879), etc.

BLACKBURNE, FRANCIS, Lord Chancellor of Ireland; born at Great Footstown, County Meath, Nov. 11, 1782; died Sept. 17, 1867. In 1798 he entered Trinity College, Dublin. Called to the English bar in 1805, and to that of Ireland in 1822, he was appointed attorney-general for Ireland in 1830 and again in 1841, master of the rolls in 1842, chief justice of the Queen's bench in 1846, and Lord Chancellor of Ireland in 1852 and 1866, serving under both Whig and Tory governments.

BLACKBURN'S PENDULUM. See MECHANICS, Vol. XV, p. 711.

BLACKCAP OR BLACKCAP WARBLER (*Sylvia atricapilla*), a bird of the great family of the *Sylviadæ* or warblers. It is much esteemed for its melodious song, which rivals that of the nightingale. The bird is common in southern Europe at all seasons, but many migrate as far north as the 67th parallel. It is often kept in confinement. See WHITE-THROAT, Vol. XXIV, p. 553.

BLACK CHALK, various kinds of clay-slate, containing a considerable portion of carbon. It is used for drawing, and is also ground down to form a black paint. It is found as a rock of slate texture and bluish-black color in the island of Islay, Scotland, and in Caernarvonshire, Wales; also in Spain.

BLACK DEATH. See PLAGUE, Vol. XIX, p. 164.

BLACK DUCK (*Anas obscura*), a well-known wild duck, allied to the mallard; found throughout eastern North America. It is a valuable game bird.

BLACK EARTH (*Tchernoziom* of Russian geologists), the name given to a deposit which covers vast areas in southern Russia. It closely resembles the löss of Central Europe in texture and structure, and bears the same relation to the glacial accumulations of Russia that the löss of Rhine, the Danube, etc., does to those of central Europe. It is probably the fine-grained silt derived from the torrents that escaped from the melting snows and glaciers of the Glacial period. It varies in color from dark brown to black, and in thickness from a foot or two up to 6 or 7 yards, occasionally reaching, it is said, even to 60 feet, and is of remarkable fertility. See RUSSIA, Vol. XXI, p. 75.

BLACKFEET INDIANS, a tribe of North American Indians, the most western division of the Algonquin stock. See INDIANS, Vol. XII, p. 833.

BLACKFISH, a name often applied to a large fish common along the Atlantic coast, and also called tautog (*Tautoga onitis*). It is a valuable food-fish. The name *blackfish* is also used as a local name for European fishes of other species.

BLACK FLAGS, the name given to the rem-

nant of the Tai-ping army in China, which was finally overthrown in 1864 by Major ("Chinese") Gordon of the royal engineers, and took refuge in Tonquin. See TONG-KING, Vol. XXIII, p. 441.

BLACK FLUX, a chemical compound used in reducing ores, is prepared by heating in a covered crucible ordinary or crude cream of tartar, or the bitartrate of potash, when the tartaric acid is decomposed and charred, forming carbonic acid, which remains in combination with the potash as carbonate of potash, accompanied by much free carbon. This very intimate mixture of carbonate of potash and carbon is a fine black powder of great service in the fluxing of metallic ores, as of lead, and the separation of the metal therefrom. The black flux is likewise employed as the raw material from which, on the application of heat in iron vessels, the metal potassium can be obtained.

BLACK FRIARS, friars of the Dominican order. (See DOMINICANS, Vol. VII, p. 354.) The old Dominican monastery in London, dating from 1276, stood near the north end of Blackfriars Bridge.

BLACK FUNGI, the popular name of the *Pyrenomycetes*, a group of the ascomycetous fungi. The *Ascomycetes* are characterized by the development of the spores in sacs or *asci;* and in *Pyrenomycetes* the asci form a layer (the *hymenium*) inclosed within a case (*perithecium*), which is globular or flask-shaped. The perithecia appear to the naked eye as dark, dotlike bodies, hence the common name. They are mostly parasitic, and infest the greatest variety of plants and also animals. Saprophytic forms occur on dead wood, etc. Probably the best known and most important member of the group is *Claviceps purpurea*, the "ergot" of rye and other grasses, in which the fungus attacks and destroys the ovaries. Another well-known form is *Plowrightia morbosa*, the "black-knot" of plum trees. The species are exceedingly numerous, and vary widely in the complexity of their life-histories. In many cases different phases of the same fungus have been described as distinct genera.

BLACK GUM, a popular name applied to *Nyssa multiflora*, a large and beautiful tree 40 to 70 feet high, belonging to the *Cornaceæ*. It has a beech-like spray, ovate or obovate leaves (which turn bright crimson in the autumn), and dark-blue oval fruit. The wood is tough and hard to split, and is much used for cog-wheels, hubs, yokes, etc. Also called "tupelo," "pepperidge," "sour gum," "hornpipe."

BLACK FRIDAY, any Friday marked by a great calamity. In England it has especial reference to Dec. 6, 1745, as being the day on which news was received in London that the young pretender, Charles Edward, had reached Derby; or to May 11, 1866, from a commercial panic then at its hight, caused by the stoppage of Overend, Gurney and Company, London. In the United States it has reference to the financial panic caused by speculation in gold in the city of New York, Sept. 24, 1869; or to a similar panic which began Sept. 18, 1873.

BLACKGUARD, a term used in the sixteenth century for the lowest menials of a noble house—the scullions who cleaned pots and pans. It was also used of the hangers-on of an army, camp-followers, then a rabble, and now used of vagabonds in general.

BLACK HAWK, a chief of the Sac and Fox tribes of Indians, born in Kaskaskia, Illinois, in 1767; died at his camp on the river at Des Moines, Iowa, Oct. 3, 1838. At an early age he became a trusted brave and a successful chieftain in conducting sorties against the Osage and Cherokee tribes. In 1788 he was grand chieftain of the Sacs. In 1804 the Sacs and Foxes, for an annuity of $1,000, agreed to cede to the United States lands extending about 700 miles along the Mississippi River. This contract Black Hawk repudiated, averring that the chiefs had been made drunk before they signed the documents. During the War of 1812 Black Hawk, moved by Elskwatawa, the Shawnee prophet (q.v., in these Supplements), and tempted with the title of general by British agents, joined the enemy with about 500 warriors; but the Indians soon retired from the British service. In 1816, at St. Louis, Black Hawk was induced to sign the repudiated treaty of 1804. In 1823 most of the Sacs and Foxes, under the leadership of Keokuk, removed to their reservation beyond the Mississippi River; but Black Hawk, with part of the tribe, refused to emigrate, although most of the chiefs had signed a treaty by which the Indian lands east of the Mississippi River became the property of the whites. When the plantings of his people were destroyed and their lands became seized by white settlers, the Indians threatened revenge. On June 25, 1831, General Gaines, at the head of a force of militia, drove the Indians from their settlements. Early in 1832 Black Hawk, with a band of Indians, crossed the Mississippi River, when they began to destroy the whites; but, after several encounters, the Indians were defeated and Black Hawk himself and his two sons became captives. The three were confined in Fortress Monroe until June 5, 1833. Later, Black Hawk was deposed from leadership, and Keokuk became grand chief of the Sacs and Foxes, 3,000 of whom were settled near Fort Des Moines. *A Life of Black Hawk*, by J. B. Patterson, was published in 1834; also one by W. J. Snelling, and another by Benjamin Drake.

BLACKHEATH, an open common in the county of Kent, 5 miles S.E. of London. It commands a fine view of great extent, and being a healthy tract, many villas have been built on its margin. It is a favorite holiday resort for many Londoners. It is one of the places where the ancient Scottish game of golf is practiced. Here the Danes encamped in 1011, and the Londoners welcomed Henry V in 1415 on his return from the battle of Agincourt.

BLACK HILLS, a group of mountains in southwestern South Dakota and northeastern Wyoming territory. Harney Peak, in Pennington County,

South Dakota, the highest in the range, rises 7,403 feet above the sea-level. The region was purchased from the Indians in 1876. It was one of the richest game preserves in the West. Being fertile, well wooded and watered, it is adapted to dairying, but the mountains are most noted for their gold, on account of the existence of which vast mining industries sprang up in 1877. From that date to 1891 the region yielded over $45,000,000 worth of gold. Tin exists chiefly in Custer and Pennington counties, and the region is rich in limestone, copper, lead, iron and silver. A number of towns came into existence in the Black Hills as a result of the mining industry, the largest being Deadwood, with a population in 1890 of 2,366, and Lead City, with a population of 2,581. The amount of gold produced in 1889 in South Dakota was 149,533 ounces, valued at $3,091,137; of silver, 104,672 ounces, valued at $135,331; of lead, 116 tons, valued at $4,652.59. The amount of tin produced in 1889 was 22,000 tons. The Burlington and Missouri River railroad runs north and south through the heart of the region, as does also the Fremont, Elkhorn and Missouri Valley railroad.

BLACK HOLE, a name given to a dungeon or dark cell in a prison, but especially associated with a dungeon known as the "Black Hole of Calcutta," where, in 1756, a party of English men and women were confined and many suffocated. See CALCUTTA, Vol. IV, p. 656.

BLACKIE, GEORGE STODART, an American scientist, was born at Aberdeen, Scotland, April 10, 1834. He studied at Bonn and Paris, and was graduated at the University of Edinburgh, in the medical department, in 1855, receiving a gold medal for his thesis, *Cretins and Cretinism*. Coming to the United States, he became professor of natural history in the University of Nashville, Tennessee, in 1856; retaining the position until 1861, when he served as a surgeon in the Civil War, and has since occupied professorships in Nashville colleges. Among his publications are *Botany the Ally of Medicine* (1859), *Medical Flora of Tennessee* (1859), etc.

BLACKIE, JOHN STUART, a Scottish writer; born in Glasgow in July, 1809; died in Edinburgh, March 2, 1895. He was educated at Aberdeen and Edinburgh, and in 1829 went to the Continent, where he continued his studies at Göttingen and Berlin, and afterwards at Rome. In 1834 he published a metrical translation of Goethe's *Faust*, that was severely criticised by Carlyle, and in the same year passed as advocate at the Edinburgh bar. But he was more interested in literary pursuits than in the practice of his profession, and soon became known by his studies on German subjects. In 1841 he was appointed to the chair of humanity in Marischal College, Aberdeen, but it was some time before he entered into the active duties of the office, refusing to take the oath, which resulted in an act being passed abolishing the requirement. He held the professorship thereafter until 1852, when he was elected to the Greek chair in the University of Edinburgh, which he held for 30 years. After he became professor he took an active part in promoting educational reform, and in the movement that led, in 1859, to the remodeling of the Scottish universities. He always figured as a patriotic champion of Scottish nationality and its characteristic features. During the years of 1874–76 he advocated throughout the country with great enthusiasm the foundation of a Celtic chair in Edinburgh University, and was successful in raising a large sum for its endowment. He then became "the grand old man" of Scotland. He published a fine verse translation of Æschylus in 1850, another of the *Iliad* in ballad meter in 1866, as well as several volumes of verse. His prose works embrace moral and religious philosophy, the method of history and the land laws. His principal philological papers were collected in *Horæ Hellenicæ* (1874). Among his other works are *Lays of the Highlands and Islands* (1872); *Self-Culture* (1874); *The Language and Literature of the Scottish Highlands* (1876); *Altávona: Fact and Fiction from My Life in the Highlands* (1882); *Life of Robert Burns* (1888).

BLACKING, the material employed for producing a black, glazed, shining surface on leather. The main ingredient in various kinds of blacking is bone-black, which is mixed with oil, raw sugar or molasses, and a little sulphuric acid.

BLACK ISLE is a common name for the peninsula, in Easter Ross, lying between the Beauly and Moray Firths and Cromarty Firth. See Ross, Vol. XX, p. 854.

BLACK–JACK, a name given by Cornish miners to blende, or sulphid of zinc. It was also, in former times, the name applied to a kind of drinking-flagon made of leather cord covered with a coating of tar or wax. The little ringnecked duck (*Aythya Collaris*) is popularly known as Black-Jack. The name is also applied to certain species of black oak, especially the *Quercus Catesbæi* of the Gulf states.

BLACK–LEAD, the popular name of graphite, or plumbago, a mineral consisting chiefly of carbon. See CARBON, Vol. V, pp. 86, 87.

BLACKLEG OR BLACK–QUARTER. See *Anthrax*, under MURRAIN, Vol. XVII, pp. 58, 59.

BLACK–LETTER, a name now commonly applied to the Gothic or Old English letter, which was introduced into England about the middle of the fourteenth century. See TYPOGRAPHY, GOTHIC, Vol. XXIII, p. 694.

BLACK–LIST, a name applied to printed lists connected with insolvency, bankruptcy and other matters affecting the credit of firms and individuals, and which are circulated for the private guidance of the mercantile community, with a view of affording protection against bad debts, frauds, etc. The term is also frequently used of any list of persons who are deemed objectionable by the makers or users of the list.

BLACKMAIL. Literally, the term means a rent reserved, payable in work, grain, etc. Rents of this character in ancient times were called blackmail, in distinction from white rent, or rent payable in silver. The term was thereafter applied

to the rents levied by the bands of marauders and outlaws who infested the borders of England and Scotland about the middle of the sixteenth century, and which the people paid to secure protection to their lives and property. In modern times blackmail is equivalent to extortion of money or property to secure the performance of a duty, the exercise of influence, or the prevention of an injury. Extortion by threat or by promises to conceal, or threats to expose, crimes or misdoings, or by working on the fears or credulity of the victim, is blackmail.

BLACK MONDAY, Easter Monday, April 14, 1360, so called from the extraordinary darkness and the fatally bitter cold. Stow, in his *Annals*, says: "The 14 day of April and the morrow after Easter day, King Edward (III), with his host lay before the city of Paris, which day was full darke of mist and haile and so bitter cold that many men dyed on their horses with cold; wherefore unto this day it hath beene called the *Blacke Mouday*." In Dublin, Easter Monday, 1209, was called Black Monday, from the fact that while the citizens of Dublin were celebrating Easter at Cullenswood, in the suburbs, on that fatal day they were suddenly set upon by the native Irish from the mountains, with whom they were at feud, and 500 of them killed.

BLACKMORE, RICHARD DODDRIDGE, an English novelist; born at Longworth, Berkshire, in 1825. Educated at Blundell's School (Tiverton), and Exeter College, Oxford, he subsequently studied law, was called to the bar at the Middle Temple in 1852, and practiced for a time as a conveyancer. His first publications were *Poems by Melanter* (1854); *Epullia* (1855); *The Bugle of the Black Sea* (1862), followed by *The Fate of Franklin* (1860), and a translation of Virgil's *Georgics* (1871). His first novels were *Clara Vaughan* (1864), and *Cradock Nowell* (1866), but his first distinct success was *Lorna Doone* (1869), which reached a twenty-second edition in 1884, and has remained the favorite of his works. Among his other novels are *The Maid of Sker* (1872), perhaps his second best story; *Alice Lorraine* (1875); *Cripps the Carrier* (1876); *Erema* (1877); *Mary Anerley* (1880); *Christowell, a Dartmoor Tale* (1882); *Tommy Upmore* (1884), and *Springhaven* (1887); *Perlycross* (1894), and a volume of verse *Fringilla* (1895). Mr. Blackmore is an amateur market-gardener for recreation, and in 1894 published some interesting articles on that subject.



R. D. BLACKMORE.

BLACK MOUNTAINS, a group in Yancey County, North Carolina, a short distance west of the Blue Ridge, so called from the balsamic firs which grow on the crests of the mountains. Black Dome, or Mitchell's High Peak, is 6,770 feet high, the highest peak east of the Rockies, and is named after Dr. Mitchell of North Carolina University, who died while exploring the region, and who is there buried.

BLACK OAK, a handsome large tree of the United States (*Quercus tinctoria*), or, according to some botanists, a variety of *Quercus coccinea*. It yields a thick bark much used for tanning, and from which the yellow dye known as quercitron is obtained.

BLACK PRINCE, the popular title conferred upon Edward (1330–76), eldest son of Edward III. It is said, but not proven, that the name was given from the color of the armor worn by him. See EDWARD, Vol. VII, p. 686.

BLACK-QUARTER. See BLACKLEG, in these Supplements.

BLACK RIVER OR BIG BLACK RIVER, a stream 350 miles long which rises in Iron County, southeastern Missouri, flows at first southeastward and then southwestward into the White River at Jacksonport, in Arkansas, and, is navigable, when the water is high, for about 100 miles, by small river steamboats.

BLACK RIVER, of New York, about 125 miles long, rises in Herkimer County, flows in a northwesterly direction to the Great Bend in Jefferson County, whence it flows westward and empties into Lake Ontario, near Watertown. The Black River canal, between Lyons Falls and Rome, allows boats to pass from the river into the Erie Canal.—BLACK RIVER, Vermont, rising in the southwest part of Orleans County, Vermont, flowing north and eastward, entering Lake Memphremagog at Newport. A smaller river of the same name rises in Windsor County, in the southern part of the state, near Plymouth, flowing south by east and falling into the Connecticut River, opposite Springfield, in New Hampshire.—BLACK RIVER, Wisconsin, rises in Taylor County, north-central portion of the state, flows south through Clark County to Neillsville, from which point it begins to go westward, dividing Jackson County in its farther course to the southward, and falls into the Mississippi about 15 miles above La Crosse, its total length being about 200 miles.

BLACK RIVER FALLS, capital of Jackson County, western Wisconsin, on the Chicago and North-Western railroad, 55 miles S.E. of Eau Claire, and about an equal distance north of La Crosse. It lies on the Black River, which furnishes excellent water-power. It has water-works and electric light; its industries include flour-mills, wagon, sash and door manufacturing, etc. Iron ore is found in the vicinity, and pig-iron has been produced in the town. Population 1890, 2,261.

BLACK ROD, GENTLEMAN USHER OF THE. In England, an officer of the House of Lords, appointed by letters patent. He is chief gentleman usher to the sovereign, and usher of the Garter, at the chapter meetings of which he keeps the door. He has charge of all arrangements for keeping order in the House; takes into custody any peer guilty of breach of privilege; and (himself, or by his deputy, the yeoman usher,)

summons the House of Commons to the peers when the royal assent is given to bills, or when royal speeches are read. The appointment of messengers, door-keepers, etc., rests with Black Rod. His title is derived from the black rod which he carries as the symbol of his office. The name is also given to similar functionaries in the legislatures of the dominion of Canada and other British colonies.

BLACK ROOD OF SCOTLAND was a casket of gold, richly engraved and in the form of a cross, brought by Margaret, sister to Edgar Ætheling of England, when she became queen of King Malcolm III of Scotland, about the year 1067. The casket contained a splinter of the true cross, and to it was dedicated the abbey and palace of Holyrood, Edinburgh. The Black Rood was carried before the army of David II when he invaded England in 1346, and at the battle of Neville's Cross it fell into the hands of the English, who placed it in the shrine of St. Cuthbert, in the cathedral of Durham, from where it mysteriously disappeared at the time of the Reformation.

BLACKSBURG, a town in York County, northwestern South Carolina, at the junction of the Ohio River and Charlotte and Southern railroads, 28 miles N.E. of Yorkville. It is situated 1,500 feet above the sea-level, and is well sheltered from the north by the mountains behind it. It possesses rich resources in iron ore, both magnetic and hematite; plumbago, baryta, and silver, as well as springs of sulphur, lithia and magnesia. It has important industries connected with the development of its natural resources. Population 1890, 1,245, which is steadily growing.

BLACKSBURG, a village in Montgomery County, Virginia, about 75 miles S.W. of Lynchburg. It is the seat of the Virginia Agricultural and Mechanical College. Population, about 1,000.

BLACKSHEAR, capital of Pierce County, southeast Georgia, on Hurricane Creek, about 86 miles S.W. of Savannah, on the Savannah, Florida and Western railroad. It has industries of cottonseed-oil, feeding-cake, fertilizer, lint-cotton, turpentine, etc. Population 1890, 656.

BLACK SNAKE OR BLUE-RACER (*Bascanion constrictor*), a very large snake, common in the United States east of the Mississippi. It is bluish black in color, and moves with great swiftness. Poison-fangs are absent, but the snake is capable of exerting great constrictive force. Specimens are sometimes taken which are nine feet or more long.

BLACKSTONE RIVER, of north-central Massachusetts, rises in Worcester County and empties into Providence River, in Rhode Island, after having followed a southeasterly course. It measures about 75 miles, and furnishes water-power to several manufacturing villages.

BLACK VOMIT. See YELLOW FEVER, Vol. XXIV, p. 734.

BLACKWALL, suburban part of London, in Middlesex, England, at the junction of the Lee with the Thames; has foundries, ship-building yards, and the East and West India Docks. A railroad connects Blackwall with London, and to avoid the dangers and delay of the Thames River "pool," many passengers proceed by this railway to embark in steamers at Blackwall instead of going on board at London Bridge. A tunnel under the Thames connects both sides of the river. See BINNIE, ALEXANDER, in these Supplements.

BLACK WALNUT, the *Juglans nigra* of the United States. See WALNUT, Vol. XXIV, p. 333.

BLACK WARRIOR, a river of north-central Alabama, formed by the union of two forks—one the Locust Fork, rising in Blount County, and the Sipsey Fork, rising in Lawrence and Winston counties—the former the east and the latter the west forks of the river, which unite near the southern extremity of Walker, and the northwestern extremity of Jefferson counties, forming the boundaries between these counties in the directions named. The Black Warrior flows through Tuscaloosa County, and continues its course in a more southerly direction, forming the boundary of Greene and Hale counties, joining the Tombigbee River two miles north of Demopolis on the northern boundary of Marengo County. Along its banks is found bituminous coal. Its waters are navigable as far as Tuscaloosa; the length of the river is about 175 miles.

BLACK WATCH, the name given to the first of the Scottish Highland regiments, which had its origin in a commission granted to John, second Earl of Athole, in 1668, to raise and keep a sufficient guard for securing peace in the Highlands. The term *black* arose from the dark color of their tartan uniform, which distinguished them from the regular troops, called the *Saighdean Dearg*, or "red soldiers." Originally three companies, in 1729 the number was increased to six, and these formed into the Forty-second Regiment, under the command of the Earl of Crawford, in 1739. In 1743 they were marched to London, for the ostensible purpose of taking part in a royal review. Conceiving the king's departure for the Continent as an intentional slight, Lord Sempill's Highland regiment, as the Highlanders were then called, broke into mutiny the day after their review on Finchley Common by General Wade. Under the command of Corporal Samuel Macpherson, 150 Highlanders started to march for Scotland. They conducted their retreat with the greatest forbearance and military skill, but were surrounded at Oundle, in Northamptonshire, and compelled to surrender. Macpherson and his brother, with a private named Shaw, were tried by court-martial and shot, in spite of national sympathy with their fate. The regiment then joined the troops in Flanders and first went into action at Fontenoy, since which it has been one of the most distinguished corps in the British army. In 1872 the officers of the regiment erected a monument in Dunkeld Cathedral in memory of those who had fallen in battle from the raising of the regiment till the close of the Indian mutiny in 1859; and a memorial cairn, raised by public

subscription, was unveiled Nov. 13, 1887, in the field near Aberfeldy, where the regiment first assembled in 1739.

BLACKWATER, a name of five Irish rivers, one of which deserves notice—the Blackwater of Cork, which runs across Cork County in a Carboniferous limestone basin. High mountains bound it on the south, and its chief feeders come from the north. It is 100 miles in length, the seventh in size of the Irish rivers. The scenery along its banks is extremely beautiful and picturesque, with ruins, mansions and woods. It abounds in salmon.

BLACKWELL, ALEXANDER, adventurer, seems to have been born in Aberdeen about the beginning of the eighteenth century, and to have been a younger son of the Rev. Thomas Blackwell (1660–1728), principal of Marischal College. He may or may not have studied medicine under Boerhaave at Leyden, but about 1730 he was a printer in London, and becoming bankrupt in 1734, was supported in prison by his wife, who published a *Herbal* (2 vols., fol., 1737–39), with 500 cuts of plants, drawn, engraved and colored by herself, her husband adding their Latin names, with a brief description of each. Next, in 1742, Blackwell turned up in Sweden, where, having cured the king of an illness, he was appointed one of the royal physicians, and undertook the management of a model farm. While still in the full enjoyment of court favor he was charged with being concerned in a plot against the constitution, and after being put to the torture, was beheaded, Aug. 9, 1747, protesting his innocence to the last.

BLACKWELL, ANTOINETTE LOUISA BROWN, an American advocate of women's rights; born at Henrietta, New York, May 20, 1825. She graduated at Oberlin in 1847, and after studying and teaching, took a course of theology, which she completed at Oberlin in 1850, but upon applying for a license to preach, she was refused. She preached upon invitation and her own responsibility, and in 1853 was regularly ordained pastor of the Congregational Church at South Butler, Wayne County, New York, retaining her charge only a year. In 1855 she investigated the phases of vice in New York City. Next year she married Samuel C. Blackwell, brother of Elizabeth Blackwell. Mrs. Blackwell has since become a Unitarian, and a prominent champion of women's rights. Among her works are *Shadows of Our Social System* (1855); *Studies in General Science* (1869); *The Market Woman* (1871); *The Island Neighbors* (1871); *Sexes Throughout Nature* (1775); *Physical Basis of Immortality* (1876); etc.

BLACKWELL, ELIZABETH; born in Bristol, England, Feb. 3, 1821; came to the United States when a child, and having privately studied medicine, applied to the leading colleges for admission to their courses, but was refused, until in 1847 she was admitted to the college at Geneva, New York, and was graduated with honors in 1849, being the first woman to attain the degree of M.D. in the United States. She practiced medicine for many years; organized a woman's medical college in New York, and in 1857 founded the New York Infirmary for women and children. She has written on the *Laws of Life* and the education of children. In 1859 she delivered a series of lectures at the Women's Medical College, London, England. In 1868 she returned to London, where she settled, taking an active part in measures of sanitary reform, and in the work of the Women's Medical College.

BLACKWELL, LUCY STONE. See STONE, LUCY, in these Supplements.

BLACKWELL, THOMAS, scholar, was born at Aberdeen in 1701; was educated in his native town, graduating from Marischal College in 1718. In 1723 he was appointed professor of Greek in Marischal College, and in 1748 its principal. He died at Edinburgh, March 8, 1756. He was author of *Inquiry into the Life and Writings of Homer* (1735); *Memoirs of the Court of Augustus* (3 vols., 1752–64); and two or three other works.

BLACKWELL'S ISLAND, named after its former owners, is a part of New York City; it lies in the East River, and has an area of 120 acres. On this island are charity and fever hospitals, a penitentiary, insane asylum, asylum for the blind, and alms and work houses. A lighthouse is at its north end.

BLACKWOOD, WILLIAM, a Scottish publisher; born at Edinburgh, Nov. 20, 1776, at which place he settled as a bookseller in 1804. In 1817 he became a publisher on his own account, and issued the first number of *Blackwood's Magazine*. (See PERIODICALS, Vol. XVIII, p. 537.) The literary ability displayed in this periodical was so much in advance of that in the monthly magazines then existing that from the first it was a great success, and it secured for itself a wonderful reputation. He was himself chief manager of the magazine, and conducted the whole of the correspondence connected with it until his death, Sept. 16, 1834. Under his sons, the Messrs. Blackwood, who succeeded him in the business, *Maga* has increased its reputation, and the firm has widely extended its scope, being regarded as the leading publishing firm in Scotland.

BLACKWOOD RIVER, in West Australia, enters the Hardy Inlet 6 miles N.E. of Augusta. It flows through the counties of Durham and Nelson, first to the west, then to the south, traversing a district of wood and pasturage. It is navigable for boats to a distance of 20 miles.

BLADDER. See VESICAL DISEASES, Vol. XXIV, p. 188.

BLADDER-NUT, a genus of plants (*Staphylea*), the type of a small natural order (*Staphyleaceæ*). They are mostly trees or shrubs of elegant appearance, and the two species, *S. trifolia* and *S. pinnata*, are much used for ornamental planting. Inflated membranous capsules inclose the seeds and give the popular name to the trees. See ARBORICULTURE, Vol. II, p. 320.

BLADDER-SENNA (*Colutea arborescens*), a leguminous shrub of southern Europe, frequently cultivated. It owes its name partly to the dry,

inflated pod, partly to its popular use as a purgative. Also called "bastard senna."

BLADDER-WORM, the encysted larval stage of a tapeworm or cestode. The stage owes its name to the bladder-like form. See TAPEWORMS, Vol. XIII, pp. 52, 53.

BLADDERWORT (*Utricularia*), a genus of plants of the family *Lentibulariaceæ*, containing numerous species. Their bright blossoms, with those of the water-lilies, etc., adorn the surface of lakes, ditches and marshes in almost all parts of the world; they are particularly abundant within the tropics. The roots, stems, and even leaves, are furnished with numerous little bladders, which are filled with water, till it is necessary that the plant should rise for the expansion of the flowers, when they become filled with air; and this again gives place to water after flowering is over, so that the seeds are ripened at the bottom. The bladders have an orifice, closed by a very thin elastic valve opening inwards, and are found to act as traps for catching and retaining minute aquatic animals. The animals are macerated, and tufts of small hairs, lining the cavity of the bladder, act as absorbent organs of the food-material thus obtained.

BLADENSBURG, a village of Prince George's County, Maryland, situated on the eastern branch of the Potomac, about 6 miles N.E. of Washington. It was the scene of a battle fought Aug. 24, 1814, which resulted in the defeat of the Americans, and the capture and partial destruction of the city of Washington by the British. It is also noted as the birthplace of William Wirt. Population 1890, 503.

BLADEN SPRINGS, a village of Choctaw County, Alabama, situated near the Tombigbee River, about 85 miles N. of Mobile. It is noted for its copious medicinal springs. These are six in number, saline-chalybeate, and are highly valued for the curative effects of their waters in cases of dyspepsia, chronic rheumatism, and kidney and bowel complaints.

BLAEU, WILLIAM JANSSON, Dutch mathematician, map-drawer and publisher, born at Alkmaar, Holland, in 1571; died in 1638. His terrestrial and celestial globes excelled in beauty and accuracy everything that had preceded them. For description of his work, see GLOBE, Vol. X, p. 683. His son, JAN, commenced business on his own account at Amsterdam in 1637, but afterward entered into company with his brother, CORNELIUS (died 1650). He edited the well-known *Atlas Major*, in eleven volumes. This is a remarkable work, with many curious plates; and the maps are extremely valuable from the light they throw on local history. He further published a series of topographical plates and views of towns. Jan left three sons, two of whom carried on the business with success until about 1700. Some of their classical publications, especially Cicero's *Orationes* (1699) are highly prized.

BLAGOVIESHTSCHENSK, a town of the Amoor province of Siberia, at the confluence of the Amoor and Seja rivers. Till 1882 it was the capital of the province. Population, 20,200.

BLAIKIE, WILLIAM GARDEN, a Scotch Free Church minister; born at Aberdeen in 1820, and educated in his native town; ordained in the Scotch Church, he came out at the disruption in 1843, and became a pastor in the Free Church; later he was professor of apologetics and pastoral theology in New College and president of the Alliance of Presbyterian churches at Toronto in 1892. He edited several religious periodicals and wrote many devotional and theological works, among the best known of which are *Bible History; Better Days for Working People; For the Work of the Ministry; Personal Life of David Livingstone; Leaders of Modern Philanthropy.*

BLAINE, JAMES GILLESPIE, an American statesman; born of Scotch-Irish parentage at West Brownsville, Pennsylvania, Jan. 31, 1830. As a boy at school he excelled in literature and mathematics, and at the early age of 13 entered Washington College, in his native county, graduating in 1847. Subsequently he became a teacher in the military institute at Blue Lick Springs, Kentucky, where he married Miss Harriet Stanwood, a teacher in a neighboring seminary. Soon after his marriage he removed to Pennsylvania, and after studying law for a short time became a teacher in the Institution for the Blind at Philadelphia. In 1854 he removed to Augusta, Maine, entering the journalistic ranks, first as editor of the *Kennebec Journal*, and later as editor of the *Portland Advertiser*. In 1858 he was elected to the state legislature, and served two terms, officiating as speaker during the last two years. During the same year (1858) he was made chairman of the Republican state committee, which office he held for a score of years. In 1862 the Republicans elected him to the House of Representatives, and for 20 years he served in one or the other of the two Houses of Congress. During the war he favored all judicious and practical resolutions for its vigorous prosecution, and at its close he bore an active part in the reconstruction measures of the country. The Fourteenth Constitutional Amendment was called the "Blaine Amendment," as it was formulated and earnestly advocated by him. He was largely instrumental in the negotiation of a treaty with England, in which the doctrine of perpetual allegiance was abandoned, and Great Britain accepted the American principle of equal rights and protection for adopted as well as for native citizens. From 1869 to 1875 Mr. Blaine was speaker of the House of Representatives, and his record in this capacity is generally conceded to have been a brilliant one. As presiding officer he was



JAMES G. BLAINE.

distinguished for his knowledge of parliamentary law, his impartiality in administration, and his physical endurance. His course in connection with the general amnesty bill, which provoked stormy discussion in 1876, strengthened his influence in the Republican party. In the same year occurred the now historic incident of the "Mulligan letters." Mr. Blaine's vigorqus policy of governmental aid to the railroad development of the West produced many charges of corrupt dealings with railroad corporations. A resolution of the House of Representatives authorized the investigation of an alleged sale of some Little Rock and Fort Smith railroad bonds to the Union Pacific railroad. The resolution was supposed to be aimed at Mr. Blaine. In the course of its investigations the committee discovered the existence of a lengthy correspondence between Blaine and Mr. Warren Fisher of Boston, and also that an important series of letters of such correspondence had been obtained and were possessed by one Mulligan, a clerk. This person was summoned before the committee, but as soon as he reached Washington gave up the letters to Mr. Blaine, who, on June 5, 1876, produced and read them to the House, at the same time vehemently denouncing the Speaker, Michael Crawford Kerr, for suppressing an exonerating telegram from Josiah Caldwell, one of the promoters of the Fort Smith railroad. The excitement and reaction of the apparent vindication were too much for Blaine's system, sapped as his vitality had been by years of intense application. He was prostrated by extreme heat on his way to church the following Sunday, and for some time was in a critical condition.

In 1876 Mr. Blaine was elected to the United States Senate, and at once became a most prominent and efficient member of that body. In the Republican National Convention of that year he was a prominent candidate for nomination to the Presidency of the United States, and lacked only 28 votes out of a total of 754 of receiving the nomination. Then it was that Robert G. Ingersoll, in presenting his name as candidate, termed Blaine "the Plumed Knight," a soubriquet frequently applied in succeeding years. At the Republican National Convention in 1880 his friends again presented his name for nomination, and on the first ballot the vote stood: Grant 304, Blaine 284, Sherman 93, Edmonds 34, Washburn 30, Windom 10, Garfield 1. On the election of Mr. Garfield, Mr. Blaine accepted the appointment of Secretary of State, filling the office with rare ability and success, until the death of the President, when he retired from active public work, and began to write his famous historical work entitled *Twenty Years of Congress*. In 1884 Mr. Blaine received the Republican nomination for President, but after a vigorous contest, failing to secure the electoral vote of the state of New York by the narrow margin of 1,047 votes out of a total of over 1,200,000, he was defeated in the general election. He spent the ensuing four years at work on his book and in foreign travel.

At the time of the nominating convention in 1888, Mr. Blaine was in Europe, and by formal letter declined to permit his friends to present his name as a candidate for the Presidency. He returned, however, in time to aid efficiently in the canvass for Mr. Harrison, and on the election of the latter again accepted the appointment as Secretary of State. Among other important services rendered in this office he took a leading part in settling the Samoan difficulties in the treaty between Germany, England and the United States, and successfully invited and most efficiently presided over the Pan-American Congress held in Washington, and negotiated reciprocity treaties for the extension of trade with Germany, Spain and some of the South American republics. In June, 1892, Mr. Blaine resigned his office to become a candidate for the Republican Presidential nomination, but failed to receive it. He died at Washington, District of Columbia, after a long and severe illness, Jan 27, 1893.

BLAIR, a city and county seat of Washington County, Nebraska, and an important railroad center. It is situated about 3 miles W. of the Missouri River and 25 miles N.N.W. of Omaha. It has a large local trade and various important industries; contains a number of elevators, mills and wagon factories. Population 1890, 2,069.

BLAIR, Francis Preston, born at Abingdon, Virginia, April 12, 1791; died at Silver Spring, Maryland, Oct. 18, 1876. He early entered political life, and in 1829 was requested by the President to establish a Democratic newspaper in Washington which should be the organ of the party. In response Mr. Blair started the *Globe*, and conducted it till 1845. In 1854 he assisted in organizing the Republican party; in 1866 was a member of the Chicago convenion which nominated Mr. Lincoln, and after his election had considerable influence in the administration. He went South in 1864, and through personal influence tried to effect a peace with Jefferson Davis and other Southern leaders. The Hampton Roads peace conference of Feb. 3, 1865, was a result of his labors. After Lincoln's death he opposed reconstruction measures and gave his support to the Democratic party.

BLAIR, Francis Preston, Jr., son of Francis P. Blair, an American statesman and soldier; born at Lexington, Kentucky, Feb. 19, 1821; was a Princeton graduate, and began the practice of law in St. Louis in 1843; served in the Mexican War; was editor of the *Missouri Democrat*, and from 1852 to 1856 was in the Missouri legislature. He joined the new Republican party in 1856 and was sent to Congress. In 1862 he was re-elected. In 1861 he commanded an unauthorized force which guarded the St. Louis arsenal and took the state forces under General Frost, thus saving Missouri and Kentucky from the Confederates. He fought in the Civil War, and was raised to the rank of major-general. He was at Lookout Mountain, Missionary Ridge and marched with Sherman to the sea. After the war he left the Republican party, being dissatisfied with its policy, and in

1868 was a candidate for the Vice-Presidency on the Democratic ticket with Horatio Seymour. In 1871 he was elected to his state legislature and in the same month was elected by the Democrats to the United States Senate. He died at St. Louis, Missouri, July 8, 1875.

BLAIR, HENRY WILLIAM, born at Campton, New Hampshire, Dec. 6, 1834. He studied law, and in 1860 was elected prosecuting attorney of Grafton County. He enlisted in the Civil War, but at the siege of Port Hudson was so severely wounded that he was unable to engage in any further military service. He was from 1866 to 1869 in the New Hampshire legislature, served in Congress from 1875 to 1879; in the latter year was elected United States Senator, and served two terms. He was a strong advocate of prohibition and female suffrage. He was nominated minister to China, but the government of that country objected to receive him. At the general election of November, 1892, Mr. Blair was elected to the Fifty-third Congress.

BLAIR, JAMES, educator; born in Scotland in 1656; died in Williamsburg, Virginia, Aug. 1, 1743. He was a clergyman of the Episcopal Church, and spent most of his life in the colony of Virginia. He established the William and Mary College, having gathered funds for it, and secured the charter from the king. He was appointed its first president. Among his published writings, a commentary on the *Sermon on the Mount* was highly esteemed by his contemporaries.

BLAIR, JOHN INSLEY, capitalist; born in Warren County, New Jersey, Aug. 22, 1802. He has been an active business man, assisting in developing coal-mines in Pennsylvania; building the railroad between Owego and Ithaca, New York; building the Delaware, Lackawanna and Western railroad, and also assisting in laying roads in Iowa, Wisconsin, Kansas, Nebraska, Missouri and Texas. He was one of the original directors of the Union Pacific railroad.

BLAIR, MONTGOMERY, an American lawyer and politician; born in Franklin County, Kentucky, May 10, 1813; graduated at West Point; served in the Seminole War; held several judicial positions in Missouri and Maryland, and being appointed by Lincoln to the Cabinet as Postmaster-General, he instituted various improvements in his department—notably money-orders and railroad mail-cars. He was counsel for the slave in the celebrated Dred Scott case. After 1867 he lent his influence to the Democratic party. He died at Silver Spring, Maryland, July 26, 1883.

BLAIR-ATHOL, a village in the county of Perth, Scotland, situated at the confluence of the Tilt and Garry, 30 miles N.N.W. of Perth. Blair Castle, the seat of the Duke of Athol, is situated here. The larch trees surrounding it are remarkable alike for their enormous size and for the fact of their being among the first planted in Scotland. See LARCH, Vol. XIV, p. 311.

BLAIR-GOWRIE, a village of Perthshire, Scotland, very beautifully situated on the east side of a range of hills, on the right bank of the Ericht, 16 miles N.E. of Perth. It consists chiefly of one winding street. It has flax-spinning and weaving factories, driven by the Ericht, employing 700 to 800 hands. Pure white marble is found in the vicinity. Population, about 6,000.

BLAIRSVILLE, a village of Georgia, county seat of Union County, 90 miles N.E. of Atlanta. It is noted for its beautiful mountain scenery and for the marble and gold found in its vicinity.

BLAIRSVILLE, a city of Indiana County, Pennsylvania, situated on the Connemaugh River, and on the Pennsylvania railroad, 63 miles N.E. of Pittsburg. It has four iron furnaces, a rolling-mill, tanneries, and an extensive trade in coal, lumber, grain and pork. Population 1890, 3,126.

BLAKE, EDWARD, a Canadian statesman; born in Adelaide, Middlesex County, Ontario, Canada, Oct. 13, 1833. He graduated with honors from the University College of Toronto in 1857, and two years later was called to the bar. He was simultaneously a candidate for election to the House of Commons of the Dominion and the legislative assembly of Ontario. To the latter body he was elected, and soon became (1867) leader of the opposition. In 1871 he became premier of the Ontario legislature, holding office for one session and then resigning. Under the Mackenzie administration Mr. Blake held successively two important cabinet positions, and in 1878 became leader of the opposition in the Dominion Parliament. In 1892 Mr. Blake, who had withdrawn to the mother-country for the purpose, was elected to the British House of Commons as a Home Rule member for an Irish constituency.

BLAKE, ELI WHITNEY, an American inventor and manufacturer; nephew of the noted Eli Whitney, inventor of the cotton-gin; born in Massachusetts in 1795; educated at Yale, and for some time engaged with his uncle in the manufacture of arms; commenced in 1834 the manufacture of domestic hardware, and in 1857 invented the celebrated "Blake crusher" for the reduction of stone and mineral ores; died at New Haven, Connecticut, Aug. 17, 1886.

BLAKE, LILLIE DEVEREUX, author, and woman's suffrage advocate, was born in Raleigh, North Carolina, Aug. 12, 1835. She was married in 1855 to F. G. Q. Umsted, who died in 1859, and in 1865 to Grenfell Blake. She is president of the New York Woman's Suffrage Association.

BLAKE, WILLIAM PHIPPS, a distinguished mineralogist, was born in New York in 1826. He has written largely on scientific subjects and has been connected with many exploring expeditions. In 1861 he went to Japan and organized the first Japanese government scientific school. In 1864 he became professor of mineralogy in the college of California. In 1867 he prepared the report on precious metals for the government volumes on the Paris Exposition. He was the first to call attention to the platinum ores in the gold-washings of California and invented an automatic roasting-furnace. He is the author of *California*

*Minerals; Iron and Steel; Ceramic Art and Glass;* and other volumes.

BLAKELEY, JOHNSTON, an American naval officer; born near Seaford, Ireland, in October, 1781; was lost at sea in 1814. He came to this country with his father when he was a small child, and settled in Wilmington, North Carolina. In February, 1800, Blakeley obtained the appointment of midshipman in the United States navy; on Feb. 10, 1807, was made lieutenant, and in 1813 became commander of the brig *Enterprise*, employed in protecting our coasting trade. On July 24, 1813, he became master-commander, and in August assumed command of the sloop-of-war *Wasp*. On May 1, 1814, he sailed from Portsmouth, New Hampshire, on a cruise, and on June 28th, captured the British brig *Reindeer*. Blakeley saw fit to burn his prize at sea, and Congress awarded him a gold medal in recognition of his exploit. On September 1st he destroyed the brig *Avon*, and a few days later two other vessels were captured and scuttled; on September 21st he also took the brig *Atlanta*, which was sent to Savannah. For these gallant services Blakeley was made captain the same year. His vessel, the *Wasp*, was last seen and spoken at sea on October 9th. Probably she foundered in a gale.

BLAKELY, a village and capital of Early County, in southwestern Georgia; situated on the line of the Georgia Central railroad, about 50 miles W.S.W. of Albany. It has manufactures of turpentine, leather and lumber. The town possesses four newspapers and a bank, and is the center of an extensive agricultural district. Population 1890, 441.

BLAKESLEY, JOSEPH WILLIAMS, an English divine; born in London in 1808; educated at Trinity College, Cambridge, whereof he was chosen a fellow in 1831. Canon of Canterbury, 1863; was one of the revisers of the New Testament, 1870; and dean of Lincoln, 1872. He wrote several theological and educational works. Died at Lincoln, April 18, 1885.

BLANC, ANTHONY, a Roman Catholic archbishop; born in Surry, France, Oct. 11, 1792. He left his native country in 1817, a year after his ordination to the priesthood, and came to the United States; was created bishop of New Orleans in 1835, and archbishop in 1850. He founded a theological seminary, introduced several religious orders into his diocese, and was instrumental in founding many educational institutions and orphan asylums. He died at New Orleans, June 20, 1860.

BLANC, AUGUSTE ALEXANDRE PHILIPPE CHARLES, a French art critic, brother of Jean Joseph Louis; born at Castres in 1813, died in 1882. His contributions to various French periodicals on matters connected with art were numerous. He was the editor and principal writer of the very complete and extensive *History of the Painters of all the Schools*. His *Works of Rembrandt* has passed through many editions. He was director of fine arts in 1848 and in 1871.

BLANC, JEAN JOSEPH LOUIS (1811–82), French socialist and historian; born Oct. 29, 1811, at Madrid, where his father was inspector-general of finance under King Joseph. After finishing his school education, he went to study in Paris. For two years he was a private tutor at Arras, and in 1834 returned to Paris, where he contributed to various political papers, and where, in 1839, he founded the *Revue du Progres*, in which he first brought out his chief work on socialism, the *Organisation du Travail*, which in 1840 appeared in a separate form. See COMMUNISM, Vol. VI, p. 213. The book obtained for its author a wide, enthusiastic popularity among French workmen. Next, in 1841–44, Blanc published an historical work, entitled *Histoire de Dix Ans* (1830–40), which damaged the political prospects of the Orleans dynasty. (See SOCIALISM, Vol. XXII, p. 209.) He was accused of a share in the disturbances of the summer of 1848, and made his escape to London, where he spent many years. During his exile he devoted himself to political and historical literature. He completed his *Histoire de la Révolution Française*, and carried on a large correspondence for the French journals. On the fall of the empire Blanc returned to France, and was elected to the National Assembly in 1871. After 1876 he was member of the Chamber of Deputies. He died at Cannes, Dec. 6, 1882.

BLANC, MARIE THÉRÈSE, MME., best known by her pen-name "Th. Bentzon," a French gentlewoman of letters; born at Seine-Port, in the department of Seine-et-Marne, Sept. 21, 1840; gained renown by her romances and translations published in the *Revue Politique et Littéraire* and the *Revue des Deux Mondes;* in 1868 gave *The Romance of a Mute* to the world as her first book; followed it in rapid succession by 40 romances, of which *A Remorse* (1878), and *Tony* (1884) were crowned by the French Academy; rendered into French some of Bret Harte's California tales, and Ouida's *Two Little Wooden Shoes;* published two volumes of essays on the *Literature and Customs of Foreigners* and *Recent American Novelists*. One of her latest novels, *Jacqueline*, was rendered into English by Mrs. E. Wormeley Latimer in 1893. That year she visited the Columbian Fair in Chicago, and on her return wrote for the *Revue des Deux Mondes* a study of American women. She is fond of social problems and reforms, and writes cleanly and with sympathy in her novels concerning them.

BLANCHARD, EDWARD LAMAN, an English journalist; born in London, England, Dec. 11, 1820; edited *Chambers' Journal*, and wrote for many years for the *Daily Telegraph*. He also wrote the novels, *Temple Bar* and *The Man Without a Destiny*, and many farces, extravaganzas and fairy tales. To the younger generation of his day he was best known as the librettist for many years of the annual Covent Garden pantomime. He died Sept. 5, 1889.

BLANCHARD, ÉMILE, French naturalist, was born in Paris, March 6, 1819. He is a son of the artist, Theophile Blanchard. He made a special study of vertebrates, and gave much time to researches in general anatomy and physiology. In

1847 he was appointed an assistant in the Paris Museum, and in 1862 professor of zoölogy. He is a member of various scientific societies, of the Institute, of the Academy of Sciences, and is an officer in the Legion of Honor. His first work, *A Study of the Organisms of the Worm*, in 1854, gained for him much favor. Since then he has published *Natural History of Orthoptera, Neuroptera, etc.* (1840); *Catalogue of the Entomological Collection of the Museum* (1850); *Agricultural Zoölogy* (1854); *The Metamorphoses, Habits and Instincts, of Insects* (1867); and *The Life of Animate Beings, the Conditions of Life, and Origin of Being* (1888).

BLANCHARD, JEAN PIERRE (or, according to some authorities, BLANCHARD, FRANÇOIS), an early and noted French aeronaut; born at Andelys, department of Eure, France, in 1738; died in Paris, March 7, 1809. See AERONAUTICS, Vol. I, p. 190.

BLANCHARD, THOMAS, an American inventor; born at Sutton, Massachusetts, June 24, 1788. He was an inventor, and some of his inventions were a new method of making tacks by machinery, a machine for turning and finishing gun-barrels, and an improved form of steamboat to be used for ascending rivers which have a rapid current. He also invented a steam-wagon (before any railroad had been built), a method for bending heavy timber, and a machine for cutting and folding envelopes. He died at Boston, April 16, 1864.

BLANCHING, a process resorted to by gardeners to avoid certain secretions which, in ordinary circumstances, take place in the leaves of plants, and to render them more wholesome for food. Blanching is accomplished in various ways, as by drawing up earth to the plants when the lower part of the leaf or leaf-stalks alone is to be blanched; tying the leaves together, by which the inner ones are blanched, as is commonly done in lettuce, etc. Blanching, although so simple and easy, is of great importance in the art of gardening, and the usefulness of many plants, especially celery, very much depends upon it. In cabbage and some other plants, the leaves form themselves into compact heads, and there is a natural blanching or etiolation.

BLANCO, a town of central Texas, capital of Blanco County; it is situated near San Marcos station, on the International and Great Northern and the Missouri, Kansas and Texas railroads, 48 miles S.W. of Austin; has corn and flour mills, and is the center of a cotton, grain and live-stock district. Population 1890, 269.

BLANCO, CAPE, a remarkable headland on the west coast of Africa, the extremity of a rocky ridge (called Jebel-el-Bied), which projects from the Sahara in a westerly direction, and then, bending southward, forms a commodious harbor, called the Great Bay. Southward to the mouth of the Rio Grande the shores are of a sandy character, with a current tending southwest, and prevalent northeast trade-winds. On account of the deficiency of good harbors, the prevalence of west winds and other causes, the casualties to shipping are very numerous. The natives of the Canary Islands carry on a pretty lucrative fishery in the bay, in boats of from 100 to 150 tons burden. Cape Blanco, which is composed of mixed calcareous and silicious sandstone, was first discovered by the Portuguese in 1441.

BLAND, RICHARD P., American Congressman, was born at Hartford, Kentucky, Aug. 19, 1835, and received an academic education. Migrating to the West he became a lawyer at Virginia City, Nevada, and also an investor in local and California mines. In 1865 he returned to Missouri, finally settling down to his profession at Lebanon, and has been elected from that district successively to every Congress since the Forty-third. Mr. Bland became noted for his vehement advocacy of free coinage of silver, and was author of the "Bland Bill" of 1878.

BLAND, THEODORIC, COLONEL, an American colonial statesman; born in Virginia in 1742; an uncle of John Randolph of Roanoke; memorable as opposing Governor Dunmore, under the pen-name of "Cassius." He served in the Revolutionary army, and was a confidant of General Washington. With a brief intermission he was a member of Congress from 1780 until his death in New York, June 1, 1790.

BLAND, a village and capital of Bland County, in the southwestern portion of the state of Virginia, 16 miles N. of Wytheville station, on the Norfolk and Western railroad. It is also known as SEDDON, and is in an agricultural region. Population 1890, 350.

BLANDRATA OR BIANDRATA, GIORGIO, founder of Unitarianism in Poland and Transylvania; born in Saluzzo, in Piedmont, about 1515. He established himself as a physician at Pavia, but, on account of his heretical opinions, he was compelled to fly to Geneva in 1556. He went to Poland in 1558, hoping to find a greater freedom for thought and speech. In 1563 he became the favorite physician of John Sigismund, Prince of Transylvania. Here he spread his doctrine and formed a considerable party. He was, it is said, strangled as he slept, in 1590, by his nephew, whom he had threatened to disinherit for his attachment to the Roman Catholic Church.

BLANKENBERGHE, a village on the coast of West Flanders, nine miles N. of Bruges by rail. It has a harbor and a lighthouse, and the place is a popular summer resort. Population, 4,116.

BLANKENBURG, a town in the duchy of Brunswick situated on the Harz Mountains. It is walled, has a gymnasium and several charitable and educational institutions. Mining is the chief industry, iron, marble and dye-earths being abundant in the surrounding districts. Population, 3,600. On the lofty summit of Regenstein, half a mile distant, are the remains of a large castle, hewn out of the rock by Henry the Fowler in 919. Louis XVIII resided at Blankenburg, as Comte de Lille, from 1796 to 1798.

BLANKETEERS, the name applied to a body of Manchester operatives, who, on March 10, 1817, met in St. Peter's Field, intending to march thence

to London with a petition for Parliamentary reform. Each man of the company had a rug or blanket strapped on his shoulders, so that he might bivouac on the road if necessary. They meant to join a contingent at Derby, but, exciting as much and as ill-founded fear as the Chartists of later date, were speedily dispersed by the magistracy. They were imitators of the Russian "petitioners in boots" and prototypes of the Coxeyites of America.

BLANK VERSE, a verse without rhyme, and depending on meter alone. The classical productions of the Greek and Roman poets are composed on this principle. When the passion for imitating classical models set in, rhyme came to be looked upon as an invention of Gothic barbarism, and attempts were made in most countries to shake it off. The Italian and Spanish writers used blank verse as early as the beginning of the sixteenth century. The first blank verse in English is a translation of the second and fourth books of Virgil's *Æneid*, by the Earl of Surrey, who was executed in 1547. Its adaptation to the drama was at once felt, Christopher Marlowe, "the creator of English blank verse" employing it in his various dramas. (See MARLOWE, Vol. XV, p. 556.) It soon became, and has continued, dominant in that department; but in other kinds of poetry it was not till the appearance of *Paradise Lost* (1667) that it could be said to have taken root, and even then the want of rhymes was felt, as the poet expected it would be. Many poets have since followed Milton's example. Some would restrict the name to lines of 10 syllables, not considering it applicable to such meters as Southey's *Thalaba* and Longfellow's *Hiawatha*. In Italian and Spanish it never became popular, still less in French. The German language seems to admit of every variety of blank verse.

BLANQUI, JÉRÔME ADOLPHE, one of the first French economists, was born at Nice in 1798. He was educated at the Lyceum of Nice, which city his family quitted in 1814, and he went to Paris to complete his studies. In 1825 he was appointed professor of history and of industrial economy in the Commercial School at Paris. In 1838 he became a member of the Academy of Moral and Political Science. The Academy sent him to Corsica to study the condition of that country, and afterward to Algiers and Turkey. He was requested to furnish a complete account of London in its financial and other aspects. In method he was ingenious; in style, lucid and forcible. Discussions became interesting from his lively mode of treating them. As a national economist he was somewhat inclined to socialism; he was also in favor of free trade. He wrote an excellent *History of Political Economy in Europe* (1838). Died at Paris, Jan. 28, 1854.

BLANQUI, LOUIS AUGUSTE, a French communist, brother of the preceding; born at Puget-Théniers, Alpes Maritimes, France, Feb. 7, 1805; originally intended for the legal profession, he associated with the extreme wing of the revolutionary party, and before attaining his majority had suffered his first imprisonment. In 1827 he was wounded in another uprising, a fate which also overtook him in the revolution of 1830. For his leadership in the insurrection of the Montagnards he was sentenced to perpetual imprisonment, but obtained his release at the revolution of 1848. The same year he organized another insurrection, whose object was the overthrow of the National Assembly. He was taken and promptly condemned, his sentence being 10 years at Belle Isle. Exile and imprisonment alternated until the insurrection of the Commune in 1871, when Blanqui's participation was pronounced, but brief. He was captured by the Versaillists, who refused to exchange him for the Archbishop of Paris. Escaping a death sentence by chance rather than by evidence, he was condemned to deportation to New Caledonia for life, though this sentence was modified to imprisonment at Clairvaux on account of his years; released in 1879, his radical Republican friends at Bordeaux elected him to the Chamber of Deputies as soon as the prison gates clanged behind him; the Chamber refused to ratify the election, and Blanqui dwelt in obscurity until his death, in Paris, on Jan. 1, 1881.

BLANTYRE, a mission station in the valley of the Shire River, near Lake Nyassa, East Africa, named after Blantyre, Lanarkshire, Scotland, and in honor of the missionary explorer, David Livingstone, whose birthplace was at Blantyre. The station was founded in 1876 by the Established Church of Scotland, and has already become a trade center.

BLAPS (*Blaps mortisaga*). See COLEOPTERA, Vol. VI, p. 133.

BLÄSER, GUSTAV, a German sculptor, born at Düsseldorf in 1813. He is best known in this country by his bust of Humboldt in Central Park, New York. Other principal works are his *Minerva Leading a Young Man to Battle*, on the Castle Bridge at Berlin; the *Francke Monument*, at Magdeburg; a statue of Duke Albert, for Marienburg; several statues of Frederick William IV, for different places. His last work was an equestrian statue of Frederick William III, for Cologne. He died in 1874.

BLASHFIELD, EDWIN HOWLAND, an American artist; born in New York in 1848; his early art-training was in Paris, under Bonnat, and one of his best efforts, *The Emperor Commodus Leaving the Amphitheater at the Head of the Gladiators*, was a feature of the Paris Salon of 1878. His *Treasure-Trove*, exhibited at the Centennial Exposition in 1876 at Philadelphia, and his beautiful allegorical painting, *The Story of the Christmas Bells*, which adorned the Art Palace at the World's Columbian Exposition of 1893, are two of his finest works.

BLASPHEMY. In the United States blasphemy has been made the subject of statutory enactments by several of the individual states. These enactments, however, are little more than confirmations of the common law and the older statutory laws of England. Profanity is generally classed by these state laws with blasphemy as an indictable offense. See BLASPHEMY, Vol. III, p. 807.

BLASS, FRIEDRICH WILHELM, a German classical scholar; born in Osnabrück, Jan. 22, 1843; one of the professors of the University of Kiel, and in 1892 at Halle University; his critical works on ancient Greek, notably his *History of Ancient Eloquence*, and *Die Aussprache des Griechischen*, and his editions of Greek classics have familiarized Professor Blass to all scholars.

BLAST-FURNACE. See IRON, Vol. XIII, pp. 297 et seq., and in these Supplements.

BLASTODERM, an embryological term applied to the layer or layers of cells arising from the germinal disk, or the portion of a partially segmenting egg which undergoes division. See EMBRYOLOGY, Vol. VIII, pp. 163–167.

BLASTOIDEA, a group of fossil echinoderms belonging to the sea-lilies (*Crinoidea*). They are found in the Upper Silurian, but reached their culmination in the Carboniferous. See ECHINODERMATA, Vol. VII, p. 638.

BLATCHFORD, SAMUEL, an American jurist; born in New York, March 9, 1820; graduated at Columbia in 1837, and in 1842 was admitted to the bar. He was law partner of William H. Seward; in 1867 became United States district judge for southern New York, and in March, 1882, associate judge of the supreme court of the United States. He died July 7, 1893.

BLAUWBOC (*Hippotragus leucophæa*), a large South African antelope, sometimes known as bluebuck or blue antelope.

BLAVATSKY, HELENE PETROVNA, theosophist; born in Ekaterinoslav, southern Russia, about 1831. Colonel Peter Hahn was her father; on her mother's side she was connected with the princely house of Dolgoruki. General Nicephore V. Blavatsky, deceased, a former governor of Armenia, was her husband. He was 60 and she 17 when they were married, and after three months of stormy existence, they separated by mutual agreement. She traveled extensively and studied the mysteries of Buddhism in a Himalayan mountain retreat. In 1870 she returned, stopping first at Cairo, Egypt, later in England, and in 1873 in New York, where she wrote and published *Isis Unveiled*, and founded the Theosophical Society, of which Col. F. P. Olcott was president, and Madame Blavatsky secretary. From there she went to London; founded a magazine, *Lucifer*, which, in conjunction with Annie Besant, she continued to publish till her death. She also wrote *The Secret Doctrine*, *The Key to Theosophy*, and *The Voice of Silence*, which were much esteemed by her disciples, and continued to teach the occult doctrines of the adepts, claiming that she had found in the Mahatmas, or intelligent consciousness of the spiritual world, the greatest aid to perfect life. She died in London, May 8, 1891.

BLAYE, a fortified seaport of France, in the department of the Gironde, 20 miles from Bordeaux. It is defended by two forts. The port of Blaye is a very busy one, all inward-bound vessels being required to anchor and deliver the manifests of their cargoes, and many outward-bound lay in their provisions here. It has manufactories of linen and woolen, glass and earthenware, a considerable export trade in corn, wine, brandy, oil, fruits, soap, etc., and tribunals of jurisdiction and of commerce. It has a strong modern citadel, theater, hospital, agricultural society, etc. Population, 4,765.

BLAZON, BLAZONRY. See HERALDRY, Vol. XI, p. 705.

BLEAK (*Alburnus lucidus*), a small European fresh-water fish of the family of *Cyprinidæ*, of the same genus with the dace, minnow, etc.

BLEDSOE, ALBERT TAYLOR, born in Frankfort, Kentucky, Nov. 9, 1809; died in Alexandria, Virginia, Dec. 8, 1877. He graduated at West Point, served on military duty in the Indian Territory, followed the teaching profession at Kenyon and subsequently at Miami; studied theology and preached for various churches (1835–38); studied and practiced law (1838–48); taught mathematics in the University of Virginia (1854–61); entered the Confederate army, and was made Assistant Secretary of War. In 1866 he began the publication of the *Southern Review*, the organ of the Methodist Episcopal Church in the South. He wrote for various publications and published several books.

BLEIBACH, a town of Austria, in the province of Carinthia, situated in the valley of the Drave, near the celebrated Bleiberg (Lead Mountain). The inhabitants are chiefly engaged in mining, and in washing and smelting the ore, of which from 1,500 to 1,800 tons are annually obtained. Population, 5,600.

BLENDE, a name applied to a number of minerals composed chiefly of sulphur and certain metals, almost all of splendid luster, but more exclusively to garnet or zinc-blende. It is abundant in primitive and secondary rocks in many parts of the world, and is often associated with galena or lead-glance. It contains about sixty-six parts of zinc and thirty-three of sulphur. See MINERALOGY, Vol. XVI, p. 392; also ZINC, Vol. XXIV, p. 785.

BLENEAU, a village in the French department of Yonne, situated 29 miles S.W. of Auxerre. Here Turenne gained a victory over the Prince de Condé in 1652. Population 1891, 2,084.

BLENHEIM, a village of Harwich township, Kent County, in the province of Ontario, Canada; the principal bean market of Canada, and the center of a rich agricultural district. The town is well supplied with natural gas, and is situated 12 miles from Chatham and 75 from London; Population 1895, 2,100.

BLENHEIM, capital of Marlborough district, New Zealand, situated on the Wairau River, at the junction of the Opawa and Omaka, both navigable for small vessels. It is 20 miles S. of Pictou by rail. It is an important shipping-point. Large quantities of hides, wool, tallow and flax are shipped by water to Port Underwood. Population, about 4,000.

BLENHEIM DOG OR MARLBOROUGH DOG, a small spaniel, much resembling the King

Charles breed in form and general appearance, but differing in the color, which is white, with orange or flame-colored markings. In weight it should not exceed five pounds. The Blenheim spaniel is the *Pyrame* of Buffon. It derives its English name from Blenheim Palace, in Oxfordshire, where the breed was a favorite one from the beginning of the eighteenth century.

BLENNERHASSETT, HARMAN; born in Hampshire, England, Oct. 8, 1764; died on the island of Guernsey, Feb. 1, 1831. He was educated at Westminster School, London, and at Trinity College, Dublin; later he studied law, and in 1790 received the degrees of B.A. and LL.B. After spending several years in European travel, he was married to Miss Agnew, daughter of the governor of the Isle of Man, sold his property, and in 1797 sailed for New York City. A year later Blennerhassett purchased Backus Island, in the Ohio River, which thereafter became known by his name, improved the grounds, and erected a handsome villa that was stocked with a library, works of art, and scientific apparatus of various kinds. In 1805 Aaron Burr, on his way down the Ohio and Mississippi rivers, visited him and succeeded in interesting Blennerhassett in his schemes. He published a number of communications in the *Ohio Gazette*, advocating the plans of Burr, and contributed considerable money for boats, arms, provisions, etc., with which to begin the enterprise. Soon afterward President Jefferson issued a proclamation against the scheme, and Blennerhassett, fearing arrest, left the island to join Burr at the mouth of the Cumberland River. Simultaneously his island was overrun by a party of militia under Colonel Phelps, who recklessly damaged house and property. On the failure of Burr's scheme, Blennerhassett was arrested, but discharged; on his way home he was again arrested and imprisoned. From Lexington, Kentucky, he was taken to Richmond, Virginia, for trial. As the government failed to make out a case against Burr, he was discharged in 1807. Meanwhile his estate had been seized by his creditors, and his mansion was used as a storehouse; shortly afterward the dwelling was burned to the ground. Blennerhassett then went to Natchez, Mississippi, where he bought 1,000 acres of cotton-lands near Port Gibson, Mississippi. This venture, with several others, proved unsuccessful, and in the War of 1812 his means were further diminished. In 1819 he removed to Montreal, where he vainly endeavored to acquire a legal practice. In 1822 he sailed for Ireland, and after many unsuccessful attempts to gain a livelihood, he died in neglect and obscurity on the island of Guernsey.

BLENNORRHŒA, in pathology, a term applicable to an abnormally copious discharge from any mucous surface, but usually restricted to discharges from the genito-urinary mucous membrane.

BLENNY, a popular name of fishes of the genus *Blennius*. They live near the shores of warm seas. Some of them are viviparous. See SEA-WOLF, Vol. XXI, p. 614, and ICHTHYOLOGY, Vol. XII, p. 690.

BLÉRÉ, a town of France, in the department of Indre-et-Loire, situated on the left bank of the Cher, which is crossed by a bridge, said to owe its origin to Henry II of England. In its vicinity is the castle of Chenonceaux, the residence purchased by Henry II of France for the celebrated Diane de Poitiers. The castle escaped the fury of the revolution, and is still in a good state of preservation. Among the curiosities shown to the visitor is the mirror used by Mary Stuart (Queen of Scots) on her marriage with the Dauphin. Population, 3,561.

BLESBOK (*Gazella albifrons*), a species of antelope nearly allied to the springbok, and inhabiting the plains of central and southern Africa. It derives its name from the white blaze or streak on its face, termed *bles* by the early Dutch settlers of South Africa.

BLESSED THISTLE, a name given to the *Cnicus benedictus* of Europe on account of its supposed medicinal value, for which it was held in veneration. It has much branched woolly stems, rather small heads of yellowish flowers, and pale pinnatifid leaves with slightly prickly edges.

BLETCHINGLEY, a town of Surrey, 20 miles S. of London. From 2,000 to 3,000 tons of fuller's earth are mined annually near Bletchingley. In cutting the railway tunnel the fossil bones of the iguanodon, an extinct reptile, were found here; also many Roman coins have been found in the vicinity. Population, about 2,000, chiefly agriculturists.

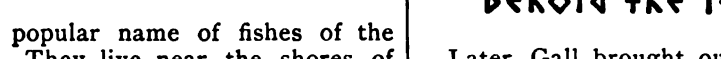
BLETS, decayed spots in apples, pears and other fruits. This decaying is often called *bletting*. It takes place chiefly by the decomposition of the protein compounds which the fruits contain, and the fermentation of the sugar; carbonic acid is formed, and by the microscope there may be discovered the fibers of a fungus pervading the bletted part.

BLIGH ISLANDS, that portion of the Fiji archipelago originally discovered by Tasman in 1643, and seen by Captain Bligh of the *Bounty* during his wonderful voyage in an open boat. The group lies in nearly 180° L., and 15° 30′ S. L.

BLIGHT. See FUNGUS, Vol. IX, pp. 827–36; see also MILDEW, Vol. XVI, pp. 293, 294.

BLIND, BOOKS FOR THE. (For general article on the BLIND, see Vol. III, pp. 826–833.) The first printed book for the blind was brought out in 1784 by M. Valentine Haüy of Paris. Haüy cast fonts of types which were approved by the French Academy of Sciences, and exhibited them to the royal family at Versailles, the new art producing a great sensation.

Mr. James Gall of Edinburgh brought out, in 1827, a triangular modification of the common alphabet, of which the following is a specimen:



Later, Gall brought out other volumes in serrated letters, of which the following is a specimen:

Behold the Lamb of God

The following is a specimen of the type used in 1834 by Dr. Samuel G. Howe of Boston, and this was the style of letter used later by the American Bible Society in printing its copies of the Scriptures for the blind:

behold the lamb of God

In 1837 Mr. John Alston of Glasgow began the printing of the Bible in the following letter:

BEHOLD THE LAMB OF GOD

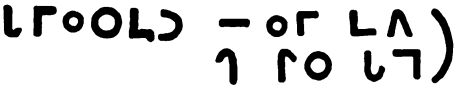
Nearly simultaneously with the above, Mr. Lucas of Bristol, England, brought out a book for the blind, using an ingenious system of stenographic letter, of which the following (the words are, "Behold the Lamb of God") is a specimen:



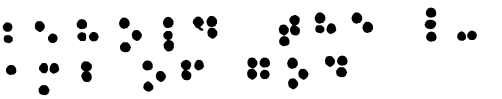
Soon after Mr. Frere of London, an instructor of the blind, devised another character system, which he described as "a scientific representation of speech, the alphabet containing only one character for each of the simple sounds in the English language." It was also received with much favor, and in 1839 the Bible was printed in that new letter. The following is a specimen:



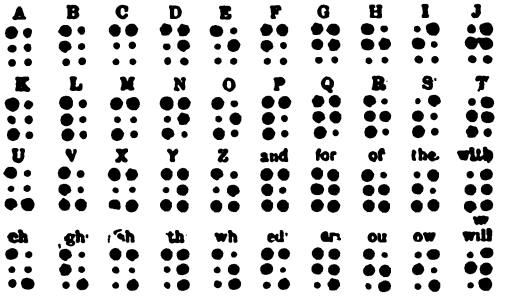
Dr. Moon of the blind asylum at Brighton, England, modified the Frere system, introducing radical changes. Some of his characters resemble the letters which they are designed to represent. The characters are also considerably larger than those of Frere. The following is a sample:



Another system, invented in 1834 by M. Braille, first a pupil, and then a teacher, in the Institute of Paris, is now largely in use in France, Switzerland, Belgium and Holland. It consists of the 62 combinations of form which six dots, ⁘, can be made to assume. The following is a specimen representing the phrase (selected for each of the representations given above), "Behold the Lamb of God."



This method had two special advantages to commend it: First, it can easily be written by the blind themselves, by the use of a simple apparatus since invented; and, second, it presents a good method of writing and printing music for the blind. The complete alphabet of this system is shown in the following illustration, in which the large dots only represent the raised characters used, the small points being inserted merely to show the correct position of the others in the line:



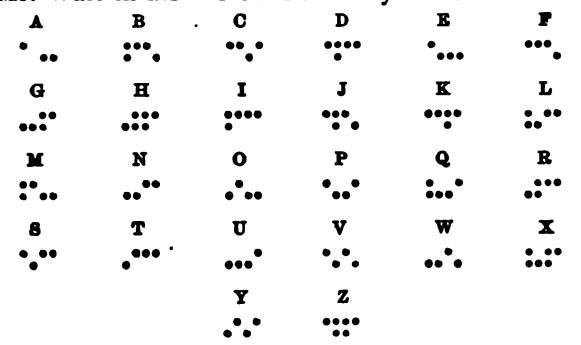

It will be noted that the varying possible combinations of the six dots, or points, are not only sufficient to cover the alphabet proper, but also to provide for diphthongal and other sound representatives.

Another system, possibly suggested by that of Mr. Braille, but differing from it in several important particulars, was some years ago devised by Mr. W. B. Wait, superintendent of the New York Institution for the Blind. Relief or raised dots are used, but they are in two lines instead of three, and the combination letters are grouped in a much simpler form than in the Braille system. The full alphabet (lower case) is shown in the subjoined table of arbitrary sign alphabets, where it appears under the name of the New York system, a name modestly given to it by Mr. Wait:



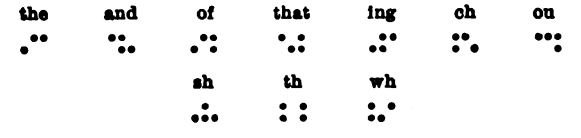

In the first three alphabets shown above no distinction is made between small (lower case) and capital letters; but the New York or Wait system provides not only for the small letters (shown above), but has also a distinct and complete alphabet of capitals for those who desire to use them. The capital letters are derived from the small letters by suffixing to each of them *as many*

*points* as will form a new character *four points* in length, in the following manner: (1) When the small letter ends with a point (or dot) in the upper of the two rows, as in the letter "a," add the suffix in the lower row; and (2) when the small letter ends with a point in the lower row, as in "c," or in both upper and lower rows, as in "d," add the suffix in the upper row. The following is the complete alphabet of capitals, as given by Mr. Wait in his "New York" system:

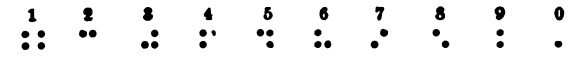



Wr. Wait's system furnishes a list of *word* and *part-word* signs, and also signs for *numerals* and *punctuation* marks, as follows:

WORD AND PART-WORD SIGNS.




NUMERALS.




Prefix, indicating that the characters which follow are numerals ⠼ The decimal point is ⠨

PUNCTUATION MARKS.

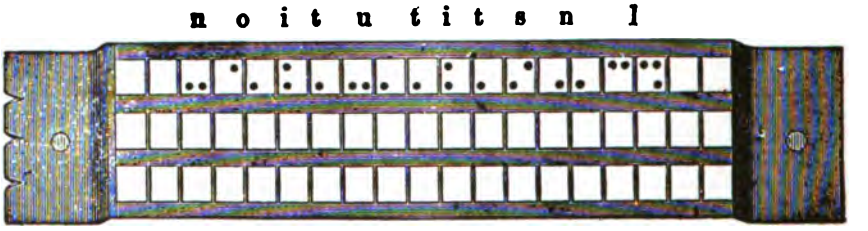
Period, ⠲, or a blank space equal to five points in length.

Comma, ⠂, preceded and followed by a blank space equal to two points.

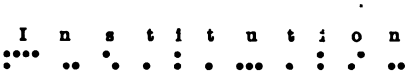
Semicolon, ⠆, preceded and followed by a blank space equal to two points.

| | | | |
|---|---|---|---|
| Colon | ⠒ | Exclamation | ⠖ |
| Apostrophe | ⠄ | Asterisk | ⠔ |
| Hyphen | ⠤ | Quotation | ⠶ |
| Interrogation | ⠦ | Dash | ⠠⠠ |
| Parenthesis | ⠐ | | |

Writing for the blind is done by means of a style which, being pressed vertically on prepared paper laid over "dot grooves" in a tablet, thus forming on the under surface of the paper the desired raised signs. In order to secure neatness, exactness, and dispatch in writing, a piece of apparatus was invented by Mr. Wait, called a "guide," and partially shown in the accompanying cut. It consists of two metallic tablets fastened together with hinges at one end. The upper one, fully illustrated in the cut, is substantially a frame with three rows of rectangular openings, each sufficiently wide to include two rows of dot signs, or one full line of sign letters. The under tablet, not shown in the cut, contains six parallel rows of dot grooves so arranged that all the grooves, when the upper frame is shut down, will be directly under the corners of the rectangular open spaces. The paper being placed between the tablets and the latter closed, the writer, with the style in hand, presses the prepared paper into the grooves so as to make the raised letters beneath.




The writing is executed from *right to left*, so that the "raised" letters, which at first are on the under side, may read correctly from *left to right*. Thus, in the cut, the word *institution* appears as if written backward; but when completed, and the paper turned for the reader, it appears thus:




This New York system of Writing and reading for the blind is rapidly winning its way in many sections of the United States, and has also been successfully introduced into several other countries. Its principal publishing-house is in Louisville, Kentucky, from which numerous publications for the blind have issued—books for schools (primary and graded, including those for academic classes); books for home miscellaneous reading, and books for students in music. The writer of these paragraphs has now on his table a volume entitled *A Practical System of Tangible Musical Notation and Point Writing and Reading for the Use of the Blind*, by William B. Wait, and also a copy of the current series of *International Sunday School Lessons for the Blind*, sent out monthly by the publishing house in Louisville, for the supply of the blind pupils in Sunday schools.

BLIND, KARL, an eminent German politician; born at Mannheim in 1820. He was prominent as an agitator in connection with the revolutionary movements of 1848 and 1849, and in 1852 he

fled to England. He was pardoned by the government, and in 1867 he returned to Germany. He is known in this country as a contributor to magazines and reviews, and as a zealous opposer, for many years, of the policy of Bismarck.

BLINDAGE, in military language, a screen made of trees or earth and timber used to protect from the enemy's fire a garrison, men at work in a trench, or gunners in a battery. In field and temporary fortifications a blindage is usually made with willow osiers and is called blind osiers.

BLIND-STORY, in mediæval church architecture, the triforium; q.v., under ARCHITECTURE, Vol. II, p. 475.

BLINDWORM OR SLOW WORM, a popular name of the lizard (*Anguis fragilis*), which is neither blind nor a worm. See LIZARD, Vol. XIV, p. 735.

BLISS, CORNELIUS N., American merchant and politician, born at Fall River, Massachusetts, in 1833, lived in New Orleans in boyhood, later entered a Boston commercial house, and in 1866 removed to New York City. He was early interested in manufactures, became a leader in the mercantile world, and arose to political prominence as treasurer of the Republican National Campaign Committee. He is head of the wholesale house of Bliss, Fabyan and Co., and holds the position of director in several banks, trust, and insurance companies. In 1897 Mr. Bliss was appointed Secretary of the Interior.

BLISS, PHILIP PAUL, singing evangelist; born in Clearfield County, Pennsylvania, July 9, 1838; killed in the railroad disaster at Ashtabula, Ohio, Dec. 29, 1876. He had but little education, but his fondness for music led him to gain what knowledge he could of this art by attending conventions and the Academy of Music at Geneseo, New York. After the war, to which he was drafted in 1864, he held musical conventions and composed numerous songs. He became acquainted with D. L. Moody, and was persuaded to devote his life to evangelical work. His labors were in constant demand throughout the United States and Canada. He was a man of considerable personal magnetism, was a ready speaker and possessed a sweet, sympathetic voice in singing. His singing was not scientific, but exerted a powerful influence on a miscellaneous audience. He published several collections of songs. Among his most famous songs are *Hold the Fort; Pull for the Shore;* and *Down Life's Dark Vale We Wander.*

BLIZZARD, a fierce storm of bitter, frosty wind, with fine, blinding snow, in which, especially in the Western states of the American Union, man and beast often perish. In one which visited Dakota and the states of Montana, Minnesota, Nebraska, Kansas and Texas in January, 1888, the mercury fell within 24 hours from 74° above zero to 28° below it, in some places, and in Dakota went down to 40° below zero. Some 235 persons lost their lives. This was the worst storm since 1864; the Colorado River, in Texas, was frozen with ice a foot thick, for the first time in the memory of man, and desolation and death were on every hand. Really disastrous blizzards are rare, those of 1836, of December, 1863, January, 1866, January, 1873, being, till that of 1888, the severest on record. The word is a popular formation, originating in the United States, and seemingly akin to *blast, bluster.* The term was in colloquial use in the West early in the century, but first became usual throughout the United States during the severe winter of 1880–81.

BLOCH, MAURICE, a Hungarian philologist, better known in his native land by his Magyar name of Ballagi; born at Ternova, April 17, 1815, of indigent Hebrew parents, he procured an education at Budapest and Paris, only by severe exertions; went to Tübingen University in 1840, and became a Protestant; chosen one of the professors at the University of Szarvas in 1844; he was, in 1848, secretary for General Georgei and for the Hungarian Minister of War. He returned to his pupils in 1857 and was for over 20 years their teacher. His *Books of Moses and Joshua* (1840–45), in the Magyar language; *Magyar Anthology* (1847); and *Collection of Magyar Proverbs* (1850), with many philological works, have made him a recognized authority on the Magyar tongue.

BLOCK, MAURICE, statistician; born at Berlin, of Jewish family, Feb. 18, 1816, and studied at Bonn and Giessen. He settled at Paris, where for a time (1852–62) he held a post in the statistical bureau. He has published many works on the statistics of France and Europe, including the *Annual of Political and Statistical Economy* and *The Population of the French Empire* (1861).

BLOCKADE, in international law, means the investment of a port or place by a hostile force or fleet sufficient under ordinary circumstances to make it dangerous for merchant vessels to attempt to enter. To constitute a blockade it is necessary that such force be continually near enough to the port to cut off any attempted communications. But a mere accidental absence of the vessels, as when driven out by storm, will not be sufficient to warrant a neutral to enter. The right to declare and carry on war carries with it the right to destroy or capture the enemies' citizens or goods, and imposes upon all neutrals the obligation not to interfere with such right. Incident to the right of waging war is the right to blockade the enemies' ports, and when done, all neutrals must respect the blockade. A violation of this right subjects the ship and her cargo to the liability of capture and confiscation at any time prior to the completion of her return voyage, but no longer. The owner of the cargo may show, however, that the vessel was not violating the blockade for the benefit of the cargo, and may thus prevent its confiscation. The right of blockade is a sovereign right, but a direct declaration of a blockade by the sovereign power of the state is not always necessary. It may be done by a naval officer or his superiors without governmental notification. To constitute a blockade, notice must be given to those who are expected to observe it. This notice may be given directly to the commanding officer of the vessel, or to his govern-

ment, or constructively by the notoriety of the fact.

BLOCKBOOKS AND BLOCK-PRINTING. See BIBLIOGRAPHY, Vol. III, p. 652.

BLOCKHOUSE, a small fort constructed of hewn timber, sufficiently thick to be bullet-proof, and provided with loopholes for musketry. A blockhouse may be of one or more stories, and of any size and shape. When of more than one story, the upper is made to project over the lower, to enable the occupants to fire through loopholes in the floor. In localities where timber is plentiful, and an artillery attack not to be feared, it forms a useful defensive work, and under these conditions it is often used in a rough country. Blockhouses were the first defensive works raised by the pioneers of the United States as they pushed westward and encountered the Indians. When a blockhouse stands alone it constitutes an independent fort, and forms a barrack for its garrison.

BLOCK ISLAND, formerly called Manisees, situated in the Atlantic, about 9 miles S. of Rhode Island, to which it belongs. It is about 8 miles in length, has a lighthouse at its north end, constitutes the township of New Shoreham, in Newport County, and contains New Shoreham, a summer resort. Population 1890, 1,320.

BLOCKSBERG, the name given to various mountains and hills in Germany, but pre-eminently to the Brocken, the highest of the Harz Mountains. According to the popular belief, it is the favorite haunt of the witches, where they celebrate *Walpurgisnacht* on the 1st of May.

BLOCK SYSTEM. A term applied to an arrangement of signals by which two railroad trains on the same track may be kept a certain distance apart. To its inception and use as described under RAILWAYS (q.v., Vol. XX, p. 238), may well be added the results of recent invention and America's progress in this regard. In England as early as 1853, the necessity for some safer system of signaling than the time interval afforded was felt so much that many of the lines adopted the absolute block system at an early date. While in theory perfect, if absolute freedom from error could only be guaranteed in the human beings who operate it, Tyer's patent system, which is the one in general use, has the disadvantage of requiring a heavy outlay for labor, as it requires at least two operators, or signalmen, for every few miles of road, with a third man for every four or five signal-towers to fill a place vacant by sickness, and to enable the regular men to change from day duty to night duty. At the present day 98 per cent of the double-track lines in that country are operated under the absolute block system, and under a recent act of Parliament the Board of Trade has issued a circular requiring its adoption on all passenger lines. The English, or absolute, block system has been introduced on a few American railroads. To avoid the heavy labor expense, several electrical systems of block-signaling have been devised. Among the principal systems are the Hall signal, the Sykes lock and block system, the Westinghouse system of pneumatic interlocking signals, and Black's mechanical block signal. Of these, the system named after Thomas S. Hall of Connecticut, invented by him as early as 1866, and in use on New England roads from 1871, may be detailed as representative, in general use, and working with mathematical and almost unerring accuracy. The Hall is a wire-circuit system, the circuit being normally closed. As, a train proceeding from A to B passes the Hall signal semaphore at station A, the wheels set this semaphore at "danger." At danger it remains until the train reaches B, then a current of electricity passing from a signal there, through the car-wheels and axles, is transmitted back to station A, and once more sets the semaphore there at "clear." By a similar set of instruments bells can be set ringing at highway crossings by an approaching train, and with the use of the Hall signal the danger of rear-end collisions is practically reduced to a minimum.

BLOCK-TIN. See TIN, Vol. XXIII, p. 401.

BLODGETT, HENRY WILLIAMS, an American jurist; born in Amherst, Massachusetts, July 21, 1821; studied law in Chicago and began practice in 1845. In 1852 he was elected to the Illinois legislature as an antislavery Republican, and in the following year became state senator. He practiced many years as a railroad lawyer, and became president of the Chicago and Milwaukee railroad. In 1870 he was appointed United States district judge for the northern district of Illinois; in 1892 he was temporarily relieved and appointed counsel for the United States before the Bering Sea Commission. See BERING SEA QUESTION, in these Supplements.

BLODGETT, LORIN, an American scientist; born near Jamestown, New York state, May 25, 1823; educated at Jamestown Academy and Hobart College; appointed in 1851 assistant professor at the Smithsonian Institution at the national capital. In 1853 his papers on atmospheric physics, presented before the American Association for the Advancement of Science, were the first on this subject published in America, and entitled Mr. Blodgett to be called the father of the science of climatology in America. In 1857 he published *The Climatology of the United States and of the Temperate Latitudes of the North American Continent.* From 1859 to 1864 he edited the *North American*, and was secretary of the Philadelphia Board of Trade. He contributed many articles on finance to the *North American Review* and other publications. In 1863 he became statistician of the United States Treasury Department and his *Commercial and Financial Resources of the United States* (1864) has been widely quoted, not only in the United States, but in Europe.

BLOEMFONTEIN, the capital of Orange Free State, South Africa, situated on the Modder, 200 miles N.W. of Durban. It is connected by telegraph with the Cape and Natal. Population 1890, 3,500.

BLOMMAERT, PHILIP, a prominent Flemish

author; born in Ghent about 1809; died there, Aug. 14, 1871. In 1834 he published a volume of verse, characterized by much simplicity and earnestness, but so inartistic in form that it met with little success. He rendered better service to literature and to the patriotic cause by the publication (1836–41) of several old Flemish poems of the twelfth, thirteenth and fourteenth centuries. His most important work is a *History of the Belgians* (1849), in which he attempts to show that the political destiny of the Low Countries has ever been identical with that of Germany, and that it is with the latter country, and not with France, that Belgium should seek to ally herself.

BLONDEL, a celebrated French minstrel of the twelfth century, and the favorite of Richard the Lion-Hearted, king of England. He was born in Hesle, Picardy, France; according to tradition (probably a folk-lore fable) he discovered the place of Richard's imprisonment by singing under the tower of the castle of Dürrenstein, a song composed by the king and himself. A few of Blondel's poems are preserved in the library of the arsenal of Paris.

BLONDIN, CHARLES (ÉMILE GRAVELE), a famous tight-rope walker, born at St. Omer, France, Feb. 28, 1824. He crossed the Niagara River below the falls on a rope 1,300 feet long, which was stretched 150 feet above the water, in 1855, 1859 and 1860, and performed other similar feats of daring at various places. Died Feb. 22, 1897.

BLOOD, AVENGER OF. In the early ages of society it was almost universally looked upon as the duty of the next of kin to avenge the death of a murdered relative; but among some primitive peoples, for example, the modern Bedouins, as among the ancient Anglo-Saxons, the right is annulled by compensation. The Mosaic law did not set aside this universal institution of primitive society, but placed it under regulations, prohibiting the commutation of the penalty of death for money, and appointing cities of refuge for the involuntary manslayer. The nearest relative, whose duty it was to hunt down the murderer, was called *Goël*, the "redeemer" or "avenger."

BLOOD, COMMERCIAL USES OF. See ABATTOIRS, in these Supplements.

BLOOD-BIRD OR SOLDIER-BIRD (*Myzomela sanguinolenta*), a beautiful little honey-sucker. The head, breast and back of the male are of a beautiful scarlet color. It inhabits the thickets of New South Wales. See HONEY-EATER, Vol. XII, p. 139.

BLOOD-FLOWER (*Hæmanthus*), a genus of bulbous-rooted plants of the family *Amaryllidaceæ*, mostly natives of South America. The beautiful red flowers form a fine cluster. The fruit is a berry, usually with three seeds; the leaves are almost linear in some, and round or erect in others. The species of blood-flower generally possess poisonous properties. The inspissated juice is used by the natives of South America for poisoning their arrows. The name is also applied in the West Indies to *Asclepias Curassavica*, a species of milkweed with crimson flowers, and common in the tropics.

BLOODHOUND, a naturally fierce breed of dog, with remarkable tracking instincts. (See DOG, Vol. VII, p. 328.) In the earlier days of the West Indies and the United States bloodhounds were frequently used to track runaway negroes. With emancipation the use of bloodhounds has now been confined to the tracing of criminals in sparsely settled districts, or of escaped convicts.

BLOOD-MONEY, a reward for bringing about the arrest or conviction of another in a criminal charge. The name is also applied to the compensation formerly, and still in some countries, paid to the next of kin for the slaughter of a relative.

BLOOD-POISONING. See SEPTICÆMIA, Vol. XXI, p. 666.

BLOODROOT, a name applied to two very different plants. In Europe and Northern Asia it is the *Potentilla*, *tormentilla*, or "tormentil," of the family *Rosaceæ*. The root has a red coloring matter, and is rich in tannin. In the United States it is the *Sanguinaria canadensis*, of the family *Papaveraceæ*, or "poppies." It is one of the earliest and most beautiful of spring flowers, whose large root-stocks yield an orange-red juice containing the peculiar alkaloid *sanguinarin*, used in medicine as a stimulant, expectorant and emetic.

BLOODSTAINS, DETECTION OF, an important subject in connection with forensic medicine. On criminal trials the guilt of prisoners has frequently been established by the discovery of these stains. Blood, when liquid, stains all articles with which it comes in contact. It sinks into woven textures and such material as soft wool; on hard substances it forms a film of more or less thickness, and quickly dries. At first it is of a reddish brown color, but in the course of a few weeks this deepens and becomes almost black. Looked at with a lens of low power—say 10 or 20 diameters—the blood, if in any quantity, and coagulated, and if it has not sunk into the texture of the cloth, is observed to present an irregular surface, and entangled in it have frequently been detected foreign materials which have afforded a clew to the culprit and to the manner in which the crime has been committed. This concluded, the attempt is next made to discover the peculiar corpuscles of the blood, which is frequently a matter of great difficulty. The object is, by breaking up the coagulum, to segregate the corpuscles in some medium of the same density as the *liquor sanguinis* of the circulation. The one generally employed is a solution of glycerin in water, and where this is applied to a bloodstain, or particles of the coagulum dropped into it, the corpuscles are so separated as to be easily discernible by a high-power microscope. Human blood in these circumstances, however, cannot be positively distinguished from that of other mammalia.

Of late years the interesting fact has been discovered that blood possesses a distinct spectrum,

so that it is possible to determine that a reddish fluid is really blood, although the corpuscles may not have been discovered, owing to their accidental destruction. The chemical tests of blood are very definite. All stains due to blood are soluble, and this fact enables us at once to distinguish them from insoluble stains which closely resemble them, and which have frequently been mistaken for them, such as paint and iron-mold. Thus there are three positive methods by which actual blood-stains may be robbed of their secret; and lately in several interesting medico-legal cases, where it was suspected that articles of clothing had been washed in order to obliterate the traces of blood, its presence has been determined by its reaction with the resin of guaiacum.

BLOOM, in botany, refers to the waxy coating found on the surface of certain leaves, stems, fruits, etc. The minute structure is various, but it has the general property of being readily brushed off. Common examples are found on the fruits of grapes and plums, young stems of certain raspberries, leaves of cabbage. The waxy or resinous character of "bloom" indicates that it is not merely excreted as a waste product, but may serve as a protection against the wetting of the surface, or against extremes of temperature.

BLOOMER, AMELIA (JENKS), born in Homer, New York, May 27, 1818. She advocated temperance and woman's suffrage, and in 1856 commenced to wear a dress for women, consisting of a short skirt and full trousers, which was mercilessly ridiculed as the "Bloomer costume," and of which she was not the inventor. She died in Council Bluffs, Iowa, Dec. 29, 1894, having lived long enough to see bloomers adopted in that year by some few women bicycle-riders.

BLOOMERY OR BLOOMARY, an early charcoal process of converting cast into wrought iron. See IRON, Vol. XIII, p. 319.

BLOOMFIELD, a city of southwestern Indiana, the capital of Greene County; situated on the Louisville. New Albany and Chicago railroad, 80 miles S.W. of Indianapolis. It is in the midst of an agricultural region and in close proximity to extensive coal and iron deposits. Population 1890, 1,229.

BLOOMFIELD, a city of Iowa, county seat of Davis County, situated on an elevated prairie about 85 miles W. of Burlington. It is the trade center of a fertile agricultural district, enjoys excellent educational facilities, and contains important manufactories of furniture, plows and wagons. Population 1890, 1,913.

BLOOMFIELD, a manufacturing town of Essex County, New Jersey; situated on the Morris canal, and on the Lackawanna and Greenwood Lake railroads, about 5 miles N.W. of Newark. It contains a cabinet-organ factory, an iron foundry and manufactories of paper and woolen goods. Population 1890, 7,860.

BLOOMFIELD, MAURICE, an American philologist; born in Austrian Silesia, Feb. 23, 1855; came to America at the age of 12; studied at Furman College, South Carolina, at Yale, and at Johns Hopkins; also in Berlin and Leipsic; became professor at Johns Hopkins University in 1881, later was appointed to the chair of Sanskrit and comparative philology there. He has edited several Sanskrit texts, and has contributed much to periodical and scientific literature.

BLOOMINGTON, a city of Illinois, capital of McLean County, situated nearly in the geographical center of the state, and surrounded by a rich agricultural region. Four trunk lines of railway furnish an outlet in every direction. The city is located on the highest land in the state, and its systems of sewerage, gas and water mains are extensive. The streets are wide, lined with trees, and lighted with gas and electricity. Electric street-cars radiate from a central point to all parts of the city. The water-supply is from subterranean sources, which furnish daily 2,500,000 gallons. The water is strongly impregnated with iron, and claims are made for its healthfulness.

Bloomington carries on a large wholesale trade, and its manufacturing industries are numerous. The Chicago and Alton railroad shops are located here, and employ over 2,000 men. The city is handsomely laid out, and has two well-kept parks. The means of education are ample, there being numerous public and private schools, and a large public library. The Illinois Wesleyan University was founded here in 1857. The Major Female College and the Roman Catholic Academy are also located in the city, while at Normal, two miles distant, is the State Normal University, organized in 1857, with an edifice costing $200,000. The State Soldiers' Home is also located at Normal. The population of Bloomington was, in 1880, 17,180; in 1890, 20,484.

BLOOMINGTON, a city of Indiana, county seat of Monroe County, situated about 55 miles S.W. of Indianapolis. It is the seat of the Indiana State University, and contains extensive manufactories of woolen goods, staves and leather. There are also important manufactories of hardwood, and in the vicinity are extensive quarries of limestone. Population 1890, 4,018.

BLOOMSBURG, a flourishing railroad town of Pennsylvania, 56 miles S.W. of Scranton, situated on Fishing Creek. It contains ten churches, three banks, iron furnaces and foundries; it is the seat of a state normal school, and the county seat of Columbia County. Population 1890, 4,635.

BLOUET, PAUL, "MAX O'RELL," was born in Brittany, France, on March 2, 1848; educated in Paris, and took his degree in 1864 and 1865. He received his commission in the French army in 1869; fought in the Franco-Prussian War; was made a prisoner at Sedan on Sept. 3, 1870; fought against the Commune; was wounded severely and pensioned. He is the author of *John Bull and his Island* (1883);



"MAX O'RELL."

*John Bull's Daughters* (1884); *Jonathan and his Continent* (1889); and *John Bull & Co.* (1894). He has also written educational works, among which is *French Oratory* (1883). Several orders, French and others, have been conferred on "Max O'Rell."

BLOW-FLY, a name popularly applied to flies of several species of *Musca*, which deposit their eggs, or "fly-blows," on meat and decaying organic matter. The bluebottle fly is an example.

BLOWING-MACHINES OR BLOWERS. See BELLOWS, Vol. III, pp. 549–553.

BLOWITZ, HENRI GEORGES STEPHANE ADOLPHE OPPER DE, a noted French journalist; born at the castle of Blowitz, in Bohemia, Dec. 28, 1825, of a Jewish family; he became a French citizen and added De Blowitz to his parents' name, Opper. He first taught school and then commenced writing for the press; after the Franco-Prussian war he assisted in breaking up the Commune, and for this received the decoration of the Legion of Honor. It was at this period that he laid the foundations for his journalistic career by becoming the Paris correspondent for the London *Times*. His position has been so assured that politicians of every degree have consulted him and have used his pen to promulgate their views or intentions to the world. In 1878 M. de Blowitz was promoted to be an officer of the Legion of Honor. He has written several minor and miscellaneous works.

BLOWPIPE AND ARROW, a kind of weapon much used by the Indians of South America, both in war and for killing game. It consists of a long, straight tube, in which a small poisoned arrow is placed, and forcibly expelled by the breath. The tube or blowpipe is 8 to 12 feet long, made of reed, or the stem of a small palm. In the hand of a practiced Indian it is a deadly weapon, even when directed against birds in the tops of high trees. As the weapon makes no noise, the hunter often empties his quiver before he gathers his game. Many savage nations, especially the inhabitants of the Andaman Islands, have similar weapons.

BLUEBEARD, the name given to the villain of a well-known tale of fiction, said to be of French origin. According to this romance the Chevalier Raoul has a blue beard, from which he gets his designation. See also RAIS, Vol. XX, p. 258.

BLUEBELL, the popular name of several different plants. In England the name is given to the common wild hyacinth, *Scilla nutans*. The Scottish bluebells are flowers of *Campanula rotundifolia*, commonly called harebell elsewhere. Also applied to *Muscari botryoides*, the "grape-hyacinth." The term is also occasionally applied to other plants having blue bell-shaped flowers.

BLUEBERRY, a name applied in New England to berries of certain species of *Vaccinium*, to distinguish them from those of the genus *Gaylussacia*, which are there called "huckleberries." However, the names are often used indiscriminately, and the name *huckleberry* is coming into general use for the berries of both genera. See HUCKLEBERRY and BILBERRY, in these Supplements.

BLUEBIRD, a name applied to a number of beautiful birds of the genus *Sialia*. They are well-known summer visitors in the United States. Their nests are usually built near human dwellings. They are noted for their very sweet and melodious song.

BLUE-BOOKS, the name popularly applied to the reports and other papers printed by order of the British Parliament, because they are usually stitched up in blue covers. The practice of printing, and to some extent publishing, the proceedings of the House of Commons began in the year 1681, when disputes ran high on the question of excluding the Duke of York from the succession to the throne. It was stated that false accounts of the transactions were circulated, and it was decided as a remedy that the proceedings of the House be printed. The documents printed by the House of Commons accumulated gradually in bulk and variety, until now the blue-books of a session, when collected and bound up, fill many thick folio volumes. The corresponding official books are yellow in France, white in Germany and Portugal, green in Italy and red in Spain. In the United States the term is applied to a book containing the names and salaries of all the persons in the employ of the government.

BLUEBOTTLE FLY. The name is applied to at least two species of *Musca*, but more properly to *M. Cæsar*. They deposit their eggs (fly-blows) upon meat and decaying animal substances. The name refers to the blue abdomen.

BLUECOAT SCHOOL, the name usually given to Christ's Hospital—a school in London founded by Edward VI—where the boys wear the ancient costume, of which a blue coat or gown forms a part.

BLUE-EYE (*Entomyza cyanotis*), a beautiful little bird of New South Wales, belonging to the family of honey-eaters (*Meliphagidæ*). Their food consists of insects and honey. They have a peculiar brush-like tongue, especially adapted to gathering honey from the flowers of the eucalypti, of which they are very fond.

BLUEFISH (*Pomatomus saltatrix*), a large ravenous fish allied to the mackerels. The specific name refers to the habit of leaping out of the water. It is found in many seas, and is common along the Atlantic coast in summer. A valuable food-fish.

BLUE-GOWNS, a name commonly given to a privileged class of mendicants in Scotland, whose proper designation was the king's beadsmen—the persons employed to pray for the king having gradually degenerated into a class of authorized paupers. Each beadsman on the king's birthday received a gown of blue cloth, with a loaf of bread, a bottle of ale, and a leathern purse containing a penny for every year of the king's life. The most important part of the privilege was a pewter badge, attached to the breast of the gown, with the bearer's name and an inscription, *Pass and Repass*. This inferred the privilege of beg-

ging, and bespoke the kindly consideration of all to whom the beadsman appealed for alms or a night's lodging. The practice of appointing beadsmen was discontinued in 1833; at that time there were 60 on the roll.

BLUE GRASS, the name of several species of *Poa*, a permanent grass found in Europe and North America. The blue grass of Kentucky (*P. pratensis*) is highly valued for pasturage and hay. It is also called June grass. The blue grass of England is *P. compressa*.

BLUE-GUM. See EUCALYPTUS, Vol. VIII, pp. 649, 650.

BLUE JAY (*Cyanocitta cristata*), a common North American bird of the crow family. It is about 12 inches long, with a fine crest; the color is purplish blue above, black on the neck and purplish gray below, the tail and wings blue, spotted with black and white. It is a mischievous bird, but devours large numbers of injurious caterpillars. The common blue jay has a wide distribution, and there are several other North American species. The long-tailed blue jays belong to a rarer genus (*Xanthura*), found in Central and in South America. See JAY, Vol. XIII, p. 611.

BLUE LAWS, laws of severe strictness once commonly believed to have been made by the colonial legislature of New Haven. They were supposed to have prescribed unwarrantable rules for the dress, the private life and the religious conduct of the colonists. It is certain, however, that no legal code of this description ever existed. The term itself, which is of uncertain origin, probably represented, in the minds of the people of various parts of colonial New England, the undue interference of the judges in the private affairs of citizens. It is now generally conceded that Samuel Peters, D.D., in his *General History of Connecticut*, published in England in 1781, originated the story of the so-called blue laws of the New Haven colony.

The fictitious blue laws of Peters insist that "no one shall run upon the Sabbath, or walk in a garden or elsewhere, except to and from meetings; no mother shall kiss her child on the Sabbath or on fast days; no one shall read the Book of Common Prayer, keep Christmas or Saints' Days, make mince pies, dance, play cards, or play on any instrument of music, except the drum, trumpet and jew's harp."

See Trumbull's "True Blue Laws of Connecticut and New Haven and the False Laws invented by Samuel Peters," published in Hartford, Conn., in 1876.

BLUE LICK SPRINGS, a village and watering place in Kentucky, situated on Licking River, about 50 miles N.E. of Lexington. It is noted for the medicinal virtues of its saline mineral springs.

BLUE MONDAY, a popular term for St. Crispin's Day, when it used to be customary to deck the churches of Europe with blue hangings.

BLUE MOUNTAINS, the name of a branch of the dividing range, New South Wales, which runs very nearly parallel with the coast, about 80 miles inland. It was not till 1813 that a practicable passage was found over them into the Bathurst plains. The highest point of the Blue Mountains, Mount Beemarang, is 4,100 feet high and parts of the road which crosses them are 3,400 feet above the sea. The name is also given to a range of mountains in the eastern part of the island of Jamaica; to a range in northeastern Oregon and a chain of the Alleghanies in Pennsylvania, east of Harrisburg.

BLUE RAPIDS, a city of Kansas, situated on the Big Blue River, at the mouth of the Little Blue, about 100 miles W. of Atchison. A developed water-power of nearly 2,000 horse-power drives extensive manufactories of flour, woolen goods, oil and paper; and in the vicinity are valuable beds of water-lime and gypsum.

BLUE RIBBON, a term applied to any great prize, such as the great Derby horse-race, from the blue ribbon worn by knights of the Order of St. Esprit in France, and of the Order of the Garter in England. Blue Ribbon army was the name adopted, from the badge, by the association of total abstainers known as the Gospel Temperance Union.

BLUE RIDGE, the most easterly range of the Appalachian Mountains in the United States. It forms a continuation of the chain called South Mountain in Pennsylvania and Maryland. It is known as the Blue Ridge till it crosses the James River; thence to North Carolina as the Alleghany Mountains; and in North Carolina again as the Blue Ridge. The southern portion of the Blue Ridge Range was the theater of some of the most severe battles of the Civil War.

BLUE STOCKING, a name given to learned and literary ladies. The name is derived from a literary society formed in London about 1780, which included both men and women. Two ladies named Montagu and Stillingfleet are supposed to have given the name to the society. The name has also been adopted in Germany and France.

BLUE SULPHUR SPRINGS, village and health-resort of West Virginia, situated in Greenbrier County, 22 miles W. of White Sulphur Springs. It is celebrated for the curative properties of its saline chalybeate waters.

BLUETHROAT (*Sylvia suecica*), a handsome bird, somewhat larger than the robin. See REDSTART, Vol. XX, p. 318.

BLUE VITRIOL, sulphate of copper. See COPPER, Vol. VI, p. 351.

BLUEWING OR TEAL DUCK (*Anas discors*), a favorite game-bird, common in North America. It spends the winter in the marshes of the Southern states, and in spring migrates to the far north. The wing-coverts are blue; hence the name.

BLUFFTON, a village of Indiana, county seat of Wells County, situated on the south bank of the Wabash, about 25 miles S. of Fort Wayne. It contains important manufactories of flour, woolen goods, barrels, barrel staves and heads, lumber, corn-planters and other machines, and a number of planing-mills and foundries. Bluffton enjoys excellent educational facilities, and is

extensively engaged in trade in lumber, stock and grain. Population 1890, 3,589.

BLUFFTON, a village of Allen County, Ohio, the junction point of several railroad lines; situated in the midst of a magnesium limestone formation It has several industries and is also an agricultural center. The region was settled almost exclusively by Germans. Population 1890. 1,290.

BLUHME, FRIEDRICH, a German jurist; born in Hamburg, June 29, 1797; studied law at Halle, Göttingen and Jena; was professor of jurisprudence at Halle, Göttingen and Bonn. He was versed in Roman law, and in his *Iter Italicum* (4 vols., 1824) and *Sketch of the Law of the Pandects* (1829), published the result of his researches in Italy. His Encyclopædia and System of German Law was published in 1858. He died at Bonn, Nov. 5, 1874.

BLUM, ROBERT, a German journalist and political agitator; born at Cologne in 1807; shot at Vienna, Nov. 9, 1849, for assisting in the uprising of the people in October. He was a man of strong character, and his execution caused much indignation among the democrats in Germany. He was the founder of the Schiller-Verein and of the German Catholic Church at Leipsic.

BLUM, ROBERT FREDERICK, an American artist whose forte was figure-painting; born in Cincinnati, Ohio, July, 1857; studied in New York and upon the continent of Europe. As a water-colorist, pastel-painter and illustrator he was well and widely known. His *Venetian Bead-Stringers* won him the $2,500 prize at the American Art Association in New York in 1889.

BLUMENTHAL, JACOB, a German pianist; born in Hamburg, Germany, Oct. 4, 1829; studied under Herz, and in 1849 moved to London. There he received the appointment of pianist to the Queen, taught music, and composed many brilliant, pretty pieces, with songs, of which *My Queen* is the most popular.

BLUMENTHAL, LEONHART, COUNT VON, field-marshal, chief of the general staff of the Prussian army, was born July 30, 1810, at Schwedt, on the Oder. Educated from 1820 to 1827 in the military academies of Culm and Berlin, he was entered on July 27, 1827, as second lieutenant in the Guard Landwehr Regiment. In the siege and battle of Fredericia he took so active and conspicuous a part that he was, on May 14, 1849, promoted as chief of the general staff of the Schleswig-Holstein army. On July 1, 1860, he became colonel and commander of the Thirty-first, later of the Seventy-first infantry regiment. Dec. 15, 1863, he was nominated the chief of the general staff of the combined mobile army corps against Denmark, and then had the first opportunity of exhibiting his splendid qualities. On June 25, 1864, he was promoted to be major-general, and received the order of Merit. When, on the outbreak of the war with France, the Crown Prince was intrusted with the command of the Third Army Corps, General von Blumenthal was tendered the post of chief of the general staff; and his Imperial Highness, when presented by the Emperor of Germany with the Iron Cross, declared that the same distinction was equally due to General von Blumenthal, who was made field-marshal in 1888.

BLUNT, ARTHUR CECIL, an English actor, was born in London in 1842, and belonged to a family of some opulence and social distinction. He was diverted from an army career by his successes in amateur theatricals; at 27 joined Mrs. German Reed's company at the Gallery of Illustration, appearing in *No Cards*, and a musical version of *Box and Cox*. Here he attained distinction by his "make-up," and he always remained a social favorite. He played in comedy in the principal theaters of London. In 1883 he joined in the management of the old Court Theatre in Sloane Square, and four years later transferred his interests to the New Court Theatre and the management of Mrs. John Wood. His best rôles were in *Miss Gwilt*, *Peril*, *The Vicarage*, *Mama*, *Diplomacy*, *The Magistrate*, and *The Cabinet Minister*. His stage name was Arthur Cecil; died in Brighton, April 16, 1896.

BLUNT, JOHN HENRY, an English clergyman and writer on ecclesiastical subjects; born in Chelsea, London, Aug. 25, 1823; educated at the University of Durham. After filling various ecclesiastical offices he became rector of Beverton, Gloucestershire, in 1873. His works are chiefly in support of ritual and High Anglican churchmanship, and are scholarly. Among the best known are *A Dictionary of Doctrinal and Historical Theology* (1870) and *A Dictionary of Sects, Heresies, Ecclesiastic Parties, etc.* (1874). He died in London, April 11, 1884.

BLUNT, WILFRID SCAWEN, English traveler and poet, was born in 1840. He was educated at Stonyhurst and St. Mary's, Oscott. He served for some years as attaché to various British embassies in Europe; married in 1869 Anne, daughter of the Earl of Lovelace, and granddaughter of Lord Byron, and thereafter traveled through Spain, Algeria, Egypt and the Syrian desert, as recorded in Lady Anne Blunt's *Bedouins of the Euphrates*. In 1882 he championed the cause of Arabi Pasha in Egypt. He afterward plunged into the National cause in Ireland, and was imprisoned for two months in 1887–88 for taking part in a prohibited meeting. During his imprisonment he unsuccessfully contested Deptford. Blunt is the author of two volumes of verse, *Sonnets and Songs*, and the *Love Sonnets of Proteus*, the last containing poetry of merit.

BLUNTSCHLI, JOHANN KASPAR, a Swiss jurist and historian; born in Zurich, Switzerland, March 7, 1808; educated in Zurich and at Berlin; professor of law at Zurich in 1832 and at Heidelberg in 1859. He was prominent and conservative in politics; wrote *The History of Zurich* (1838); *The History of the Forest Cantons of Uri, Schwyz and Unterwald* (1847); *Geschichte des Algemeinen Rechts* (1864); *Die Lehre vom Staat*, etc. He died at Carlsruhe, Oct. 21, 1881.

B'NAI B'RITH, INDEPENDENT ORDER OF. See BENEFIT SOCIETIES, in these Supplements.

BOABDIL (properly Abu-Abdallah, and nicknamed El-Zogoibi, "the unlucky"), the last Moorish king of Granada, dethroned his father, Abu-l-Hasan, in 1481, and two years later was defeated and taken prisoner by the Castilians near Lucena. He was set free on condition of paying tribute, and returned to Granada to struggle with his father and uncle, El-Zaghal, for the throne. Thus the Moors wasted the strength they sorely needed for the final struggle with the Christians. The fall of Malaga and Baza was but the prelude to the siege of the capital itself, which was finally starved out toward the close of 1481, in spite of the reckless courage of the Moors and of Boabdil, whose weak and vacillating nature fell from him in the hour of battle. On Jan. 2, 1492, the unhappy king gave up to Ferdinand the keys of "that paradise," as Castelar terms Granada and its Alhambra "whence Moorish genius and Mohammedan culture had shot forth their last rays of dying splendor," then turned his back on Granada, and rode on toward the mountains. At Padul, on a spur of the Alpujarras, he turned to take a last look at the towers of the Alhambra and the Eden-fields of Granada which he had lost. "Allah Akbar" (God is great), he exclaimed, as he burst into tears. His mother, Ayesha, stood beside him. "You may well weep like a woman," she said, "for what you could not defend like a man." The spot from which Boabdil looked his last on Granada still bears the name of *El Ultimo Sospiro del Moro* ("the last sigh of the Moor"). El Rey Chico (the little king), as he was called, then crossed to Africa and flung away his life in battle.

BOA–CONSTRICTOR. See PYTHON, Vol. XX, p. 144.

BOARDMAN, GEORGE DANA. An American Baptist minister; born in Burmah, India, Aug. 18, 1828; was a graduate of Newton Theological Institute, Massachusetts; became a Baptist clergyman in Rochester, New York, and in Philadelphia; was prominent in the abolition movement and wrote many reviews and essays.

BOARDMAN, HENRY AUGUSTUS, an American Presbyterian divine and writer; born at Troy, New York, Jan. 9, 1808; died in Philadelphia, June 15, 1880. He was ordained to the Presbyterian ministry, Nov. 8, 1833; held a pastorate for 45 years, and was leader of the old school branch. He published 14 volumes on religious subjects.

BOARDMAN, RICHARD, one of the pioneer missionaries sent by George Wesley "the dark American to convert"; born in England in 1738; allied himself with Wesley in 1763; sailed as a volunteer missionary to the colonies in 1769; preached through New England until 1774, when he returned to England; continued in the ministry until his death at Cork, Ireland, Oct. 4, 1782. He is considered one of the fathers of American Methodism.

BOARD OF ADMIRALTY, a department of the English governmental system, charged with the supervision of naval affairs. See ADMIRAL, Vol. I, p. 158.

BOAR–FISH, a name applied to fishes of no less than three widely different genera, on account of their projecting snout. The term is commonly applied to members of the genus *Capros*, which are common in the Mediterranean. Two South Sea fishes have received the same name.

BOAS, FRANZ, an American ethnologist; born in Minden, Westphalia, Germany, July 9, 1858; educated at Heidelberg, Bonn and Kiel; explored the Arctic region extensively and made many studies of Indian tribes; assistant editor of *Science*, 1886–88; professor of anthropology at Clark University, Worcester, Massachusetts, 1889–92; assistant chief of the department of anthropology at the World's Columbian Exposition, 1893. His books and contributions on ethnology are numerous and valuable.

BOATBILL. See HERON, Vol. XI, p. 762.

BOAT–FLY, an aquatic insect of the order *Hemiptera*. The body has the form of a boat; hence the name, common in this country, of boat-insect or water-boatman. They always swim on their backs, and are sometimes called back-swimmers.

BOATSWAIN, a warrant-officer in the navy, and an inferior executive officer in the merchant service. See NAVY, Vol. XVII, p. 293.

BOATSWAIN–BIRD, THE, a name recently applied by sailors to the TROPIC-BIRD, of the family *Phaëthontidae*. (See Vol. XXIII, p. 588.) Sailors have at times bestowed this name on other birds, especially the SKUA; q.v., Vol. XXII, p. 125.

BOBOLINK, a well-known American passerine bird of the family *Icteridæ*. They pass the winter in the southern United States and the West Indies. In the spring they migrate northward, and breed in the Northern states. The male, in the breeding-season, is black, with white on the back and wings. After moulting in August, both sexes are called rice-birds, or reed-birds, and after fattening on seeds are eagerly hunted as food-delicacies. The bobolink is a valuable insect-destroyer.

BOB–WHITE, a species of quail. See QUAIL, Vol, XX, p. 147.

BOCAGE, MANOEL MARIA BARBOSA DO, a Portuguese poet; born in Setubal, Sept. 15, 1765; a soldier in his youth, and later one of the Nova Arcadia school of Portuguese poets, under the pen-name of "Elmano Sadino." His poesy was as advanced as his political opinions; in 1797, after escaping imprisonment for participation in the Revolution, he was incarcerated for atheistical and seditious writings. He died Dec. 21, 1805.

BOCA TIGRIS, the debouchure of the Canton River into the Outer Waters, or Lintin Bay, China. On the surrounding promontories are the remains of the Bogue Forts, bombarded, stormed and dismantled by the English in 1841 and 1847.

BOCKENHEIM, a town in Hesse-Nassau, Prussia, 3 miles N.W. and adjoining Frankfort-on-the-Main; has manufactures of ironware, pianos and fancy articles and an extensive cattle market. Population 1890, 18,675.

BODE, JOHANN EHLERT, a famous German astronomer; born at Hamburg, Germany, Jan. 19,

1747; astronomer at the Berlin Academy for over half a century, and from the age of 25 years. He is best known as the author of Bode's Law (See ASTRONOMY, Vol. II, p. 806), which, before the discovery of Neptune, was supposed to govern the distances of the planets from the sun. But the substance of this law had been discovered by a German astronomer named Titius and published in 1766.

BODENSTEDT, FRIEDRICH MARTIN VON, a German translator and poet; born in Peine, Hanover, April 22, 1819. In 1840 he went to Moscow as tutor to the children of Prince Galitzin, and there translated the poems of Pushkin and other Russian authors. After extensive travels in the Crimea, Turkey, Greece and Asia Minor, he returned to Germany in 1847, and published *Die Völker des Kaukasus* (1848). He edited for some years the *Weser Zeitung*, and in 1854 was appointed professor of Slav languages at Munich, afterward obtaining also the chair of Old English there. These posts he resigned in 1866 for the superintendence of the Meiningen Court Theater, which he retained only till 1873. Bodenstedt published many translations from the Russian, English and Persian, and won a high reputation as a poet. His most popular work is the *Lieder des Mirza Schaffy*. He died in Wiesbaden, April 19, 1892.

BODIE, a mining town in Mono County, California, situated on a spur of the Sierra Nevada Mountains, 100 miles S. of Carson City. It has two mills for treating gold ore, and is the location of the noted Standard and Bodie mines. Population 1890, 1,000.

BODLEIAN LIBRARY. See OXFORD, Vol. XVIII, p. 95.

BODMER, JOHANN JAKOB, a Swiss literary critic and poet; born near Zurich, July 19, 1688; founded a literary journal on the lines of the English *Spectator* in 1721; an admirer of Milton's lofty style to the verge of enthusiasm, he revolutionized German literary criticism and greatly influenced the later German poets, such as Wieland and Klopstock. He did much to advance the study of the distinctively German *Minnesong;* Goethe early visited this father of German literary critjcism, who was, for half a century, professor of history at Zurich. He translated *Paradise Lost* into German; wrote numerous, if not strikingly original, works, and died at Zurich, Jan. 2, 1783.

BODMER, KARL, a Swiss artist; born in Zurich in 1805. He resided in Paris and Germany, painting chiefly landscapes and animal life. He spent two years in America (1833–35) in the company of Prince Maximilian of Wied, and made sketches of Indians and forest scenes, which have since become exceedingly valuable; no artist of equal skill having, up to that period, visited the country west of the Mississippi. His etchings are numerous, delicately executed, and have received the praise of many artcritics.

BODTCHER, LUDVIG ADOLF, a Danish lyric poet. See DENMARK, Vol. VII, p. 92.

BODY CAVITY OR CŒLOME, a term used in anatomy to designate the space between the body-wall and the outer surfaces of the visceral organs. It is lined with a delicate membrane, the peritoneum, folds of which support the viscera. The pericardium is a portion of the cœlome, which has been inclosed. In mammals, a muscular diaphragm divides the body cavity into a thoracic cavity, containing heart and lungs, and an abdominal cavity with the remaining viscera.

BODY-COLOR, a term applied to such pigments as have body enough to be opaque, as distinguished from those which are transparent. As a general rule, pigments have more body the nearer they approach to white; consequently the light parts of pictures in oil are in body-color to give them brightness and strength, while the dark parts are transparent to give them depth. In water-color painting, works are said to be executed in body-colors when, instead of proceeding by transparent tints and washes, the pigments are mixed with white and thus rendered opaque.

BODY'S ISLAND, an island belonging to Dare County, off the coast of North Carolina, situated between Albemarle and Roanoke sounds. There is a government lighthouse here of the first order, with a tower 156 feet above the water-line.

BOEHLER, PETER, a Moravian bishop, born at Frankfort-on-the-Main in 1712; died in London in 1775. He was the founder of Nazareth, a Moravian village of Pennsylvania. He is also well known in Methodist history for the decisive impulse given by him to the career of John Wesley.

BOEHM, SIR JOSEPH EDGAR, a noted English sculptor; born in Vienna, Austria, July 4, 1834, the son of the director of the Austrian mint. His art education was obtained in Vienna, Paris and in Italy. Settling in England in 1862, his finished and artistic execution of the colossal statue of the *Prince Consort* won for him the continued patronage of Queen Victoria, who, in 1881, appointed him sculptor-in-ordinary, and in 1889 created him a baronet. Many and characteristic were his statues. One of the finest, a colossal *John Bunyan*, stands in bold relief before a bank of chestnut trees in the town of Bedford, in whose jail Bunyan wrote his incomparable prose. Statues of *Lord Napier of Magdala*, *Lord Lawrence*, *Thomas Carlyle*, *Lord Beaconsfield* and *Dean Stanley*, in various English and colonial towns, form enduring memorials of Boehm's art. He died in London, England, Dec. 12, 1890.

BŒHM, THEOBALD (1802–81), a Bavarian musician, known as the inventor of important improvements in musical instruments, especially the flute. The Bœhm flute is recognized as the best model for orchestral use, being more easily fingered and more even and accurate in tone than the common flute.

BŒHMERIA, a genus of the family *Urticaceæ*, of which the most important species, *B. nivea*, a shrubby plant of China and the East Indies, affords the valuable rhea-fiber or grass-cloth fiber, also known by its Malay name of "ramie." It has been successfully cultivated in the United

States. The puyha-fiber of the Himalayas is derived from *B. Puya*, now referred to the genus *Maoutia*. A number of species yield a tough fiber used in making ropes, twine, etc. The genus is allied to the nettles, but does not possess their stinging properties. The North American species are known as "false-nettles."

BOEO, CAPE, the westernmost point of the Island of Sicily; lat. 37° 48′ 10″ N., long. 12° 25′ 10″ E.

BOERNE, a village and health-resort of southwest central Texas, county seat of Kendall County. It is pleasantly situated on the Rio Cibolo, about 30 miles N.W. of San Antonio, on the San Antonio and Aransas Pass railroad. The climate is genial, and the surrounding country is fertile and picturesque. Population 1890, 433.

BOERS, descendants of Dutch, French and German emigrants to the Cape of Good Hope. See TRANSVAAL, Vol. XXIII, pp. 518, 519; and see AFRIKANDER and SOUTH AFRICAN REPUBLIC, in these Supplements.

BOFARULL Y BROCA, ANTONIO, a Spanish philologist; the historian of old-time Catalan; born Dec. 4, 1821; was custodian and director of the archives of the ancient city of Barcelona; under the pen-name of "El Coblejador de Moncada" he wrote many poems in the Catalan dialect. His *Critical, Civil and Ecclesiastical History of Catalonia* (9 vols., 1876–78) and his *Critical History of Catalonia's War of Independence* (1886–87) are his best-known works.

BOGAN, a river in the interior of New South Wales. It rises in the western central portion of the colony, lat. 33° S., long. 148° 20′ E., and flows northwest, joining the Darhag River in about 30° N., 146° E. Its length is nearly 450 miles, and the entire area drained by its waters is about 8,300 square miles in extent. During the greater part of the year, especially in the long season of drouth, it is reduced to little more than a chain of lagoons, the waters of which are but partially navigable.

BOGARDUS, ANNETJE (JANSEN). See JANS ANNEKE, in these Supplements.

BOGARDUS, EBERHARDUS, the second minister of New York in Dutch colonial days (1633–47). See JANS ANNEKE, in these Supplements.

BOGARDUS, JAMES, an American inventor; born at Catskill, New York, March 14, 1800; died in New York City, April 13, 1874. He was apprenticed to a watchmaker, and early showed the bent of his mind by improvements in the construction of eight-day clocks, and by the invention of a delicate engraving-machine. The dry gas-meter is his invention, as is also the transfer-machine to produce bank-note plates from separate dies; and in 1839 his plan for manufacturing postage-stamps was accepted by the British government. He subsequently introduced improvements in the manufacture of India-rubber goods, tools and machinery, and invented a pyrometer, a deep-sea sounding-machine and a dynamometer. In 1847 he erected a factory in New York entirely of cast-iron, five stories high, which was the first of the kind ever built, and his success led him to engage in the erection of similar structures in other places.

BOG-BUTTER. See ADIPOCERE, Vol. I, p. 153.

BOGERMANN, JOHANN (1576–1633), the president of the famous Synod of Dort; born in the Frisian village of Oplewert. After studying at Heidelberg and Geneva, he became pastor at Leeuwarden, and soon distinguished himself by the active part he took in the religious controversies of his time, especially that against Arminius. In 1618 he was elected president of the Synod of Dort, but his name is now remembered for the translation of the Bible into the vernacular, mainly by him, which soon became the standard Dutch version. He died in 1633, at Franeker, where he was primarius professor of divinity.

BOGGS, CHARLES STUART, an American naval officer; born in New Brunswick, New Jersey, Jan. 28, 1811. He entered the navy in 1826, and had risen to the rank of commander in 1855; is distinguished as the commander of the *Varuna* at the capture of New Orleans; was promoted commodore in 1866; rear-admiral in 1870; retired in 1873. Died in his native town, April 22, 1888.

BOGHEAD COAL (TORBANITE OR BITUMENITE), a seam met with in the Carboniferous system in the lands of Torbanehill, Bathgate, Scotland, whose components are: Carbon, 80.39; hydrogen, 11.19; oxygen, 7.11; nitrogen and sulphur, 1.31. It is extremely bituminous, and takes one of its names from Boghead, in the county of Linlithgow, Scotland. On account of its composition, Boghead coal is of more value for the manufacture of paraffin, gas and for the illuminant substances found in it than for fuel. It is not properly a coal, but rather a bituminous clay or shale.

BOG-IRON ORE OR IRONSTONE, an ore formed in marshes or bogs by precipitation from ferrous carbonate. The latter is soluble in water. The oxygen of the air, acting upon the solution, forms ferrous oxide, carbon dioxid being set free. On dredging up deposits of bog-iron ore a new formation of lumps is often found after the lapse of some years. Large deposits are found in Finland, Norway, Sweden and at Three Rivers, Canada. See GEOLOGY, Vol. X, p. 232.

BOGOSLOV, a volcanic island at the western end of the Aleutian archipelago, in lat. 53° 58′ N., long. 168° W. Originally its site consisted of wave-washed reefs and low rocks. In 1795 the vast latent forces of the earth threw up a mountain 450 feet high, which has remained in almost constant eruption ever since. In 1883, in the midst of a gigantic outbreak, another peak called Grewinck was thrown up from the sea and connected with Bogoslov by a narrow strip of lava and ashes about a mile in length. The volcanic eruptions of Bogoslov form a natural lighthouse for vessels entering the Bering Sea.

BOGUE, DAVID, a Scotch independent preacher, noted as one of the founders of the London Missionary Society; born in the county of Berwick, Feb. 18, 1750; educated at Edinburgh, and became an Independent pastor at Gosport, in Hampshire. He wrote several theological works of minor value, and in conjunction with James Bennett com-

piled a *History of Dissenters from 1689 to 1808* (1808). In 1795 he was one of the founders of the London Missionary Society. He died in Brighton, Sussex, October 25, 1825.

BÖHLER, PETER, a Moravian bishop and theologian, famous as the man who did much to influence George Wesley; born in Frankfort-on-the-Main, Dec. 31, 1712. He went to America in 1738, and two years later founded the town of Nazareth, in Pennsylvania. He died in London, April 27, 1775. See METHODISM, Vol. XVI, pp. 185, 186.

BÖHTLINGK, OTTO, a noted Germano-Russian Orientalist; born at St. Petersburg, May 30, 1815; studied at the University of Bonn; returned to St. Petersburg in 1842, and three years later was made a member of the Imperial Academy. As early as the age of 25, he edited the Sanskrit grammar of Panini, followed by many other Oriental textbooks. In 1852 he commenced the magnificent folio Sanskrit-German dictionary of the Imperial Russian Academy, Its seventh and concluding volume was published in 1875. As a text critic Dr. Bohtlingk has the highest rank.

BOHUN UPAS. See UPAS TREE, in these Supplements.

BOIES, HORACE, an American public man; born in Erie County, New York, in 1827. In 1843 he emigrated to Wisconsin, but in 1852 returned to his New York home, and was admitted to the bar of that state. In 1867 he removed to Iowa and settled at Waterloo, in Blackhawk County. He acted with the Republican party during the period of the Civil War, and up to 1880; but in the last-named year became dissatisfied with the tariff plank of the state Republican platform, and in 1883 broke away from the Republican party, when the Iowa state convention pronounced for prohibition. In 1884 he canvassed the state of Iowa for Cleveland, and in 1889 was elected governor on the Democratic ticket, being the first Democratic governor of that state in thirty years. He was re-elected in 1891. At the Democratic National Convention held in Chicago in 1892 Governor Boies's name was proposed by his state delegation as a candidate for the Presidency.



HORACE BOIES.

BOIL, an inflamed sweiling of the epidermal tissues, which may appear upon any part of the human body, unless it be the soles of the feet or palms of the hands. It first appears as a small hard point, which is considerably inflamed and painful. The inflammation spreads, usually for several days, and the boil becomes more and more painful, until it reaches maturity, when it is conical in form and bears upon its apex a blister of light color. Soon this opens, and the *core*, consisting of dead cellular tissue, is discharged. The boil then, after slight further discharge, quickly heals and usually leaves a small scar. *Blind boils* subside without discharge, and are generally more painful than the commoner form. Boils result from an abnormal condition of the blood and poor nutrition of the body.. Persons experiencing any sudden change of diet or daily habit are peculiarly susceptible to them. They do not necessarily indicate an unhealthful condition. Collodion frequently applied to a boil in its first stages hinders its further development. Sulphid of calcium is useful for hastening the maturity of boils. It should be taken internally, and in doses no larger than a quarter of a grain. To lance a boil also hastens its course and gives much relief.

BOILERS, WATER-TUBE. During the past ten years tubular or water-tube boilers have been steadily growing in popularity. This is mainly owing to the fact that they enable the engineer to place more heating-surface and more grate-area into a given space, and therefore concentrate more power in one spot. Another reason is, that they are unquestionably safer and free from disastrous explosions. Most of the new forms are imitations of the Root and the Babcock and Wilcox boiler, and are composed of various forms of sectional headers made of cast-iron.

The Heine safety-boiler presents an entirely different type. In place of a number of cast headers, this boiler has two end chambers, or water-legs, built up of riveted steel plates, with hollow stay-bolts. Since cast metal is rigidly excluded from all parts subject to tensile stress, it is capable of sustaining the highest pressures with safety. A number of these boilers have been run for long periods at 500 pounds' pressure, but most of them are built for pressures from 150 to 200 pounds. Another feature in which the Heine boiler differs from the sectional types above mentioned is in its large throat-areas, which, being nearly equal to the aggregate tube-area, prevent any curtailment of the circulation of the water, which is the life of a water-tube boiler. Finally, the fuel gases are made to travel along the tubes instead of across them, making better utilization of the volatile parts of the fuel possible. Owing to their greater lightness and compactness, as well as cheapness in repairs, water-tube boilers are rapidly coming in use in naval vesssels and in the merchant marine. See STEAM-ENGINE, Vol. XXII, pp. 496–501.

BOILING–POINT. See EVAPORATION, Vol. VIII, p. 728.

BOIS D'ARC. See OSAGE ORANGE, in these Supplements.

BOIS DE BOULOGNE. See PARIS, Vol. XVIII, p. 275.

BOIS–DUVAL, JEAN ALPHONSE, physician and naturalist, was born at Ticheville, in the department of Orne, France, June 17, 1801. On the 30th of December, 1879, he died in the village of his birth. After obtaining a medical education at Rouen and in Paris, he built up a considerable practice and rendered noteworthy service during the epidemic of cholera in 1835. His researches in natural science were in the divisions of botany and entomology. His authorship of a *French Flora* and of *The Caterpillars of Europe* and *Natural History of Insects* gave him authority among the natural scientists of his day.

BOISÉ CITY, capital of Ada County and of the state of Idaho, is upon the Boisé River, and at the head of the Snake River Valley. It is an important mining center and the chief commercial city of the state. Boisé City is nearly 3,000 feet above sea-level and enjoys a delightful climate. It is one of the few cities of the world which is supplied with pure hot water from a natural source. A settlement was made here in 1863, and the city incorporated two years later. In the same year it was made the capital of Idaho, whose admission to the Union occurred in 1890. There are here flour and lumber manufactories, the state penitentiary and a United States assay-office. Population 1890, 2,311. The numerous mining-camps in the immediate vicinity, which furnish the bulk of the city's business, and are actually tributary to it, are not included within the municipal limits.

BOISGOBEY, FORTUNÉ ABRAHAM DU, novelist and army officer, was born at Granville, France, Sept. 11, 1821, of a family which, before the Revolution, was named D'Abraham-Dubois. As paymaster of the army of Africa, he took part in several campaigns between 1844 and 1848. Then, after devoting several years to travel, he turned his attention to authorship, and published, in 1868, *Two Comedians*, a novel. A crowd of stories from his pen followed in quick succession, which, sensational in their nature, sold easily and won for their author considerable repute. These were closely imitative of the style of Gaboriau, but fell short of the finished literary structure found in the writings of that novelist. Boisgobey's claim to excellence is best founded upon his *Man without Name; The Mysteries of New Paris; The Crime of the Opera;* and *The Secret of Bertha.* He died in Paris, Feb. 28, 1891.

BOISSIER, MARIE LOUIS GASTON, a French author and classical scholar, was born in Nîmes, Aug. 15, 1823. In 1861 he became professor of Latin oratory in the College of France, and was made an Academician, June 8, 1876. He has been a frequent contributor to periodical literature, and is the author of *A Study of Terentius Verro; Cicero and his Friends;* and *The Opposition under the Cæsars;* also a number of works upon Roman archæology. He became a commander of the Legion of Honor, Dec. 21, 1888.

BOISSY D'ANGLAS, FRANÇOIS ANTOINE, COMTE DE, French statesman, was born at St. Jean Chambre, in Ardèche, Dec. 8, 1756; died in Paris, Oct. 20, 1826. He was for some time major-domo to the Count of Provence (Louis XVIII), and a member of the States-General. During the Reign of Terror, fear of the "Mountain" kept him quiet; but, yielding to the solicitations of Tallien and Barère, he joined the conspiracy against Robespierre. Two months after the execution of this tyrant, he was elected secretary of the Convention, and shortly afterward a member of the Committee of Public Safety, in which capacity he displayed remarkable talent and discretion. Afterward he became president of the Council of Five Hundred; was made a count and a senator by Napoleon in 1805, and was made a peer by Louis XVIII. In addition to a number of essays upon political subjects, he wrote a *Life of Malherbe.*

BOJADOR, CAPE, a headland on the west coast of Africa, in lat. 26° 7′ N., long. 14° 29′ W. It is the termination of a range of the Atlas Mountains. The Portuguese doubled this cape in 1432.

BOK, EDWARD W., an American journalist; born in Holland, in 1866, of an old and well-known family. He came to the United States at the age of six years, and soon turned his attention to literature, in which his success, owing to his remarkable commercial instinct, was phenomenal. For some time he was associated with *Scribner's Magazine* in New York, quitting it in 1889 to undertake the editorship of the *Ladies' Home Journal* of Philadelphia. In seven years he made this into one of the most valuable magazine properties in the United States. The youngest of American magazine editors, his exploitation of new and generally young authors has been marked with considerable genius for discovery of merit, and has been rewarded with considerable success.

BOKER, GEORGE HENRY, poet and diplomatist, was born in Philadelphia, Oct. 6, 1823, and died there, Jan. 2, 1890. After graduating at Princeton, he studied law and traveled in Europe. On his return he wrote poems and plays, several of the latter being brought out successfully, notably his *Anne Boleyn* and *Francesca da Rimini.* Under Grant he served as Minister to Turkey (1871–75), and to Russia (1875–79), and, returning in 1878, was elected president of the Union League, which, in 1862, he had helped to form. This position he occupied until his death. His tragedy, *Calaynos*, was performed with success in England. *Poems of the War* are his best-known productions.

BOKHARA, a Russian vassal state in central Asia. See BOKHARA, Vol. III, pp. 1–3.

The account to which reference has just been given closes with a description of the treaty signed in 1868 by Bokhara and Russia. The conditions of that treaty permit Russian trade in Bokhara. Also, under compulsion, Mir Muzaffar-ed-Din, by the same document, ceded to Russia the fertile region which now forms the district Syr-Daria. A later treaty (1873) provides that no foreigner shall be permitted to enter the territory of Bokhara unless supwith a Russian passport. Bokhara has thus virtually become a complete dependency of Russia.

There are produced in this state large quantities of corn, fruit, silk, tobacco and hemp. Large herds of sheep, goats, horses and camels graze upon the upland plains. The silk product amounts to about 1,000 tons each year, and of cotton 30,000 tons are produced annually. The chief mineral products are gold, salt, alum and sulphur. The value of the annual imports is $12,800,000; of the exports, $12,000,000. By treaty of 1873 with Russia, the import and export goods of the merchants of that nation pay but an *ad valorem* duty of 2½ per cent, no other tax being levied upon Russian goods, which are also exempt from transit duty. Imports of spirituous liquors, save for the use of the Russian embassy, is forbidden.

The Russian Transcaspian railway passes through

Bokhara from Charjui, on the Oxus River, to within a few miles of the capital, and thence on to Samarkand. Bokhara (q.v., Vol. III, p. 3), is also the name of the capital, whose population is more than 100,000. Other cities of importance are: Karshi, 25,000; Hissar, 10,000; and Charjui, 10,000. The ameer, Sayid Abdul Ahad, succeeded to the throne in 1885. At his command there is a standing army of 20,000 infantry, which has been armed with Russian rifles and instructed in the military drill of that nation.

See *Travels into Bokhara* (Burnes, 1839); *History of Bokhara* (Vambery, 1873); *Russia in Central Asia* (Hon. G. Curzon, 1889); *From London to Bokhara* (Col. O. Le Messurier, 1889).

BOLAN PASS, an Asian mountain pass in Baluchistan. Its highest point has an elevation of 5,793 feet, and the ascent averages 90 feet to the mile. In 1839 British troops marched through this pass, which is 50 miles long, on their way from Sind to Afghanistan. A river of the same name rises in the pass. The Mushkof Bolan railway, completed in 1895, takes advantage of the natural passage afforded by this pass.

BOLAS (Spanish, "balls"), a weapon of offense used by the natives and *gauchos* of southern South America. It consists of two heavy balls, or *bolas*, generally of stone or iron, covered with leather, connected by a plaited thong 6 to 8 feet long. One bola is held in the right hand, while the other is swung rapidly round the head, at the full extent of the thong, and both are discharged at the animal to be captured, so as to wind round its feet and bring it to the ground. The bolas are usually thrown from horseback, and with remarkable accuracy by the Indians and *gauchos*.

BOLDINI, GIOVANNI, *genre* and portrait painter; born at Ferrara, Italy, in 1844. Early in his artistic career he removed to Paris and became identified with the French school. The daylight and sunshine of his pictures, and the warmth and clearness with which they are painted, give evidence of the exceptional talent of their executor. His technique is unsurpassed, and his paintings, usually of small size and minute finish, are highly esteemed by connoisseurs. His work is done in the fashion of Fortuny. In 1889 he won a medal of honor at the Paris Exposition. *Scene in an Orchard* and *Lady Sitting under a Tree and Feeding Poultry* are among the most admired of his achievements. *The Parisians* and *Ladies of the First Empire*, painted by him, are in a private art collection in New York City.

BOLE, a mineral, known also as Berlin red, Bohemian red, French red and English red. See MINERALOGY, Vol. XVI, p. 425.

BOLERO, a Spanish national dance, invented in 1780 by the dancer, Sebastian Zerezo. It is danced in moderately quick three-quarter time, originally and usually by two persons and to the accompaniment of the castanets and the guitar. The name is also applied to the air to which it is danced. Like the fandango, it is said to have had its origin in an African dance, still performed by the Congos, under the name of *chika*. It has been danced in ballet in many places, and the mimic representation, by the dancer, of varying emotions, has been imitated in many other dances.

BOLETUS, a genus of fungi resembling, in form, the common mushroom, but easily distinguished by the fact that the under surface of the cap bears numerous small pore-like openings instead of gills. It is generally found on the ground in woods and meadows, especially in pine woods, and in moist, warm seasons it sometimes appears in prodigious quantities. Among the edible species are *B. edulis*, with thick stalk; *B. scaber*, with slender stalk and rough cap; and *B. luteus*, with a ring on the stalk. *B.luridus* is poisonous, being recognized by its red pores, and also by the fact that the flesh quickly turns blue upon exposure to the air.

BOLGRAD, a town in the Russian province of Bessarabia, 30 miles northwest of Ismail, and at the head of Lake Yalpukh. It is near the frontier between Russia and Rumania, and was in the possession of Turkey from 1856 to 1878; is on the railway between Galatz and Koshinef; is well built, and has considerable trade, and manufactories of soap, candles and pottery. Population, 9,000.

BOLIVAR, a northwest department of the republic of Colombia, South America, is bounded on the north by the Atlantic Ocean; on the east by the departments of Magdalena and Santander, from which it is divided by the Magdalena River; on the south by Antioquia; and on the west by Cauca and the Atlantic. Its area, only about half of which is inhabited, is 21,345 square miles; population, 325,000. The eastern part of the department is low and flat, the mountain system of the country entering only the western portion of the department. The Magdalena and its important tributary, the Cauca, are the largest rivers. Cartagena, the capital, is situated upon the coast, and has a population of 20,000. It is the terminus of a railroad which runs to Calamar and then up the valley of the Magdalena.

BOLIVAR, one of the smallest of the sixteen provinces of Ecuador, South America. The provinces of Rios, León, Tunguragua and Chimborazo surround Bolivar, which occupies a lofty, central plateau, and possesses great, but undeveloped, wealth in timber. The province has a population of 43,000, and its capital, Guaranda, in ancient times a populous and glorious city, now contains no more than 4,000 people.

BOLIVAR, the capital of Polk County, southwestern Missouri. It is in a well-farmed region, and 30 miles N. of Springfield. Jefferson City is 110 miles N.E. Bolivar has cotton and woolen goods factories and flour-mills. The Southwest Baptist College is located here. Population 1890, 1,485.

BOLIVAR, capital of Hardeman County, southwestern Tennessee, is situated on Hatchee River, at the head of navigation, 28 miles by rail S. of Jackson, and 68 miles E. of Memphis. It is the seat of St. James Female College and of a number of academies. It has extensive water-power, and contains various prosperous manufactories. The surrounding country is well timbered and watered, and fertile for cotton. Population 1890, 1,100.

BOLIVAR, state and city of Venezuela, South America. The state is the largest and least popu-

lous in Venezuela, having an area of 169,824 square miles, and a population of 72,681, or less than .43 per square mile. Prior to 1891 the area of the state was 88,701 square miles, but in that year the territory of Yuruari, with an area of 81,123 square miles and 22,392 inhabitants, was incorporated with it. Bolivar is bounded on the north by the Apure and the Orinoco rivers from the 70th meridian to the mouth of the Orinoco; on the east by British Guiana; on the south by Brazilian Guiana and the upper Orinoco; on the west by the United States of Colombia and the 70th meridian. (See VENEZUELA, Vol. XXIV, p. 140.)—The city of BOLIVAR, formerly Angostura, is in the north-central part of the state. It stands at the narrows of the Orinoco River, 240 miles above its mouth, and may be reached only by small sea-going vessels, though river craft of all kinds come to its wharves. The chief exports are cotton, cocoa, sugar, hides and jerked meat. Population, 11,686.

BOLIVIA, a republic of South America. In Vol. IV, pp. 10–18, is given a complete description of Bolivia and her history down to 1875. In 1879 the claim made by Chile to the nitrate region, in the Bolivian province of Atacama, led to the declaration of war by that country against Bolivia, to whom Peru gave her support. The allied forces were defeated, and victorious Chile demanded from Bolivia withdrawal from the sea-bordering province of Atacama and the payment of a heavy indemnity. Bolivia's loss of her seaboard deprived her of free external communication, and necessarily checked her progress. The development of the country during the next 10 years was slow, but peace continued without serious interruption, and the small progress made was, unlike that of some of her sister states, not fictitious. To these conditions Bolivia is largely indebted that she is now financially in better condition than any other South American state. During the presidency of Don Aniceto Arce, elected in 1888, numerous Indian revolts occurred, the most serious of which was in 1888, when 8,000 Indians, under the leadership of Villca, made considerable depredations in the territory south of La Paz. In the summer of 1890, General Camacho, who had won prominence by his services in the war against Chile, led a number of revolutionary efforts which were made against the existing government; but in July he and his followers were overcome and suppressed. During the civil war in Chile, Bolivia was the first country to recognize the belligerent rights of the congressional party. She did this upon the 30th of June, 1891, and upon the fall of Balmaceda, the new Chilean government, in recognition of that service, signed a treaty of commercial reciprocity with Bolivia, whereby imports for the latter country were allowed to pass without transit duty through the ports of Chile. Hitherto Bolivian imports had chiefly come in by way of the Peruvian port, Mollendo. Antofagasta, Chile, thus became the main port of entry for such goods, thence transported into Bolivian territory by rail. The elections of 1892 were accompanied by serious disturbances, and armed encounters between the contending parties were numerous. General Camacho, who had provoked the revolts of 1890, was the Liberal candidate for the presidency, while his opponent, ex-Minister Mariano Baptista, who had negotiated the boundary treaty with the Argentine Republic in 1889, received the government, clerical and Conservative support. The announcement of President Baptista's election upon the 3d of May was met by the Liberals with a movement to contest with arms the result of the ballot. A state of siege was proclaimed, and continued until after the inauguration of President Baptista upon the 6th of August. Shortly prior to that inauguration there were banished from Bolivia General Camacho and 16 deputies of the Congress, his ardent supporters. In the same year the peace of the country was again broken by an Indian uprising, more serious than any of its predecessors within the same generation. A prophet, Cururuyuqui, having persuaded the aboriginal tribes of western Bolivia and of the Brazilian and Argentinian borders that the appointed time had come for driving out from the ancestral lands of the Indians the white invaders, thousands of his followers began a work of destruction which did not cease until their crafty leader advised them to withdraw to their homes, until they might arm themselves with better weapons than their primitive poisoned arrows.

A treaty with Chile, negotiated by ex-President Arce, and ratified by the Bolivian Congress in February, 1893, provides for the cession to Bolivia by Chile of a port on the Pacific, and for the latter's assistance in the arming, equipping, and instruction of the Bolivan army. By the same treaty Bolivia severed the historic ties which had bound her to Peru, and became politically and commercially subservient to Chile.

Bolivia has an area of 597,271 square miles, and a population of 2,500,000. The largest and most important cities are Sucre, the present capital, 20,000; La Paz, 40,000; Cochabamba, 25,000; Potosi, 20,000, and Oruro, 15,000. The whites comprise about one quarter of the total population. Roman Catholicism is dominant, and is recognized by the state. Instruction in the primary schools, which number 418, is free and nominally obligatory.

The external debt of Bolivia is but little over $1,800,000; the internal debt, $4,200,000. Her standing army, whose annual cost is $1,300,000, consists of 1,250 men, rank and file. Service in the national guard is compulsory for citizens between 21 and 40 years of age. The production of Bolivia, in proportion to her resources, is poor. Silver, copper, tin and tin ore, rubber, cinchona bark, from which quinine is extracted, and coca, are the exports of chief importance. Agricultural products supply little more than the local demand. Bolivia's mineral and forest wealth is incalculable. The United States and Mexico alone exceed her in the output of silver, but her other resources are almost totally undeveloped. The Bolivian imports have a value of about nine million dollars each year, while the annual exports are valued at from two to three times as much. The railway by which imports are brought from the Chilean port of Antofagasta to the Bolivian frontier at Ascotan, has been extended into Bolivian territory for a distance of about 500 miles.

Numerous concessions have been granted for the construction of other railways. There are about 2,000 miles of telegraph line in the country.

See *Bolivia* (Bulletin No. 55, Bureau of American Republics, Washington, U.S.A., 1892); *Peru and Bolivia* (Charles Wiener; Paris, 1880); *South America: Travels in Bolivia* (Count C. d'Ursel, Paris, 1879); *Foreign Office Reports, No. 1,499* (London, 1895).

BOLKHOV OR BOLKHOFF, a city of Russia, 30 miles N. of Orel, on the River Nugra. It is a well-built city, though the houses are mostly of wood. It has more than 20 churches. The chief trade is in leather, flax, tallow and oils. Manufactures hats, gloves and woolens. Population, 30,000.

BOLL, a Scotch measure for grain and meal, originally the equivalent of six imperial bushels. A two-bushel measure, used in the north of England, has been called the "new boll." As a measure of weight, a boll (of flour) is equivalent to 10 stone, or 140 pounds.

BOLL-WORM. See CORN-WORM, in these Supplements.

BOLOGNA STONE OR BONIAN STONE. Toward the end of the sixteenth or beginning of the seventeenth century, Vincent Casciorolo, a shoemaker of Bologna, made the discovery that the mineral now known as heavy spar (barium sulphate), when reduced to a fine powder, mixed with gum, dried and strongly heated in a covered crucible, is converted into a substance having the property of shining in the dark. Casciorolo communicated his discovery to the alchemist Scipio Bagatello, and the mathematician Maginus, and the latter made the substance famous by the specimens which he sent about. Peter Potier, a French chemist resident in Bologna, first published a recipe for making it. It was called by its discoverer *capis solaris*, but was soon generally called Bologna stone, from the place where it was prepared. Its phosphorescent character depends very much upon its preparation. It shines in the dark only after absorbing light. The now well-known "luminous paint" is composed of this or of similarly prepared sulphids. See LIGHT, Vol. XIV, p. 603.

BOLOMETER, an instrument invented (1881) by Prof. S. P. Langley of the United States, for the measurement of minute differences of radiant heat. Its action is based on the variation of electrical resistance produced by changes of temperature in a blackened metallic conductor. The instrument may be made much more sensitive than a thermopile. It indicates accurately changes of temperature of much less than .0001° F. The bolometer (also called *thermic balance* and *actinic balance*) has been used in the study of the distribution of heat-energy in the solar, lunar and other spectra.

BOLSWARD, an old town in the province of Friesland, which is in the northern part of the Netherlands. The capital of the province, Leeuwarden, is 15 miles N.E. of it. Bolsward contains a fine Gothic church, a number of woolen-goods factories and several dairies, whose products are exported in large quantities. Population, 6,100.

BOLT AND SCREW MACHINES. See MACHINE TOOLS, in these Supplements.

BOLTON, SARAH KNOWLES, author and philanthropist, the wife of Charles K. Bolton, was born at Farmington, Connecticut, in 1840. Her poems and short stories are favorably known and widely read. She became prominent among those devoted to the advancement of woman, and was one of the first corresponding secretaries of the Woman's Christian Temperance Union. A volume of her poems was published under the title, *Orlean Lamar*. Among her other works are *The Present Problem; How Success is Won; Social Studies in England; Famous American Authors; Famous American Statesmen; Famous English Authors; Famous English Statesmen; Famous European Artists; Famous Givers; Famous Leaders Among Men; Famous Leaders Among Women; Famous Men of Science; Famous Types of Womanhood; Famous Voyagers and Explorers; Girls Who Became Famous; Poor Boys Who Became Famous;* and a brochure upon *Employers and Employed.*

BOLTON ABBEY, Yorkshire, England, is situated in a picturesque district on the River Wharfe, 6 miles E. of Skipton, and 18 miles N.W. of Leeds. Founded for Augustinian canons about 1150, it has been celebrated by Wordsworth in *The White Doe of Rylstone* and *The Force of Prayer*. The remains range from Early English to Perpendicular, and the nave of the church has been restored for service. The old barn of the abbey is still in use, and the gateway, familiar through Landseer's famous painting, is a relic of deep interest to antiquarians. See YORK, Vol. XXIV, p. 749.

BOLTZ, AUGUST CONSTANTIN, German linguist, was born in Breslau, Sept. 26, 1819. After several years' connection with various military schools and other establishments during a long residence in St. Petersburg, he returned to Germany and became, in 1864, professor of Russian at the University of Bonn. Shortly afterward he published a *New Course in the Russian Language*, and followed it by similar manuals of the English, Spanish, Italian, and French languages. *Language and Its Life*, and *Introduction to the Study of Sanskrit according to the Latin Inscriptions*, are among his other publications. He edited numerous translations of classical writings.

BOLUS. See VETERINARY SCIENCE, Vol. XXIV, p. 201.

BOMA, the local capital of the Congo Free State, situated on the Congo River, 55 miles above its mouth. It is the seat of the administrator-general, and his staff of district administrators. The town is growing in population and commercial activity; its most important exports are ivory, rubber, coffee, nuts and palm-oil.

BOMBA, an opprobrious epithet bestowed in Italy on Ferdinand II of Naples (1810–59), in consequence of his cruel bombardment of Naples, Messina and other cities of his realm during the revolutionary troubles of 1849.

BOMBARDIER-BEETLE, a name given to several species of beetles, particularly to the genus *Brachinus*, in the subfamily *Carabidæ*. When irritated they discharge a pungent fluid with explosive force from the anal glands. The name refers to this habit, which is largely protective. These beetles occur in both temperate and tropical countries.

BOMBARDMENT, a continuous attack, usually upon a fortress or fortified town, by means of bombs, in order to destroy the fortifications or buildings. In modern times a bombardment is generally adopted as an adjunct to a siege, and is more frequently a naval than a military operation. Military authorities regard the bombardment of unfortified towns a barbarous method of warfare, since it imperils the inhabitants, rather than the armed defenders. Accounts of the famous bombardments of history may be found under their appropriate headings.

BOMBAX, a genus of tropical American trees of the family *Malvaceæ*. The stems are large and barrel-shaped, the wood very light and soft, and the flowers large and showy. It is one of the "silk-cotton trees," so named because the capsule is lined with long silky hairs, which, however, are too brittle to be used as are the hairs developed from the seeds of the regular cotton plant (*Gossypianthus*), a member of the same family. Closely related is the "baobab tree"; which see.

BOMBAY DUCK OR BUMMALOTI (*Harpodæ nehereus*), the commercial name of a member of the lizard-fish family, found in Indian seas. It is an important article of export, and large quantities are sent from Bombay.

BOMBAY HOOK ISLAND, an island of Kent County, Delaware, extending along the shore of the Delaware River, from Woodland, 10½ miles S., and separated from the mainland by Old Duck Creek. On its north end, at lat. 39° 21′ 46″ N., long. 75° 30′ 19″ W., stands a lighthouse with a fixed white light 46 feet above the water.

BOMBAZINE, a dress fabric whose distinguishing characteristic is that the warp is silk and the weft worsted. It was manufactured in England as early as the reign of Elizabeth. The fabric is now little used. For the origin of the name, see HIERAPOLIS, Vol. XI, p. 791.

BOMBERGER, JOHN HENRY AUGUSTUS, theological and biblical writer, was born upon the 13th of January, 1817, in Lancaster, Pennsylvania; died Aug. 19, 1890, at Ursinus College, Pennsylvania, whose president he had been since 1870. He published *Five Years at Race Street Church; The Revised Liturgy; Reformed, not Ritualistic;* and translated and condensed into two volumes Herzog's *Protestant Theological and Ecclesiastical Encyclopædia.*

BOMFORD, GEORGE, chief of ordnance in the United States army, was born in New York in 1780; died in Boston, Massachusetts, March 25, 1848. Having graduated from West Point in 1805, he was appointed to the engineering corps, and during the War of 1812 served as assistant commissary general of ordnance, having attained the rank of major. "Columbiads" bomb-cannons constructed after a pattern invented by Major Bomford, were put into general use at that time. On the 30th of May, 1832, he was appointed colonel and chief of the newly organized ordnance corps. From 1842 until his death he served as inspector of arsenals, ordnance, arms and munitions of war.

BONA DEA ("the good goddess"), a Roman divinity who is variously described as the wife, sister or daughter of Faunus. She was worshiped by the women of Rome from the most ancient times. Her sanctuary was a grotto on Mons Aventinus, but her festival (the 1st of May) was celebrated in the house of the consul. At this celebration no males were allowed to be present; even portraits of men were veiled. The solemnities were generally performed by high-born vestals.

BONA FIDE, a Latin expression which, through its general use as a legal term, has become Anglicized, and means, "in good faith" or "with sincerity." *Bona fides* or good faith, as distinguished from *mala fides* or bad faith, is a test which is very frequently applied by the courts to determine the rights of parties to a transaction, and when applicable is usually decisive of such rights. A *bona fide* purchaser is one who purchases for a valuable consideration, and in the belief that the vendor had the right to sell and without the knowledge of any suspicious circumstances to put him upon inquiry. A *bona fide* purchaser of commercial paper before maturity obtains such title as will exclude any defense which the maker may have had against a prior holder, except fraud in the execution of the instrument. In a suit, therefore on a note which has been assigned before maturity, the question of the *bona fides* of the purchase is usually the only issue involved. But to constitute a *bona fide* sale, a consideration of value must pass at the time, and it will not be such a sale if for a consideration to be given in the future, or one not of value, as, in consideration of love and affection. A contract where one of the parties has not acted *bona fide* in entering into it, is generally voidable at the option of the other party. In equity jurisprudence especially, the *bona fides* of a transaction is frequently examined with rigid scrutiny. Trustees and others exercising duties of trust are required to transact the business of their trust strictly in good faith.

BONAIRE. See BUEN-AYRE, in these Supplements.

BONANZA (Spanish, "prosperity"), a term originally applied in the mining territories of the United States to the discovery of a rich vein, or "pocket." A mine was said to be *in bonanza* when producing profitable ore. It has since been used of successful enterprises generally, in the sense of a "mine of wealth."

BONAPARTE, a village of Van Buren County, southeastern Iowa, situated on the Des Moines River, about 35 miles N.W. of Keokuk, and on the Chicago, Rock Island and Pacific railroad. It contains an academy, flouring-mills, sash, door and blind factories, and one of the largest woolen factories west of the Mississippi. Population in 1895, 923.

BONAPARTE, ELIZABETH PATTERSON, the wife of Jérôme Bonaparte, was born in Baltimore, Maryland, Feb. 6, 1785; died there, April 4, 1879. Her father, William Patterson, had emigrated from Ulster, Ireland, to the United States. He became a ship-owner and one of the wealthiest men in Maryland. At a ball in Baltimore Miss Patterson was introduced to Jérôme Bonaparte, a youth of 19, brother of Napoleon, who had been serving in the French navy in the West Indies. He made a pro-

posal of marriage, which she accepted, and her father opposed. The contract was drawn up by Alexander J. Dallas, and the marriage ceremony performed by Archbishop Carroll in Baltimore, Dec. 24, 1803. Napoleon was deeply enraged at the marriage and undertook to declare it null and void, excluded Jérôme from his dynasty, and threatened him with imprisonment unless he consented to repudiate his wife. In 1805 Jérôme and Elizabeth embarked for Europe and arrived in Lisbon, April 2, 1805. She was not permitted to land, and, leaving her, Jérôme met Napoleon at Alessandria. The Emperor remained obdurate, but declared that if Miss Patterson would return to the United States and resume her own name he would give her a pension of 60,000 francs. In the mean time her vessel went to Amsterdam, but was prevented from landing, and Mme. Bonaparte sought refuge in England, where her son, Jérôme Napoleon Bonaparte, was born, at Camberwell, near London, July 7, 1805. Convinced that her husband was about to yield to a divorce, Mme. Bonaparte returned to Baltimore. Napoleon applied to Pope Pius VII to annul the marriage, but he refused, and it was dissolved by the imperial council of state. Jérôme was created prince of the empire, was promoted admiral, and subsequently received the rank of general. In 1806 he was made successor to the imperial throne in the event of Napoleon leaving no heir, and in 1807 was made king of Westphalia. On Aug. 12, 1807, he married Catherine Frederica, princess of Württemberg. By this marriage he had three children. Mme. Bonaparte, although obtaining a divorce in the Maryland courts, unsuccessfully employed every legal means to maintain the legitimacy of her son, but Jérôme appealed to the council of state, which forbade Jérôme "Patterson" from calling himself Jérôme Bonaparte. Her last effort was in 1860, after the death of Jérôme, when the eloquent Berryer pleaded her cause. Mme. Bonaparte visited Europe after the overthrow of Napoleon at Waterloo, spending the rest of 1815 in England and Paris. Louis XVIII invited her to court, the Duke of Wellington admired her, and Talleyrand praised her wit. In 1816 she returned to Baltimore, but went again to Europe in 1819, and visited the Princess Borghese (Pauline Bonaparte) in Rome, by whom she was kindly received. During this visit she met her former husband in Florence. She left a fortune of $1,500,000 to her grandsons, Jérôme Napoleon Bonaparte, a gallant French soldier, who died at Beverly, Massachusetts, Sept. 3, 1893, and Charles Joseph Bonaparte, a lawyer in Baltimore. See also *Jérôme Bonaparte*, under BONAPARTE, Vol. IV, p. 30.



MADAME BONAPARTE.

BONAPARTE, JÉRÔME NAPOLEON, son of Jérôme Bonaparte, by his first wife, Elizabeth Patterson Bonaparte; was born in Camberwell, England, July 7, 1805; died in Baltimore, Maryland, June 17, 1870. He graduated from Harvard and studied law, but never became a practitioner. Having married Miss Williams of Roxbury, Massachusetts, he traveled to France, where a considerable part of his life was spent. He bore a striking personal resemblance to Napoleon I.—JÉRÔME NAPOLEON BONAPARTE, his son, was born in Baltimore in 1830, and graduated from West Point in 1852. For two years he served as lieutenant in the mounted riflemen on the Texas frontier, and then entered the army of France, with which he served with gallantry and distinction in the Crimean War and in the campaign of 1859 in Italy. He also won honors in the Algerian expedition of 1856–57. Upon the fall of the Empire in 1870, he contrived to escape the Commune, but having been formally banished in 1886, he removed to the United States, where he died, at Beverly, Massachusetts, Sept. 3, 1893.—His younger brother, CHARLES JOSEPH BONAPARTE, was born in Baltimore, June 9, 1851, and after graduation from Harvard, studied law and was admitted to the bar at Baltimore, where he practiced for many years.

BONAPARTE, LUCIEN LOUIS, cardinal, was born in Rome upon the 15th of November, 1828. His line of descent is direct from Lucien, the brother of Napoleon Bonaparte. He early entered the priesthood, and became a cardinal upon the 13th of March, 1868.

BONAPARTE, NAPOLEON JOSEPH CHARLES PAUL, Prince de Montfort, generally known as Prince Napoleon (Jérôme), and commonly as Plon-Plon, was the son of Jérôme Bonaparte, some time king of Westphalia, and younger brother of the great Napoleon. His mother was the Princess Catherine, of Württemberg, whom Jérôme Bonaparte was forced to marry, notwithstanding his previous lawful union with Miss Patterson of Baltimore. Prince Napoleon was born in exile at Trieste, on the Adriatic, on Sept. 9, 1822, and died at Rome, March 7, 1891. He was recognized as the heir of his cousin, Napoleon III, in case the latter should die without issue. His wife was the daughter of King Victor Emmanuel.

BONAR, REV. DR. HORATIUS, Free Church minister and hymn-writer, was born in Edinburgh, Dec. 19, 1808; died there, July 31, 1889. Educated at the high school and University of Edinburgh, he was ordained to the ministry at Kelso in 1837, where he remained for nearly 30 years. He afterward took charge of Chalmers's Memorial Free Church, Edinburgh. For a time editor of the *Christian Treasury*, *Presbyterian Review*, and *Quarterly Journal of Prophecy*, he published, besides, more than 20 volumes of a religious character, but is best known as the author of *Hymns of Faith and Hope* (three series, 1857–66), selections from which have found their way into all collections for church use.

BONARD, LOUIS, born in Rouen, France, in 1809; died in New York City, Feb. 20, 1871. He came to New York in 1851, and lived a secluded life in apparent poverty and squalor. Shortly before

his death he sent to Mr. Henry Bergh a notice that he bequeathed $150,000 worth of property for the use of the Society for the Prevention of Cruelty to Animals. In the wretched dingy room where he had lived was found a large trunk filled with gold and silver watches, diamonds and jewelry.

BONASIA, a genus of birds of the grouse family. The hazel-grouse of Europe and the American ruffled grouse, pheasant or partridge (*B. umbellus*) are examples. All are excellent as food, and are highly prized game-birds.

BONAVISTA, a bay, a cape and town on the northeast coast of Newfoundland. The town is a port of entry, and one of the oldest settlements in the island. Its people are mostly fishermen, but agriculture is also carried on. Population, 3,500.

BONCHUT, ERNEST, a French physician who wrote extensively concerning the diseases of children. He was born May 16, 1818, and died in 1892. As the foremost authority in his specialty, he was a member of the medical faculty of Paris. His numerous books include *A Treatise upon the Diseases of the Newborn; Hygiene of the First Infancy;* and *New Elements of General Pathology.*

BOND. A bond is an obligation, in writing and under seal, to pay money. It may not be, but usually is, conditioned that if the obligor does some particular act or refrains from some act therein named, the obligation shall become void, but otherwise to remain in full force and effect. The amount of liability to be incurred upon a breach of the condition is generally limited in the bond to a sum certain. A bond is not negotiable, and only the person to whom the bond is given, called the obligee, can recover the penalty. Upon the breach of the conditions of a bond, it may be forfeited and suit instituted against the surety to recover the penalty. Formerly, upon forfeiture of a bond to secure the payment of money, the entire amount of the penalty might be recovered, but courts of equity have modified the rule so that the amount of the principal, interest, expenses and damages only are recoverable, but, at any rate, not to exceed the amount of the penalty. See OBLIGATION, Vol. XVII, p. 704.

BOND, EDWARD AUGUSTUS, an English scholar and editor, was born at Hanwell, England, Dec. 31, 1815. In 1838 he became keeper of the MSS. in the British Museum, and in 1878 was appointed principal librarian. He has published catalogues of MSS. and *fac-similes* of Anglo-Saxon charters in the museum, and, among other works, has edited the *Statutes of Oxford University* (1853), Fletcher's *Russe Commonwealth* and Horsey's *Travels in Russia in the Sixteenth Century* (1856) for the Hakluyt Society; *Speeches in the Trial of Warren Hastings* (4 vols., 1859–61), and *Chronica Monasterii de Melsa.* He has also helped to edit the *Fac-Similes* published by the Palæographic Society, of which he is a founder and president.

BOND, GEORGE PHILLIPS, astronomer, the son of William Cranch Bond; was born at Dorchester, Massachusetts, on the 20th of May, 1825. In 1859, fourteen years after his graduation from Harvard, he was appointed professor of astronomy and director of the observatory of that institution. In 1862 Professor Bond, for his work on the Donati comet, was awarded a gold medal by the Royal Astronomical Society of London. Among his numerous contributions to astronomical literature are *A Treatise on the Construction of the Rings of Saturn* and *Elements of the Orbits of Hyperion and the Satellite of Neptune.* He died in Cambridge, Massachusetts, Feb. 17, 1865.

BOND, WILLIAM CRANCH, astronomer, was born in Portland, Maine, Sept. 9, 1789. While engaged in the trade of watchmaking, he studied in an observatory which he built for himself at Dorchester, Massachusetts. In 1838 he accompanied a United States exploring expedition to the Southern Ocean, and during the succeeding year superintended the erection of the Harvard Observatory, whose first director he became. His observations on Saturn and the fixed stars made him famous. He discovered the single moon of Neptune. The photographical records made by him of heavenly bodies were almost the first successful ones. His death occurred at Cambridge, Massachusetts, Jan. 29, 1859.

BONDAGER, a term applied in the south of Scotland and in Northumberland to a female laborer whom a "hind," or married farm-worker, undertakes to supply to his landlord for the regular field-work on a farm as a condition of his tenancy of his house. She is frequently a member of his own family, or she may be merely engaged and boarded by him. The origin of the bondager system is the want of a sufficient rural population for the field-work of the neighborhood.

BÖNDAR OR BÖNDER, a class of yeomanry or small landed freemen in Sweden, not belonging to the nobility. See SWEDEN, Vol. XXII, p. 744.

BONDED WAREHOUSE, a storehouse for bonded goods. The warehousing system lessens the pressure of customs duties by postponing payment of them until the goods on which they are levied are required by the importer, when he pays the duties and the goods are released. Until that time the taxable property is under the supervision of the revenue officers, but no compensation will be made for damage sustained by fire or other accident occurring in the warehouse. The system in the United States dates from 1846. See FINANCE, Vol. IX, p. 184.

BONDI, CLEMENTE, an Italian poet; born at Mezzano, in Parma, June 27, 1742; died at Vienna, June 20, 1821. He was educated by the Jesuits, and when still very young was appointed to deliver lectures on rhetoric in the Royal Convent at Parma. Here he produced his first work, *Giornata Villereccia* (1773). For having celebrated in verse the abolition of the Jesuit order he was compelled to fly to the Tyrol. He found a patron in the Austrian Archduke Ferdinand, who appointed him his librarian at Brünn. Later he lived at Vienna. His poems are lyrical, descriptive, satirical, and elegiac, written in pure style and graceful verse.

BONE-ASH OR BONE-EARTH is obtained by the complete combustion of bones in an open furnace. (See PHOSPHORUS, Vol. XVIII, p. 815.) Bone-ash of good quality contains about 80 per cent of phosphate of lime, and 20 per cent of car-

bonate of lime, phosphate of magnesia, soda and chlorid of sodium. It is employed to some extent as a source of phosphorus and in the making of cupels for the process of assaying; but the most extensive use is in the manufacture of artificial manures. Many thousands of tons of bones are annually exported from South America to Europe for this purpose. India also contributes a large amount.

BONE-BEDS, the name given by geologists to thin beds or layers which are largely made up of the fragments of bones, or in which bones and teeth occur in conspicuous quantities. One of the best known is the Ludlow bone-bed. (See GEOLOGY, Vol. X, p. 336.) Others are the Bettes bone-bed of the Bradford coal-measure, the Rhætic bone-bed, and the Tilgate stone of the Wealden series. In the bone-beds of the more recent geological age mammalian remains abound, as in the Suffolk bone-bed of the Coralline eras.

BONE-BLACK OR ANIMAL CHARCOAL. See CHARCOAL, Vol. V, p. 399.

BONER, JOHN HENRY, editor and author; born on the 31st of January, 1845, at Salem, North Carolina. After several years' experience in politics and newspaper-work in his native state, he became connected with the civil service at Washington. In 1887 he was chosen one of the editors of the *Century Dictionary*, and afterward joined the editorial staff of the *Standard Dictionary*. For a time he was the literary editor of the New York *World*. *Whispering Pines* is the title of a volume of poems written by him.

BONESET (*Eupatorium perfoliatum*), an herbaceous plant belonging to the family *Compositæ*, and native to the United States. Its hairy, opposite leaves clasp, and are united around the stem. They are deeply notched, much veined and wrinkled. The small flowers are borne in inflorescences of the corymb type. The plant has a bitter taste, and grows abundantly in low and moist places. It is valued for the medicinal properties of an infusion of its leaves, which is used as a tonic and purgative.

BONGHI, RUGGIERO, Italian writer and statesman, was born at Naples, March 21, 1826. At the beginning of the revolutionary movement of 1848 he established a journal in Florence, *Il Nazionale*, and he took an active part in the events up to 1849, for which he was exiled from the kingdom of Naples. He then formed a close friendship with Manzoni and Rosmini, and again took up his philosophic studies. In 1857 he published an important translation of Aristotle's *Metaphysics*, and in 1858 a new edition of the works of Plato. In 1859 he was made professor of philosophy at the new academy at Milan, and the following year entered the Italian Parliament. In 1863 he started at Turin a journal, *La Stampa*, in the cause of moderate democracy, and in 1864 was appointed professor of Greek literature in the university of that city. Subsequently he returned to his chair at the academy at Milan, and there edited *La Perseveranza*. From Milan he went to the university at Rome as professor of ancient history, thence to Naples in 1872 to assume direction of the *Unità Nazionale*. On Oct. 3, 1874, Signor Bonghi was appointed Minister of Public Instruction in the Minghetti Cabinet. He did much to promote education in Italy. Died Oct. 22, 1895, near Naples.

BONGOS, African tribe. See AFRICA, in these Supplements.

BONHAM, a city of northeastern Texas, county seat of Fannin County, situated on Bois d'Arc Creek, and on the Texas and Pacific railroad, about 30 miles E. of Sherman. It is the trade center of a fertile prairie district, in which great quantities of wheat, oats, corn and other cereals, and more than 25,000 bales of cotton annually, with large amounts of broom-corn and tobacco, are raised. The manufactures include flour, machinery, carriages and wagons, brooms, mattresses and tobacco. Bonham is the seat of Bonham Masonic Female Institute. Population 1890, 3,361.

BONHEUR, JULES ISIDORE, sculptor, brother of the artist, Rosa Bonheur, was born on the 15th of May, 1827, in Bordeaux, France. While studying painting under his father, he devoted a part of his time to modeling groups of animals, and at the Salon of 1848 exhibited *Combat between a Lion and an African Chasseur*, in both statuary and painting. Since that time he has received two awards of honor at the Salon, and a gold medal at the exhibition of 1889. Among his achievements in sculpture are *Dromedary; Royal Tiger; Lioness and Young; Bull;* and *Children and Dogs*.

BONHEUR, MARIE ROSALIE (ROSA), a French artist, born at Bordeaux, March 22, 1822. She received her first instruction from her father, Raymond Bonheur, an artist of merit, who died in 1853. In 1841 she figured for the first time in the Salon, showing a couple of small works—*Two Rabbits* and *Goats and Sheep*—that indicated the department in which she was to attain future eminence. These were followed by a number of finely finished compositions, and in the year 1849 she produced what some consider her masterpiece, *Plowing with Oxen*, now in the Luxembourg. Her famous *Horse Fair* was the chief attraction of the Salon in 1853. It was purchased in 1887 from the Stewart collection by Mr. Cornelius Vanderbilt for $53,500, and by him presented to the Metropolitan Museum of Art of New York. In 1865 she exhibited a large landscape, *Haymaking in Auvergne*. In 1853 she became entitled to the cross of the Legion of Honor, but because of her sex the decoration was withheld until 1865. During the siege of Paris (1870–71) her studio and residence at Fontainebleau were spared by special order of the then Crown Prince of Prussia. Her success in painting animals has been largely due to her conscientious study of living subjects.


ROSA BONHEUR.

BONHOMME, JEAN FRANÇOIS HONORÉ, politician and author, was born at Tremblade, France, Jan. 29, 1811. From being secretary to a subprefect, he rose to a subchiefship in the Depart-

ment of Finance, which office he held until 1866, when he decided to devote his entire attention to literature, his official duties having told severely upon his health. His more important writings, largely of an historical nature, are *Madame de Maintenon and her Family; Louis XV and his Family; Madame de Pompadour; General of the Army;* and *The Last Abbé of the Court.* The *Unedited Works* of Piron were published by him. Of poetry and prose sketches he has written *Through the Flowering Bushes; The Daughter of Dancourt;* and *The Exile of Ovid.*

BONIFACIO, STRAIT OF. See SARDINIA, Vol. XXI, p. 307.

BONIN OR (Japanese) OGASAWARA ISLANDS, a volcanic group in the Pacific Ocean, 700 miles S.E. of Japan, having an area of 32 square miles. They were discovered by Quast and Tasman in 1639, and were taken possession of for Britain in 1827, by Captain Beechey, but in 1878 the Japanese reasserted their sovereignty, with the view of making the islands a penal settlement. See also JAPAN, Vol. XIII, p. 570.

BONINGTON, RICHARD PARKES, painter in oil and water colors; born at Arnold, near Nottingham, England, Oct. 24, 1801. He first took lessons of Louis Francia, the water-color painter. He afterwards studied in Paris—in the Louvre, at the Institute, and under Baron Gros. His water-colors sold rapidly. In 1822 he began to exhibit in the Salon, and received a premium from the Société des Amis des Arts for his views of Havre and Lillebonne. About this time he began to occupy himself with lithography. A fine collection of his work of this kind is preserved in the printroom of the British Museum.

In 1825 he took up oil-painting, and in that year visited England and Italy, subsequently producing his splendid Venice views of the *Ducal Palace* and the *Grand Canal,* which figured in the Salon of 1827, with his *Francis I and the Queen of Navarre* and his *Henry III Receiving the Spanish Ambassador.* He also exhibited in the Royal Academy and the British Institution. His high rank was at this time fully assured, but having contracted an attack of brain fever from exposure while sketching in the sun, his health failed. He visited London for medical advice, and died there, Sept. 23, 1828.

Of late years the fame of Bonington has been rapidly increasing, and he is recognized as a most accomplished and original painter of landscape and architectural subjects, as well as of scenes of historical *genre.* He is especially admired for the purity and brilliancy of his coloring.

BONITO, a name common to several fishes of the mackerel family (*Scombridæ*), and to others related to them, or supposed to resemble them. The *Euthynnus pelamys,* sometimes called the stripe-bellied tunny, and of the same genus as the tunny, is well known to sailors as an inhabitant of the tropical parts of the Atlantic and Indian oceans, and as one of the fishes most frequently seen pursuing the flying-fish. It is steel-blue in color, darker on the back, and whitish below, and is marked with four dark longitudinal lines on the belly. When fresh, its flesh is not considered wholesome. The *Sarda mediterranea* is the *bonito* of American fishermen and markets, and the *belted bonito* of many writers. It is of the same color, but is distinguished by oblique stripes. It is plentiful in the Black Sea, and has been found in the North Sea. Its flesh is valued for food. *Sarda Chilensis,* closely related to *S. mediterranea,* occurs in the Pacific Ocean. It is known as *bonito* along the California coast, but also miscalled "Spanish mackerel," and is highly esteemed for food. *Auxis thazard* is of a more uniform blue color, without stripes or bands, and having widely separated dorsal fins. It is the plain bonito of the English, but along the New England coast is called "frigate mackerel." Its flesh is little esteemed when fresh.

BONNAT, LÉON JOSEPH FLORENTIN, painter, foremost in the modern French school, was born at Bayonne, June 20, 1833. He studied at Madrid under Frederic Madrazo, and in Paris under Léon Cogniet. Having gained the second *grand prix de Rome,* aided by his friends, he went to Italy to study art in 1858, and remained there for four years. He was first brought into prominence by his *Adam and Eve Finding the Body of Abel* (1860), now in the gallery at Lille, and his much-praised *Pasqua Maria* (1863). He has devoted himself to Italian *genre* pictures of moderate size, varied by such religious subjects as *The Assumption* (1869), and the realistic *Christ on The Cross* (1874), commissioned for the Palais de Justice, Paris. Several remarkable portraits have been painted by him; among others, those of MM. Thiers and Victor Hugo. A number of his paintings are in the private galleries of wealthy Americans in New York and Chicago, and a splendid portrait in the Metropolitan Museum, New York, of J. T. Johnson, one of its founders, is by Bonnat. He is president of the Society of French Artists.

BONNEMÈRE, JOSEPH EUGÈNE, a French author and dramatist; born on the 20th of February, 1813, at Saumur. His *Les Premiers Fiacres* was presented at the Pantheon, Paris, in 1841, and was followed by several other plays, but his fame chiefly rests upon his historical writings, which include *History of the Peasants; The Vendée in 1793; Popular History of France; History of the Wars of Religion in the Sixteenth Century;* and *Peasants of the Nineteenth Century.*

BONNER, ROBERT, an American publisher; born near Londonderry, Ireland, April 28, 1824, of Scotch-Irish parentage. He came to the United States in early youth and learned the trade of a printer; and in 1851 became proprietor of the New York *Ledger,* the subsequent phenomenal success of which was wholly due to his business tact and energy. He made liberal donations to educational and other institutions, principally to the College of New Jersey at Princeton. He is widely known as an admirer of fine horses, and as the owner of the celebrated Maud S. and Dexter.

BONNET OR BONNETTE, in military defense, a part of the intrenchment intended to guard against an enfilading fire. See FORTIFICATION, Vol. IX, p. 427.

BONNET-HEAD (*Sphyrna tiburo*), a large shark characterized by a broad, peculiar-shaped head. It occurs in many tropical seas.

BONNET-PIECE, a Scotch gold coin, so called on account of the king's head being decorated with a bonnet instead of a crown, as was usual. It was first issued in 1539 by James V of Scotland, and worth, at the time of issue, 40 shillings Scotch. James V was the first Scottish sovereign to place dates on his money, and to diminish the size of coins by increasing their thickness. His bonnet-pieces were struck of native gold, and are now much prized by collectors.

BONNEVILLE, LAKE, the name given to an extinct body of water which once covered the Great Basin of Utah. See UTAH, Vol. XXIV, p. 19; and UNITED STATES, Vol. XXIII, pp. 794–95.

BONNEVILLE, NICHOLAS DE, one of the earliest French students of German literature, was born at Evreux, March 13, 1760; died in Paris, Nov. 9, 1828. Among his earlier works are *Nouveau Théâtre Allemand* (12 vols., 1782–85), a collection of German tales, and a translation of Shakspeare. After the revolution, he edited several newspapers, but his moderation and liberality rendered him obnoxious to the ruling party, and he was temporarily imprisoned. His speeches and writings also found disfavor with Napoleon. Among the few of his writings still current are his *History of Modern Europe* and *The Spirit of Religions*.

BONNY OR BONI, a town and river of Guinea, now in the British Niger protectorate. The river forms an eastern debouchure of the Niger, and falls into the Bight of Biafra. It is accessible at all times of the tide to vessels drawing as much as 18 feet of water, and safe anchorage at all seasons of the year is found within its bar. Its banks are low, swampy and uncultivated. On the east side near its mouth is the town of Bonny, notorious from the sixteenth to the nineteenth century as the rendezvous of slave-trading ships. The houses forming the town stand in a swamp, where fever prevails. European traders generally take up their quarters on river boats moored in the current of the Bonny. It exports considerable quantities of palm-oil.

BONUS, as a legal term, means a premium or a sum of money paid in excess of the amount usually paid under such circumstances. It is not a gift, but rather an extra consideration, as where money is paid in excess of the legal rate for the purpose of procuring a loan, or where a sum of money or other consideration is given to a manufacturing establishment to procure its location at a certain town, or money paid by a street-car company to a city for the purpose of obtaining a franchise or license to operate its railway over the public streets. The term is also used to denote an extra dividend given to the stockholders of a corporation out of accumulated profits.

BONYHAD OR BONHARD, a market town of Hungary, in the county of Tolna, about 150 miles S. of Budapest. It has some trade in corn, wine and tobacco. Population, 5,970.

BONY PIKE (*Lepidosteus viridis*), a member of the Ganoids, confined to the brackish waters of the temperate regions of North America, Central America and Cuba. They are characterized by hard, bony, quadrangular scales covered with a bony enamel. Their vertebræ are completely ossified. They breathe atmospheric air, and must rise to the surface to breathe. They are mixogamous. They attain a maximum length of six feet, an average of three feet. They feed on other fishes. They are of interest as the living type of a fossil species, of the Tertiary period, abundant both in Europe and America. The bony-pike, as well as its congener, the gar-pike, is used as an article of food.

BOOBY (*Sula leucogastra*). See GANNET, Vol. X, p. 71. The booby is a species of gannet which has received this name from its apparent stupidity. Accounts are at variance, however, as to this characteristic of the booby, some representing it as singular in not taking alarm nor becoming more wary even when it has had reason to apprehend danger from man; while others, as Audubon, assert that it does learn to be upon its guard, and even becomes difficult to approach. It feeds upon fish, and the expansibility of the gullet enables it to swallow those of considerable size. The booby is found on almost all tropical and subtropical shores, and sometimes even 200 miles from land. On the east coast of North America it reaches as far north as Cape Hatteras, but is much more abundant farther south. The flesh of the booby, which is sometimes eaten by sailors, is dark-colored, and not very agreeable.

BOOBY ISLAND, a level rock in Torres Strait, off Cape York, northern Australia, in lat. 10° 36′ S. and long. 141° 53′ E., three feet above high water, and one fourth mile in diameter. Being dangerous to navigators, and destitute of resources of its own, it is regularly supplied with provisions and water, for the benefit of shipwrecked sailors, by passing vessels.

BOOK-LICE, various small insects which damage books. In the family *Psocidæ*, in the order *Orthoptera*, there are numerous minute wingless insects, which shelter in books and among papers, and do especial damage to collections of insects. (See INSECTS, Vol. XIII, p. 152.) One of them (*Atropus pulsatorius*), erroneously credited with being the deathwatch, is very destructive to old books, especially in damp places, and to collections of dried plants, etc. The closely allied *Troctes divinatorius* is a yet commoner pest of entomological cabinets. Among beetles, too, in the wood-boring family (*Xylophaga*), *Ptilinus pectinicornuis* is known to attack books with wood in the binding.

BOOK OF CONCORD OR LIBER CONCORDIÆ. See LUTHERANS, Vol. XV, p. 84.

BOOKPLATES, the English name for a label bearing a name, crest, monogram, or other design placed in a book to indicate its ownership, place in a library, etc. The use of bookplates is of some antiquity, and mention has been made of one dated in the middle of the fifteenth century, but at present the fine bookplates of Bilibaldus Pirckheimer, which were designed by Albert Dürer, hold the foremost place in point of time. The earliest English engraved bookplate known is that of Sir Nicholas Bacon, father of Lord Chancellor Bacon, which is dated 1574. Many distinguished artists have con-

descended to produce bookplates. Hogarth engraved a bookplate for John Holland, heraldic artist, and another for George Lambert, the scene-painter. Of English engravers, William Marshal and Robert White may be especially mentioned. The collection of *ex libris*, as bookplates are technically called, has become of late years a popular pursuit for wealthy persons.

BOOK–SCORPION (*Chelifer cancroides*), a small dark brown arachnid belonging to the false-scorpions (*Pseudoscorpii*). It often is found in houses, especially among old books, where it preys upon small insects and arachnids. It has been seen in several parts of the United States. See *Chelifer*, under ARACHNIDA, Vol. II, p. 282.

BOOM, city of the province of Antwerp, northern Belgium, on the river Rupel, 10 miles S. of Antwerp, with good railroad connections and trading facilities, also on the Brussels canal. It has a gymnasium, extensive brick and tile works, tanneries, ropewalks, and sail-cloth factories. Population in 1890, 14,080.

BOONE, a city, and the capital of Boone County, central Iowa, two miles from the Des Moines River, on the Chicago and Northwestern and the Des Moines, Northern and Western railroads, about 40 miles N.W. of Des Moines. It is an important shipping-point for coal, immense quantities of which are mined in the vicinity. Good water-power is supplied by the river. It has extensive brick and tile works, four flour-mills, foundries and machine-shops, and the car-shops of the Chicago and North-Western railroad. Population 1890, 6,520; 1805, 8,345.

BOONE, DANIEL, pioneer; was born in Bucks County, Pennsylvania, Feb. 11, 1735; died in Charette, Missouri, Sept. 26, 1820. His grandfather, George Boone, emigrated from Bradninch, near Exeter, in Devonshire, England, to Bucks County, Pennsylvania, where he joined the Society of Friends, and his father, Squire Boone, removed to Holman's Ford, on the Yadkin, South Carolina, about 1748. Inspired by John Finlay's accounts of the wilds of what is now Kentucky, Daniel Boone set out to explore that country, with a party of six, May 1, 1769. He was captured by Indians, but escaped twice, and returned to his home in March, 1771. In 1773 he started for Kentucky with six families, including his own, and erected a fort at Boonesboro, where he settled with his family. In December, 1777, he went on an expedition to the celebrated Blue Licks to procure salt for the garrison, but on his return he was captured by the Indians. He and his party were taken to Detroit. His men were given to the British commander, but Boone was retained, and adopted into the family of Blackfish, a Shawanese chief. He discovered that the Indians, who treated him kindly, intended to attack Boonesboro, and he resolved to warn his comrades. He was chased by the Indians, but reached the fort, after a journey of 160 miles, in four days, during which time he had but one meal. Then, with but 50 men under him, he repulsed the attack of 500 Indians, after a siege of unparalleled hardships. He was rewarded with a major's commission from Virginia. In 1778 he went to North Carolina, and brought back his family to Boonesboro, where he became lieutenant-colonel of Lincoln County, one of the three divisions of Kentucky territory. Excited by the increasing number of the whites, the Indians attacked the settlements, and on Aug. 19, 1782, Boone fought a battle with 400 Indians at Blue Licks, where one of his sons was killed. In 1790 he settled at Point Pleasant, on the Kanawha River, now in West Virginia. In 1795 he removed to Missouri, then a Spanish possession, and from 1795 till 1804 lived in the Femme Osage district, of which he was made commandant, and received a grant of 8,000 acres. He lost this after the United States acquired the land through Napoleon, who had obtained possession of the Spanish grant. Appeal to the legislature of Kentucky and to Congress confirmed his title to a tract of 850 acres, in consideration of his public services. An original portrait of him by Chester Harding (1820) is in the State House of Kentucky. John Filson wrote an account of Boone's adventures as related by himself (1784), reprinted in Finlay's *Description of the Western Territory* (1793).



DANIEL BOONE.

BOONESBORO, a village of Madison County, east-central Kentucky, situated on the Kentucky River, about 20 miles S.E. of Lexington. Daniel Boone here erected and successfully defended, in 1775, the first fort built in Kentucky.

BOON ISLAND, an island off the coast of York County, southern Maine, 10 miles E. of York Harbor, in lat. 43° 7′ 16″ N., long. 70° 28′ 16″ W. It has a granite lighthouse, showing a fixed white light of the second order, 133 feet above sea-level.

BOONSBORO, Washington County, Maryland. See SOUTH MOUNTAIN, BATTLE OF, in these Supplements.

BOONTON, an important manufacturing town of Morris County, northern New Jersey, situated on the Rockaway River, and on the Delaware, Lackawanna and Western railroad, about 15 miles W. of Paterson. Its iron-works are among the most extensive in America. Besides blast-furnaces, rolling-mills, plate-mills, nail-mills and nut-mills, there are manufactories of hats and of flour, and a thriving trade in general merchandise. Population 1890, 2,981; 1895, 3,276.

BOONVILLE, a town and the capital of Warrick County, southwestern Indiana, on the Louisville, Evansville and St. Louis railroad; 28 miles E. of Evansville; is a farming and grazing district. It has tobacco factories, and coal is mined extensively in the vicinity. Timber is also plentiful. Population 1890, 1,881.

BOONVILLE, a city of central Missouri, the capital of Cooper County, and a river port, situated on the right bank of the Missouri River, about 200 miles W. of St. Louis. It stands on a bluff about

100 feet above the river. Coal, iron, lead, marble and lime are found in the vicinity. The city contains important manufactories of iron, earthenware, wine and textile fabrics. It is the seat of the Cooper Female Institute, and of the Kemper School for Boys. It was the scene of a battle fought June 17, 1861, in which a Confederate force under Colonel Marmaduke was routed by the Union troops under General Lyon. Population 1890, 4,141.

BOONVILLE, a village of Oneida County, central New York, about 25 miles E. of Rome, on the Black River canal and the Rome, Watertown and Ogdensburg railroad. It contains manufactories of lumber, leather, cheese, churns, gloves and chairs. Population 1890, 1,613.

BOORDE OR BORDE, ANDREW, physician, author, and eccentric, was born about 1490, near Cuckfield, in Sussex, England, and brought up under the stern discipline of the Carthusian order. About 1528 he succeeded in getting a dispensation from his vow, and subsequently studied medicine at Orleans, Toulouse and Wittenberg. On his return to England he was patronized by Cromwell, and afterward traveled in his service on a confidential mission through parts of France and Spain. The year 1536 he spent in the study and practice of medicine in Glasgow. Afterward he traveled by Antwerp, Cologne, Venice and Rhodes to Jerusalem. After his return he lived in London and Winchester, where his flagrant immoralities brought him to the Fleet prison in London. Boorde's chief works are his *Dyetary* and the *Fyrst Boke of the Introduction of Knowledge*, edited by Dr. Furnival for the Early English Text Society in 1870. His *Itinerary of Europe* has perished, but the *Hand-book of Europe* survives, and the *Itinerary of England, or Peregrination of Doctor Boorde*, was printed by Hearne in 1735. The earliest known specimen of the gipsy language occurs in the Introduction.

BOORHANPOOR OR BURHANPOOR. See BURHÁNPUR, Vol. IV, p. 536. Its population in 1890 was about 30,000.

BOOTES, in Greek mythology, the son of Demeter and Jason, who, being plundered of all his possessions by his brother, invented the plow and cultivated the soil. He was translated to heaven under the name of Boötes ("ox-driver"), which is still borne by a constellation beside the Great Bear. It is supposed to represent a man holding a crook and driving the bear. The bright star Arcturus is in Boötes.

BOOTH, BALLINGTON. See SALVATION ARMY, in these Supplements; also BOOTH, WILLIAM.

BOOTH, EDWIN THOMAS, American tragedian, son of the actor Junius Brutus Booth (q.v., in these Supplements), was born at Bel Air, Maryland, Nov. 13, 1833. Died in New York City, June 7, 1893. His education was desultory, and at an early age his father took him upon his professional trips as dresser and attendant. During one of these Edwin made his first regular appearance on the stage. This was at Boston, in 1849. His father did not approve of the son's choice of profession, but did not oppose him. In 1851 his father was ill in New York City, and the son took his part as Richard III. In 1852 Edwin Booth left his father and traveled about, going to Australia and the Sandwich Islands, experiencing many privations. Returning through California to the Eastern states, he played as a star in many cities. He performed then the great feat of playing *Hamlet* for 100 consecutive nights (Nov. 21, 1864, to March 25, 1865). He became manager of the Winter Garden Theater, New York (1862–67), and brought out magnificent productions of Shakespeare's greatest works.



EDWIN BOOTH.

In 1869 Booth's Theater was dedicated; it was run by him for 13 years, but did not prove a financial success, and after it was torn down he was obliged to earn another fortune to pay off the financial obligations incurred by this venture. Lawrence Barrett, Edwin L. Davenport, J. W. Wallack, Jr., Joseph Jefferson, Charlotte Cushman and Modjeska were among the stars that appeared in Booth's Theater.

Edwin Booth likewise made trips to Germany and England, and in his later years he made starring tours in company with Lawrence Barrett, through the principal cities of the United States. He was married, July 7, 1860, to Miss Mary Devlin of Troy, who died in Dorchester, Massachusetts, Feb. 21, 1863, leaving a daughter, Edwina, a year old. In 1869 Booth was again married, the lady being Miss Mary Runnion McVicker. In 1892 his health had become so poor as to compel retirement from the stage.

As the name of his father became associated with the character *Richard III*, so that of Edwin Booth is inseparably connected with *Hamlet*, in which character he displayed a refined interpretation, a depth of feeling, and a subordination of personality never excelled.

BOOTH, JOHN WILKES, actor, was born in 1838, in Harford County, Maryland. From his father, Junius Brutus Booth, he inherited a touch of insanity, which rendered his life erratic. His name has been rendered infamous by his assassination of President Lincoln. Upon the 26th of April, 1865, near Bowling Green, Virginia, he was shot by Sergeant Boston Corbett while resisting arrest. See LINCOLN, Vol. XIV, p. 661.

BOOTH, JUNIUS BRUTUS, actor, was born in London, England, May 1, 1796; died upon a Mississippi River steamboat, Nov. 3, 1852. The son of a barrister, he received a good education, studied various departments of art, and was commissioned as a midshipman in the British navy. After several trials as an amateur actor, he made, contrary to his father's wishes, an engagement to play subordinate parts at the theater in Peckham, and in 1814 appeared as a member of an English company of comedians traveling through Holland and Belgium. On February 18, 1817, he made his *début* at Covent Garden Theatre, London, where, as Richard III, he appeared several times with great success. In January, 1821,

Booth married Miss Holmes, and during their wedding tour the couple landed at Norfolk, Virginia, June 30, 1821. A week later, Booth appeared at the Richmond Theater. This was followed by engagements in other cities. At that time he entertained the chimerical notion of becoming a lighthouse-keeper. On October 5th, he made his first appearance in New York City, at the Park Theater. In 1822 he bought and improved a wild tract of land about 25 miles from Baltimore, which remained his retreat during life, when he was not professionally engaged. In 1825 he again visited London. On his return to America, he opened at the Park Theater, New York, March 24, 1827. In September, 1831, he performed in New York City in connection with Forrest. Soon afterwards the death of two of his children impaired his reason, but he recovered and continued his usual performances. During the last 10 years of his life he spent much time on his farm, making occasional visits to Boston, New York and New Orleans, and often capriciously playing in out-of-the-way places. In 1852 he went to California, and from there visited New Orleans, where he played a week's engagement. During his passage homeward he became sick from exposure, and died for lack of medical care.

BOOTH, MARY LOUISE, author and editor, was born at Yaphank, on Long Island, New York, April 19, 1831; died in New York City, March 5, 1889. She was of French descent; taught school with her father in Williamsburg, but gave it up on account of ill health, and adopted literary work, sending sketches to the newspapers and translating French stories. During the war she engaged in translating the writings of De Gasparin, Laboulaye and Cochin, Frenchmen sympathetic with the cause of the Union. Her patriotic work received the praise of President Lincoln and other statesmen. She translated the *History of France*, by Henri Martin, and wrote a *History of the City of New York*. In 1867 *Harper's Bazar* was established, and Miss Booth was its editor until her death.

BOOTH, WILLIAM, founder and commander of the Salvation Army, was born in Nottingham, England, April 10, 1829. Having been privately educated at his home, he was ordained, at the age of 21, a minister of the Methodist New Connection. In 1861 he resolved to sever all his denominational ties, and to devote himself wholly to evangelistic work among the degraded classes of London. Having attracted considerable attention to his work and received financial aid from several philanthropists, he established, in July, 1865, the Christian Mission in the East End of London. No small credit for the success of the enterprise is due Mrs. William Booth. Since 1878 this organization has been known as the Salvation Army, whose influence has become world-wide, and whose mainspring and controlling power he has continued to be, directing its movements, at home and abroad, from his headquarters in London. General Booth has written several hymns, and in 1891 published his *Darkest England and the Way Out*, a work which created a profound impression by its revelations of the vice and destitution that prevail in some large cities, chiefly London. He likewise formulated plans for their abatement, which were so well received that a subscription fund of over a million dollars was placed in his hands, and, through the Salvation Army, used for the establishment of farm, city and over-the-sea industrial colonies for the poorest classes of the city slums. His sons and daughters, whose devotion and executive ability are no less than their father's, hold positions of high rank in the Army, the eldest son being chief of the staff, and the eldest daughter identified with the work in France. The American division of the Salvation Army, until 1896 under the command of Ballington Booth, was twice visited by General Booth, and his more recent visit was soon followed by the recall of Ballington Booth and a consequent split in the forces of the American division. See SALVATION ARMY, in these Supplements.



GENERAL BOOTH.

BOOTHBAY HARBOR, town and summer resort in Lincoln County, in the central part of the coast of Maine. It is at the mouth of the Damariscotta River, and 13 miles S.E. of Bath. There are several manufacturing concerns in the town, which possesses a good harbor and has frequent steamboat communication with the towns along the coast. Boothbay Harbor is a popular resort, the handsome scenery and fine bathing attracting many visitors each summer. Population 1890, 1,699.

BOOTS, coverings for the feet, mostly of leather, which have been important in dress since the costumes of mediæval times. The boots worn by the knights of Europe were often elaborately decorated, and in some cases gave evidence of the rank of the wearer, as did the colored footgear of the politicians of Rome. In Rome, too, the cothurnus, a high and very thick-soled boot, was worn by hunters and tragedians. The picturesque wide-topped high boots of Spanish leather, which formed an essential part of the costume of the European gentlemen of the seventeenth century, and was much worn on military service, finally gave way to the less cumbersome spurred jack-boot, which is still in service in the English cavalry. The more usual modern military boots, however, styled "Wellingtons," are close-fitting and do not extend above the knee. The machine construction of modern footwear has caused a great diminution in the manufacture of boots, whose form does not permit machine-stitching. In consequence, boots, save the flexible water-proof ones, have largely fallen into disuse. See SHOEMAKING, Vol. XXI, pp. 830, 831; and in these Supplements.

BOPPARD, a town of Rhenish Prussia, on the left bank of the Rhine, 10 miles S. of Coblenz. It is the site of the ancient Bandobriga of the Romans, and the ruins of a Roman encampment are still here. It was afterwards an imperial city till 1312, and the seat of a diet in 1234. It is now a thriving town,

with two fine Gothic churches, a seminary for females, and factories for making woolens and yarns. Population, about 5,000.

BORA, KATHARINA VON, the wife of Luther, born of an old family in the district of Meissen, Jan. 29, 1499; died at Torgau, Dec. 20, 1552. At a very early age she entered a Cistercian convent of Nimptschen, near Grimma. Her marriage with Luther took place June 13, 1525. She bore her husband three sons and three daughters, and is best described in Luther's own words as "a pious, faithful wife, on whom a husband's heart could rely." See LUTHER, Vol. XV, p. 79.

BORACIC ACID OR BORIC ACID. See BORAX, Vol. IV, p. 50.

BORAGE, the popular name of a genus, *Borago*, of the family *Boraginaceæ*, to which family it has given its name, although one of the smallest representatives of it. The family name, *Asperifoliceæ*, is now coming into more common use. Borago has a beautiful blue wheel-shaped corolla; for which it is sometimes cultivated, but with coarse, rough stem and leaves. The common species is *B. officinalis* of Europe, which was formerly much cultivated and highly esteemed, being classed among the *cordial* flowers, and supposed to possess exhilarating qualities for which it no longer receives credit. It was frequently put in wine, and, although it has no sensible properties, its traditional virtues still retain for its leaves a place in the preparation of claret-cup. The young leaves and tender tops are pickled, and occasionally boiled for the table, and are still used in salads in Germany.

BORCHGREVINK, CARSTEN EGEBERG, Antarctic explorer, was born in Christiania, Norway, in 1864. His father, observing his roving disposition and love for the sea, sent him on a voyage "before the mast." This but increased his fondness for exploration and adventure, and, after graduation from Gjerston College, Norway, and several years' scientific study in Dresden, he went to Australia, where he became connected with the Forestry Department of Queensland. At this time he made the perilous ascent of Mount Lindsay, being the first to achieve this feat. In the fall of 1894 he accompanied the whaler *Antarctic* upon an exploration of southern polar regions as the representative of the Royal Geographical Society of Victoria. Before undertaking his sledge journey toward the southern pole, he traveled and lectured in the United States.

BORDEN, GAIL, inventor, was born at Norwich, New York, Nov. 6, 1801; died at Borden, Texas, Jan. 11, 1874. While on a survey expedition his attention was called to the need of suitable foods for emigrants, and he began a series of experiments. He produced "pemmican," a kind of meat biscuit which was carried by Dr. Kane in his Arctic expeditions. In 1856 he secured a patent for his method of condensing milk, and afterward produced beef extract, condensed tea, coffee and cocoa, as well as condensed fruit juices. His milk-condensing establishments brought him much wealth. See MILK, Vol. XVI, p. 304.

BORDENTOWN, a city of New Jersey, situated on the Delaware River, about 6 miles below Trenton and 30 N.E. of Philadelphia. It was founded in 1717, and is noted as having been the residence of Francis Hopkinson, signer of the Declaration of Independence, Joseph Hopkinson, Admiral Charles Stewart, Joseph Bonaparte and Prince Murat. The Bonaparte mansion is still standing. Bordentown is the seat of Bordentown Female College, and of a military institute, and contains a number of important manufactories, including iron, machinery, shirts and ship-building. It is conveniently connected with Trenton and Philadelphia by both boat and rail. Population 1890, 4,232.

BORDER, THE, a term denoting the tract of country lying immediately on both sides of the frontier line between England and Scotland, and somewhat elastic in its signification. Geographically, the frontier line runs diagonally northeast and southwest, between the head of the Solway Firth at the latter extremity, and a point a little north of the mouth of the Tweed at the other extremity; the counties touching upon this line being Cumberland and Northumberland on the English side, and Dumfries, Roxburgh and Berwick on the Scottish side. The distance between the two extremities is nearly 70 miles as the crow flies, but following the frontier line in its irregularities, about 110 miles.

While the above may be taken as defining the Border in a geographical sense, the word has for historical purposes a wider signification, especially on the Scottish side. The territory thus indicated on the Scottish Border includes the whole of the counties of Berwick, Roxburgh, Selkirk and Peebles, a considerable portion of Dumfriesshire, and part of Galloway. Although the name of the Border, or Borders, is perhaps not older than the thirteenth century, it is of interest to note that from the very dawn of British history the district so called has exhibited in its annals the characteristics of a frontier, in that it has almost constantly formed the point of contact between contending races and nations.

The Border has been the scene of some great historical battles. To narrate all the invasions that took place on either side of the Border would be to repeat much of the general history of England and Scotland. From the eleventh down to the seventeenth century battle followed battle. Most famous of the forays of the border was Chevy Chase; q.v., in these Supplements.

There is yet a third and more popular sense in which the word *Border* is used. This, which may be called the literary sense of the term, arises out of the prominence which has been given to the vale of the Tweed, including its tributaries the Yarrow, the Ettrick and the Teviot, by the romances and poems of Sir Walter Scott, by the poetry of Leyden and of the Ettrick Shepherd, by the ancient and traditional ballads relating to the district, and by the pathetic songs and legends more immediately connected with the Yarrow, and glorified by the genius of Wordsworth. Hence Border tales and Border ballads have to do with the Scottish, rather than the English, side of the frontier. Save the ruins of old castles, whose scarred walls bear silent witness of the warfare once waged about them, nothing stands now

upon the English or Scottish confines to indicate the existence of the historic Border.

BORDIGHERA, a winter resort in the Riviera, northern Italy, on a hill overlooking the Mediterranean, seven miles S.W. of San Remo by rail. It was founded in 1470, but its modern progress dates from the opening of the Corniche road in 1823, and of railway communication. Bordighera suffered in the earthquakes of February, 1887. Population, 2,600.

BORDONE, PARIS, a painter of the Venetian school; born of noble parentage at Treviso, Italy, in 1500; died at Venice in 1570. He studied under Titian and under Giorgione, and in 1538 was invited to France by Francis I, who employed him to paint portraits of himself and of leading members of his court. He was knighted by Francis II. His most important ecclesiastical work in painting was the six sacred subjects with which he decorated the dome of San Vicenzo, Treviso; and his *Fisherman Presenting the Ring of St. Mark to the Doge*, now in the Academy, Venice, is ranked as a masterpiêce among his easel-pictures. He is represented in the National Gallery, London, by *Daphnis and Chloe*, and *A Portrait of a Genoese Lady*.

BORE, a tidal phenomenon at the estuaries of certain rivers, also called *Eagre*. See GEOLOGY, Vol. X, p. 283.

The most celebrated bores are those of the Ganges (see HOOGHLY, Vol. XII, p. 147), Indus and Brahmaputra (q.v., Vol. IV, p. 211). The last is said to rise to a height of 12 feet. In the Amazon and other rivers in Brazil the bore reaches a height of from 12 to 16 feet. In England the phenomenon is most noticeable in the Severn, Trent and the Wye, and in the Solway Firth, where it is known as the eagre or eager. The bores in the Bay of Fundy are very remarkable. On the Amazon this phenomenon is called the *prororoca;* on the Seine, the *barre*, and on the Garonne and Dordogne, in France, the *mascaret*.

BORERS, a popular name given to the larvæ of many widely different insects, which by eating form small tunnels in wood. The pupa stage is passed in the hole, and after metamorphosis the perfect insect emerges. The peach-tree, grape-root, currant and other borers are larvæ of certain moths (*Lepidoptera*). Many borers are larvæ of beetles (*Coleoptera*). Still others are larvæ of certain flies (*Diptera*). See COLEOPTERA, Vol. VI, p. 132.

BORGALLE TUNNEL, an Italian railway tunnel on the Parma and La Spezzia line. It is 5 miles long, 20 feet high, and 25 feet wide, and accommodates a double line of rails. Its cost was about $8,000,000.

BORGHESI, BARTOLOMEO, COUNT, antiquary, founder of the modern science of Roman epigraphy, was born on the 11th of June, 1781, at Savigrano, Italy; died in San Marino, April 6, 1860. His epigraphical works are a standard authority upon matters pertaining to the political and military institutions of ancient Rome. His rich collection of coins afforded material for much of his research. His works have been published by the French government.

BORGNE, LAKE, a large inlet into the eastern coast of Louisiana, 12 miles east of New Orleans, 28 miles long and 17 wide. Steamers plying between New Orleans and Mobile traverse this lake by the Mississippi River and Lake Borgne canal.

BORLAND, SOLON, United States Senator, and brigadier-general in the Confederate army. From Virginia, the state of his birth, he early traveled to the Southwest and settled in Little Rock, Arkansas, where he became a practicing physician. After gallant service in the Mexican War, he was sent, in 1849, to the United States Senate by the state of his adoption. From 1853 to 1854 he was minister to Nicaragua, and also represented American interests in Costa Rica, Guatemala, Salvador, and Honduras. An attack upon the person of Senator Borland in Greytown, Nicaragua, on account of his alleged assistance in the escape of an accused murderer, led to the bombardment and destruction of that town by the United States sloop-of-war *Cyane*, July 13, 1854. He was active in the organization of the Confederate forces from Arkansas, and attained the rank of brigadier-general in that service. He died in Texas, Jan, 31, 1864.

BORN, BERTRAN DE, foremost of French soldier-troubadours, was born in Perigord in 1140. Henry Curtmantle, the son of Henry II of England, was his patron, and the struggles of Henry furnished the themes of his poems of arms. With his sword he fought, and with his *Sirventeses* he sang, and both brought him fame in the conflict between Henry II and his rebel sons. In his poems of love, the force and passion of his war poetry is not found. His pictures of the struggles and political conditions of the twelfth century are of historical value. Dante celebrates De Born as the great poet of arms of the middle ages. He died about 1215, in the monastery in which his declining years were spent. His influence in the bloody struggles of the sons of Henry, and upon the conflicts between Philippe Auguste and Richard the Lion-Hearted, had been remarkable.

See *The Historic Rôle of Bertrand de Born* (L. Clédot, 1878) and *Bertrand de Born, Complete Poems* (A. Thomas, 1888). See Vol. XIX, p. 875.

BORNEIL, GUIRAUT DE, called the "Master of the Troubadours," a poet of Provence, ranked by Dante, along with Arnaut, Daniel and Bertran de Born, the greatest of their compeers. Borneil has left poems of charming simplicity, and remarkable productions in the so-called "close" style. His poems had a more moral tone than those of his contemporaries, and are marked by sacred reverence for the art of poetry and chivalry, which are his themes. His chief work was done between A.D. 1175 and 1220. See *Lives and Works of the Troubadours* (F. Diez, Leipsic, 1829 and 1882).

BORNEO, the largest island in the Indian Archipelago. For full description and map, see BORNEO, Vol. IV, pp. 55–60.

The history of Borneo records no time in which the island formed a political unity. Since 1733 the Dutch government has controlled the larger part of Borneo, and its rights are undisputed, save in British North Borneo, and in that part of the island under the rule of the Sultan of Sulu. The formation of the British North Borneo Company in 1881 marks an

epoch in the history of the island. Through grants by the sultans of Sulu and Bruner, the company obtained jurisdiction over 31,106 square miles of territory, having a coast-line over 900 miles in length. On the 12th of May, 1888, the British government formally declared a protectorate over the state of North Borneo. In the same year, the neighboring territories upon the northwest coast, Brunei and Sarawak, were placed under British protection. Commercial stations have been established throughout this territory and the neglected native resources of the region developed. The state has 180,000 inhabitants, many of whom are Mohammedan settlers and immigrants from China. The native population is not large, but cannot be accurately estimated. The chief town and seat of the governor is Sandakan, on the east coast. About 1,000,000 acres, upon which coffee and tobacco are grown, are the property of the British government. The exports of British North Borneo amount to $1,700,000 annually; the imports to $1,350,000. A branch of the cable between Labuan and Singapore has been laid to Borneo. Coins and legal-tender notes are issued by the government, whose currency is based upon a dollar unit.

Sarawak, formally under British control since 1888, covers 50,000 square miles of territory, and contains Kuching and Sibou, populous towns. The former is upon the Sarawak River, 23 miles from its mouth. The exports are similar to those of North Borneo, and have an annual value of $3,000,000. The import and coasting trade is slightly greater.

Brunei, nominally controlled by a sultan, contains but 3,000 square miles. The town of Brunei, situated upon a river of the same name, and about 20 miles from the coast, is the old capital of Borneo, where the sultan reigned with absolute authority. It has a population of 20,000.

The Dutch possessions have a total area of 212,000 square miles and a population of about 1,250,000. They are divided into two residences, that of the west coast, and that of the south and east districts. Pontianak (9,000) is the capital of the former, Banjermassin (30,000) of the latter. Special reservations of territory have been made for occupation by the native tribes, who have been largely driven from the coast by the Malays, about 300,000 of whom are settled along the coast. The Dutch possessions have developed but slowly, and few internal improvements of importance have been made.

The island of Labuan, off the cost of Brunei, has been under the control of the British North Borneo Company since 1889. See *Handbook to British North Borneo* (London, 1890), and *About Ceylon and Borneo* (Clutterbuck, 1891).

BORNEO CAMPHOR. See CAMPHOR, Vol. IV, p. 761.

BORO-BUDUR OR BÂRÁ-BUDUR, a remarkable Buddhist temple. See JAVA, Vol. XIII, pp. 608, 609.

BORODINO, a small village of Russia, in the government of Moscow. It stands upon the river Kologa, and is 75 miles S.W. of the city of Moscow. It is famed for the dearly bought victory which the troops of Napoleon won here in the Russian campaign of 1812. See NAPOLEON, Vol. XVII, p. 217.

BOROGLYCERIDE, a compound prepared by heating together 62 parts of boric acid and 92 parts of glycerin. It is extensively used as a preservative of food, and also in antiseptic surgery, combining, as it does, the valuable properties of the above-mentioned substances.

BORON. See CHEMISTRY, Vol. V, p. 520.

BORROW, GEORGE HENRY, author and linguist, was born at East Dereham, Norfolk, England, July 17, 1803. At Norwich young Borrow attended the grammar school (1815–18), and for the next five years was articled to a firm of solicitors. He already deserved his gipsy title, *Lavengro* ("word-master"), having picked up a knowledge of Irish, French, German, Danish, Welsh, Latin, Greek, and of Romany, the language of the gipsies. For many years he yielded to his love of nature and of adventure, and rambled gipsy-wise about England. Subsequently, as agent of the Bible Society, he visited St. Petersburg (1833), and Portugal, Spain, Morocco (1835–39). In 1840 he married and settled down on a small estate at Oulton, near Lowestoft, where, after travels in southeastern Europe (1844), a tour of Wales (1854), and a residence of some years in London, he ended his days, July 30, 1881.

The chief of his 14 published works are *The Zincali, or Gypsies of Spain* (1840); *The Bible in Spain* (1843); *Lavengro* (1851); its sequel, *The Romany Rye* (1857); *Wild Wales* (1862); and *Romano Lavo-Lil, or Word-book of the English Gypsy Language* (1874). He has been likened to Cervantes, Defoe, and Le Sage. In truth, all three were in some ways his literary progenitors; none the less, he is always original, always George Borrow. His rare mastery of good, strong English, his rarer power of depicting mankind and nature, are, however, often marred by mannerisms, transparent mystifications, and unreasoning crotchets.

BOSBOOM, JOHANNES, Dutch painter, was born in The Hague, Feb. 18, 1817. His artistic training was obtained in the studio of Van Brée, where he turned his attention to architectural painting. His *Views in the Church at Alkmaar* and his *Cathedral at Rotterdam* are typical of his work. He won gold medals at the expositions of 1878 and 1889. He is a chevalier both of the Order of the Lion of the Netherlands and the Order of Leopold.

BOSCHBOK, a name usually applied to a South African antelope (*Tragelaphus sylvaicus*). The name *bush-buck* refers to its habit of living in dense thickets. The name is also applied to other antelopes of the same region.

BOSCHVARK, the bush-pig or wild hog of South Africa (*Potmochœrus Africanus*). In color it is dull red with white marks.

BOSIO, FRANÇOIS JOSEPH, BARON, sculptor, was born at Monaco, March 19, 1769; died in Paris, July 29, 1845. He studied art, first in Paris, afterwards in Italy, and won fame through the figures which, at the request of Napoleon, he executed for the column in the Place Vendôme. For the same patron he made busts of Josephine and of Hortense, her daughter. Louis XVIII and Charles X also

patronized Bosio; the former made him royal sculptor, the latter a baron. At the time of his death he was director of the Academy of Fine Arts in Paris. His *Hyacinth* and *Nymph Salmacis* are sculptures whose grace and refined beauty are remarkable. See also SCULPTURE, Vol. XXI, p. 564.

BOSJESMANS. See BUSHMEN, Vol. IV, pp. 575, 576.

BOSNIA AND HERZEGOVINA, provinces of Austro-Hungary. Total area, 23,262 square miles. Population, 1,500,000. For early history, see BOSNIA, Vol. IV, p. 68: and HERZEGOVINA, Vol. XI, pp. 775, 777.

By the treaty of Berlin, July 13, 1878, these provinces were transferred from Ottoman control to that of the Austro-Hungarian government. The present governmental administration is conducted by a Bosnian bureau at Vienna in the name of the Emperor-King. The chief authority in the province itself, with its seat in Sarajevo, is the provincial government (Landesregierung), in three departments,—for internal affairs, finance and justice. For administrative purposes there are 6 districts (Kreis) and 48 county (Bezirk) authorities. The provincial government is provided with an advising body, composed of the ecclesiastical dignitaries of Sarajevo and 12 representatives of the populace. Similar councils are also provided for the district and county authorities. The Sanjak of Novi-Bazar is occupied by an Austrian military force, though administered civilly by Turkey. In religion, about two fifths of the population are Mohammedans, a slightly larger number Oriental Christians, some 300,000 Catholics, and about 8,000 Jews. The chief nationality in Bosnia and Herzegovina is Servian; only in the southern districts are Arnauts, and here and there gipsies. The most populous towns are the capital, Sarajevo, 38,000; Mostar, 14,500; and Banjaluka, 14,000. In the budget of 1895 the revenues and expenditures were a little over $6,000,000.

Agriculture is in a very low state of development, though the soil is very fertile. Maize, wheat, barley, oats, rye, millet, buckwheat, potatoes, flax, hemp and tobacco are cultivated. Both provinces have a superabundance of fruit, principally plums. Dried plums are the chief article of export. Cattle-grazing is important. Forest land occupies 45 per cent of the entire area. Minerals are abundant; mining is now carried on for iron, copper, manganese, chromium and antimony. The principal mines are in Bosnia. There are salt-pits at Dolnja-Tuzla.

Bosnia and Herzegovina belong to the Austro-Hungarian custom territory. In 1895 there were 471 miles of railway and 1,513 miles of telegraph lines.

Military service is compulsory for males over 20 years of age.

BOSPHORUS OR BOSPORUS CIMMERIAN, an ancient name for the Strait of Yenikale, or Kaffa. See AZOFF, SEA OF, Vol. III, p. 169.

BOSQUET, PIERRE FRANÇOIS JOSEPH, general and marshal of France, was born Nov. 8, 1810, at Mont-de-Marsan, in Landes; died Feb. 5, 1861. He entered the Algerian army in 1834, and reached the rank of general of brigade in 1848. During the Crimean war he contributed greatly to the victories of Alma and Inkermann, and took a leading part in the capture of the Malakoff, where he was severely wounded. In 1856 he was made a senator and field-marshal of France.

BOSS, LEWIS, astronomer, was born Oct. 26, 1846, in Providence, Rhode Island. His fame chiefly depends upon a comprehensive catalogue of the declinations of 500 of the fixed stars, which he prepared while astronomer of the United States northern boundry commission, and which won for its author recognition throughout the astronomical fraternity. In 1876 he became director of the Dudley Observatory in Albany, New York. Mr. Boss, in 1882, was sent by the government to Santiago, Chile, as chief of a party appointed to observe from that point the transit of Venus. He is an honorary foreign associate of the Royal Astronomical Society.

BOST, JEAN AUGUSTIN, Protestant theologian of Switzerland and France, was born in Geneva, July 3, 1815, and died there, July 29, 1890. In the Reformed Church of France he served as pastor at Bourges, at Rheims, at Sedan and at Chartres. He published many writings, historical and concerning theological controversy. Among them are *Ancient and Modern History of the Church of the Brothers of Bohemia and of Moravia; General History of the Establishment of Christianity;* and *The Epoch of the Maccabees.*

BOSSUT, CHARLES, mathematician, was born at Tartaras, near Lyons, France, Aug. 11, 1730; died in Paris, Jan. 14, 1814. From 1752 until the revolution of 1793 he was professor at Mezières, and, under the empire, was connected with the polytechnic schools in Paris. He became a recognized authority upon mechanics and dynamics, and his *Complete Course of Mathematics* is a standard work. In the compulsory retirement that followed the Revolution he wrote his famous *Essai sur l'Historie Générale des Mathematiques.*

BOSTAN, EL, town in Asiatic Turkey. See ALBISTAN, in these Supplements.

BOSTEA OR BUZRAH. See BOZRAH, Vol. IV. p. 186.

BOSTON, the capital and largest city of Massachusetts. (See Vol. IV, pp. 72–77, for description and history down to 1880.) Since that time there have been included within the limits of the city East Boston (Noddle's Island), Charlestown, South Boston, Roxbury, Dorchester, West Roxbury, and Brighton. The city thus extends over 24,000 acres. Newton, Cambridge, Somerville and Chelsea are immediate suburbs.

*Public Buildings.* Foremost in importance among the late additions to the public edifices of the city is the new building for the Boston Public Library (q.v., in these Supplements). *Trinity Church*, the third Protestant Episcopal Church in Boston, is probably the most remarkable example of church architecture in America. It is of the French Romanesque style, and is considered the masterpiece of the great architect Richardson. The cost of Trinity was $750,000. *The Cathedral of the Holy Cross*, in 1896 the largest

Catholic church in New England, is a magnificent stone structure at the corner of Washington and Malden Streets. *New Old South Church* is a costly and imposing edifice, one of the striking features of Copley Square. In 1890 the *Museum of Fine Arts* was remodeled at a cost of more than $250,000. Its museum collection ranks among the greatest in the world. The educational institutions within the limits of Boston are numerous and handsomely housed. Boston University, Harvard Medical School and the Massachusetts Institute of Technology are prominent among these. The medical school occupies a magnificent new building near the new library. Bowdoin Square and Castle Square theaters and the Columbia are the largest theaters of the city, and occupy imposing buildings. The Peabody Museum is an institution of great interest, which occupies a large building erected by George Peabody, its founder. It has been the chief agent in the investigation of American archæology and ethnology.



FANEUIL HALL, BOSTON.

*Parks.* The public park system forms an almost unbroken chain from Craigie's Bridge, at the north end of the city, to City Point, South Boston. The beauty and accessibility of the parks and pleasure-grounds of Boston are unexcelled among American cities. In the city and suburbs there are 14,000 acres devoted to park purposes. The commissioners have expended $12,000,000 in their improvement. Charlesbank, The Fens, Leverett Park, Jamaica Park, the Arnold Arboretum, Franklin Park, and the Common are the most important features of this great system. The embankments and boulevards along the Charles River form one of the greatest beauties of the city. The formation of an enlarged park system, to extend throughout the bordering suburbs, and to completely encircle the city, is an enterprise of recent undertaking. Among the many beautiful residence streets of the city, Commonwealth Avenue is without a peer. It is one of the handsomest boulevards in the world.

*Public Education.* The first free schools in America were established in Boston about 250 years ago, where now the system of public schools is very elaborate and complete. The Boston Latin School, preparatory for college, was founded in 1635. The building for the New English High and Latin School is one of the largest in America devoted to educational purposes. Boston University (q.v., in these Supplements) includes three colleges, four professional schools and a post-graduate department of universal science. There is also the Boston University School of Medicine, open for both sexes; Boston College (Roman Catholic); Tufts College (Universalist); Massachusetts Institute of Technology; and Lowell Institute, which provides for annual courses of free lectures upon the most important branches of natural and moral science.

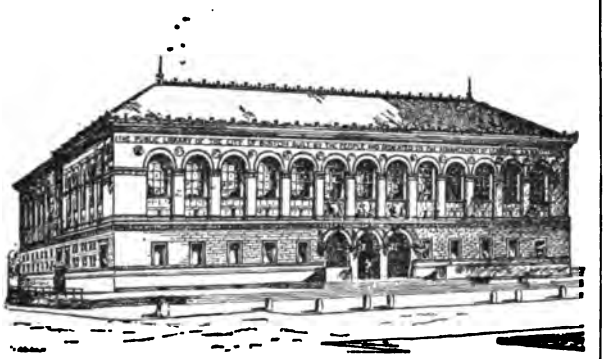
*Transportation Facilities.* Boston is the first city in the United States to establish a subway system of transportation between various urban centers. Contracts for the construction of this system were let in the spring of 1895, and it was announced that all electric surface-cars in the busy part of the city were to be depressed beneath the level of the streets. It was stipulated in the contracts that the double-track tunnels should be 24 feet wide and 14 high; the four-track to be simply double tunnels having columns down the center. Subways have been built under the most congested quarters, and the overcrowding of her narrow streets, a problem more serious for Boston, on account of her crooked and narrow thoroughfares, than for any other American city, has been greatly relieved. A thorough system of surface-cars gives easy access to the numerous suburbs. Boston is a terminus for several great lines of railway. The union station, with a frontage of 367 feet on Causeway Street, is one of the largest in the world. The main entrance is under a magnificent archway. The lines of Sound steamers between Boston and New York are famous for the elegance of their vessels and the convenient connection which they afford between the two great cities of the seaboard. Eight transatlantic steamer lines have docks in Boston harbor.

*Commerce and Industry.* There are 8,000 separate industries in Boston, with an aggregate capital of $120,000,000, and with 95,000 employees; value of the annual product, $225,000,000. Boston has commercial relations with all parts of the globe, and is one of the chief ports of entry in the United States. Population 1880, 362,839; 1890, 448,477; 1895, 496,920.

BOSTON PUBLIC LIBRARY, the oldest of the free libraries of America supported by general taxation. It was founded in 1852, and its growth and development since that date have been rapid and sure. In 1880 there were more than 300,000 volumes in the library, and the need of more commodious and convenient accommodation for this immense collection was keenly felt. The old building, which stood on Boylston Street, opposite the Common, was poorly protected from fire, and permitted no further extension. The commonwealth, with characteristic public spirit and liberality, granted a desirable site for the erection of a new building. This, and an additional purchase by the city of adjacent land, is now occupied by the new

building of the Boston Public Library, the most beautiful library structure in the world, one of the noblest public edifices in America. It stands in the place of honor on Copley Square, the most important square in the city of Boston. In 1887 the trustees of the library selected Mr. Charles F. McKim of New York City to be the architect of the proposed structure, now a monumental evidence of its designer's master-art. Upon the 28th of November, 1888, the corner-stone was laid, and seven years later, in March, 1895, the building was opened to the public, having been completed at a cost of $2,368,000. The board of trustees consisted of Mr. Samuel A. B. Abbott, Mr. Henry W. Haynes, Mr. Phineas Pierce, Mr. Frederick O. Prince, and Mr. William R. Richards.

The Bibliothèque Ste. Geneviève in Paris was the immediate model of the library, whose architecture is accordingly in the style of the Renaissance. Itself purely classic, it is surrounded by a group of buildings of the picturesque and modern fashion. Emphasis of its severe, yet graceful, lines results. The library is 225 feet long and 227 deep. Its height from the sidewalk to the cornice is 70 feet. Massachusetts granite is the chief building-material, three



BOSTON PUBLIC LIBRARY.

façades having been erected of this beautiful stone. The fourth, of brick, admits further extension. The main entrance faces the east and overlooks Copley Square. It forms the central feature of a façade of extraordinary beauty, whose rusticated masonry, magnificent arcade, and rich cornice is overtopped by a purple tiled roof. The three great arched doorways of this entrance are flanked by groups of statuary of heroic size, done by Mr. Augustus St. Gaudens, whose brother, Mr. Louis St. Gaudens, designed the huge marble lions of the grand staircase. Below the three window arches over this entrance Mr. St. Gaudens has sculptured the seals of the library, the city and the commonwealth.

The interior has been richly adorned throughout by the foremost exponents of modern decorative art. The mural paintings, whose rich beauty has made their authors famous, form the interior feature of chief interest. The names of Mr. Abbey and Mr. Sargent are borne by the more important of these achievements. The broad entrance hall leads to the grand staircase, which is largely built of the yellow marble of Siena, Italy. Upon the floor above, to which this stairway carries the visitor, are the main apartments of the library. Bates Hall is the chief of these. Three hundred readers may be amply accommodated here, and the books desired are brought from the delivery-room by attendants.

Of the library proper, little need be said. This magnificent collection of books, accumulated by the city for nearly half a century, significant of its intellectual life, is the most important of American libraries. The number of volumes contained is 600,000, and a force of 150 persons is constantly employed in their care, and in making them, by the most modern methods, easy of access for the reading public. See also BOSTON, Vol. IV, p. 76.

BOSTON UNIVERSITY, an institution of higher education in Boston, Massachusetts. In 1869 it was chartered by the legislature of the state. The number of students in attendance reaches a total of 1,100, and there are 120 instructors. Boston University offers a large number of advanced courses, which, though a collegiate degree is not a prerequisite for admission, are attended mostly by graduate students, and of these the total attendance is largely made up. The colleges of liberal arts and of agriculture are the undergraduate departments of the University. The schools of law, theology and medicine are the graduate professional departments. The Massachusetts Agricultural College at Amherst forms the agricultural department. The School of all Sciences offers various courses in language, philosophy and science, primarily for graduate students. The institution is governed by a council consisting of the president and the deans of the various departments. A board of trustees, constituting the corporation, controls in the interests of the University property, valued at one million five hundred thousand dollars.

BOSWELLIA is the generic name of the "incense tree" of tropical Africa, Arabia and India, belonging to the *Burseraceæ*, a family, many of whose genera yield fragrant gums. The product of *Boswellia* ("olibanum") is believed to be the frankincense of antiquity, and is still largely used in the preparation of incense, especially the product of *B. Carteri*. Other resins, such as "elemi," often referred to *Boswellia*, are from allied genera, notably *Protium* and *Elaphrium*. See FRANKINCENSE, Vol. IX, p. 708.

BOSWORTH OR MARKET BOSWORTH, an English market town in Leicestershire, southwest of Leicester. It was on a moor two miles south of Bosworth that the battle was fought (1485) in which Richard III was slain, and which terminated the Wars of the Roses. On an elevation called Crown Hill, Lord Stanley placed the crown on the head of the Earl of Richmond, Henry VII. Simpson, the mathematician, was a native of Bosworth, and Dr. Johnson served there as an usher in the grammar school. Population of parish, 14,000.

BOSWORTH, JOSEPH, an Anglo-Saxon scholar; born in Derbyshire in 1789; died May 27, 1876. Presented in 1817 to the vicarage of Little Horwood, Buckinghamshire, he devoted his time largely to researches in Anglo-Saxon. The result of his labors appeared in his *Elements of Anglo-Saxon Language* (1838), a new edition of which, by Professor Toller, was issued in 1883. Bosworth became,

in 1858, professor of Anglo-Saxon at the University of Oxford.

BOTALLACK, a noted mine on the west coast of Cornwall, eight miles north of Land's End. The works are on the edge of the cliff; part of the underground workings (abandoned in 1875), extended 2,448 feet out under the sea. This, and the splendid coast scenery, attracts many tourists. The mine was worked as a tin-mine in 1721, and in 1841 was famous as a very rich copper-mine. It has since been worked for one or both of those metals.

BOTANIC GARDENS, gardens devoted to the culture of plants for the promotion of botanical science. Like the science itself, the botanic garden owes its birth to the needs of pharmacy; thus at the earliest European school of medicine, that of Salerno, there is record, in 1309, of the medical garden of Matthæus Sylvaticus, while in 1333 a similar garden was established by the republic of Venice. (See BOTANY, Vol. IV, p. 80.) At Paris a royal garden was founded in 1597, but it was not until 1626 that its scientific purposes were defined. In 1635 chairs of botany and pharmacology were founded, and it soon became famous as the Jardin des Plantes, which covers 75 acres. The establishment of gardens continued during the seventeenth century, and those of Oxford (1683), Chelsea (1677) and Edinburgh (1670) may be particularly noted. The famous British gardens at Kew, founded in 1730, covering 75 acres, with an adjoining arboretum of 270 acres, as well as those at Ghent (1797), and Hamburg (1813), are among the best now existing.

A further impetus was given by the popularization of botany in the last century by Linnæus, and by the consequently increased importance of the subject as a branch of academic education; most European universities, including all German ones, have now their botanic gardens. The leading American universities and cities have followed suit, the gardens of the United States Agricultural Department at Washington, the Missouri Botanical Gardens at St. Louis, and the Arnold Arboretum at Brookline, in connection with Harvard College, being especially well known.

The mode of arrangement of botanic gardens varies infinitely in detail. The Linnæan system has been replaced by the natural, but in their mode of expressing this no two gardens agree; in some the principle of arranging plants according to their geographical distribution is also largely followed, while economic or medical interests have had a variable share.

BOTETOURT, NORBORNE BERKELEY, LORD, born in England about 1734; died in Williamsburg, Va., Oct. 15, 1770. In 1761 he was colonel of militia, and became a peer in 1764. In July, 1768, he became governor of Virginia, succeeding Mr. Jeffrey Amherst. In November, 1768, he arrived on the James River. In May, 1769, the Virginia assembly complained of Parliamentary taxation, and of sending accused persons to England for trial; in reply, Lord Botetourt dissolved the legislature, of which Thomas Jefferson was then a leader. On the next day the people met in convention at the Raleigh tavern, and passed resolutions against the use of any merchandise imported from Great Britain. These resolutions were sent to England and to the other colonies. Lord Botetourt's efforts of conciliation prevented further difficulty. Failing, however, to secure the repeal of the obnoxious laws, he demanded his recall, which was at once complied with by the government. His death followed shortly after.

BOTFLY, a pale yellowish fly (*Gastrophilus equi*) which lays its eggs upon the hair of the horse. (See VETERINARY SCIENCE, Vol. XXIV, p. 205.) The name is also applied to the sheepsbot, which lays its eggs in the nose of the sheep.

BOTHRICEPHALUS, a genus of tape-worms, formerly confounded with *Tænia*. Two species infect man (*B. latus* and *B. cordatus*). The latter occurs in Greenland. See TAPE-WORM, Vol. XXIII, p. 54.

BOTOCUDOS, the most barbarous of the Indian tribes of Brazil, inhabiting the east coast range, between the Rio Pardo and the Rio Doce. Their name is derived from the Portuguese *botoque* ("bung-hole"), with reference to their under lip, which is pierced to hold a disk of wood. They are of middle height, sturdily built, and have small hands and feet; their features are strongly marked, with broad cheek-bones and repulsively thick lips and nose, redeemed by white, regular teeth and sparkling black eyes. They generally go quite naked, have no fixed settlements, and their food includes anything not absolutely poisonous. Their speech is entirely distinct from that of the other Indian nations; they have no religion, properly speaking, but are abjectly afraid of spirits, and pay a certain worship to the moon as creator of the world. Through systematically cruel treatment they have been almost annihilated, and now number not more than 4,000.

BO TREE (*Ficus religiosa*), or the pippul tree of India. The sacred bo tree near Anarajapoora is believed to be the oldest tree in the world. It is said to have been planted 288 B.C. as a branch of the tree under which Sakyamuni sat when he became Buddha. The main stem of this tree was broken off by a storm in October, 1887. The severed portion was solemnly cremated with religious rites. See FIG, Vol. IX, p. 154.

BOTRYCHIUM, a genus of the family *Ophioglossaceæ*, one of the families of ferns. The ordinary ferns produce their sporangia (spore-cases) on the under surface of ordinary foliage leaves, but in *Botrychium* (as in all *Ophioglossaceæ*) the leaf divides into two prominent branches, one of which serves the purpose of foliage, and the other bears the sporangia. This cluster of globular sporangia has been likened to a cluster of small grapes, whence the generic name. The sporangia further differ from the ordinary ones in having no elastic ring (*annulus*), but open by a slit. In *Ophioglossum*, an allied genus, the foliage branch and sporangium branch are undivided; while in *Botrychium* they are pinnate. *B. Virginanum* is the most widely distributed species, occurring in both hemispheres. Among the popular names are "grape-fern," "moonwort," "rattlesnake-fern."

BOTRYTIS, a large genus of what are known as the "imperfect fungi." The species attack many

plants in a weakened condition, and are also found upon dead plants, being included among the numerous fungus forms known as "mildews." *Botrytis* probably represents but one phase in the life-history of certain polymorphous forms. *B. Bassiana*, which produces the disease of silkworms known as "muscardine," is probably but the conidial form of *Cordyceps*. *B. cinerea*, another common parasite, is probably the conidial form of *Sclerotinia fuckeliana*, etc. Many species formerly included in *Botrytis* have already been referred to species of *Peronospora*.

BOTTA, PAUL ÉMILE, archæologist and traveler, a son of Carlo Botta (q.v., Vol. IV, p. 164), was born in Turin, Italy, Dec. 2, 1802. After extensive travels in the New World and in Egypt he became, in 1833, French consul in Alexandria, and thence undertaking a journey to Arabia, published the results in his *Relation d'un Voyage dans l'Yemen* (1841). He was soon after appointed consular agent at Mosul, and in that region made a series of discoveries which form an epoch in archæological science, his most important discovery being that of the palace of Sargon, king of Assyria. In 1848 he published *Mémoires de l'Écriture Cuneiforme Assyrienne*, and *Inscriptions Découvertes à Khorsabad*. In 1846 M. Botta was appointed consul-general at Jerusalem, and in 1857 at Tripoli. He returned to France in 1868, and died at Achères, March 29, 1870.

BOTTA, VINCENZO, Italian philosopher and historian; born near Turin on the 11th of November, 1818. After holding a professorship of philosophy at Cuneo and in Turin, he traveled in Germany and in the United States, making an inspection of the educational systems of those countries. Among his works are *Dante as Philosopher, Patriot, and Poet; Life of Cavour;* and *History of Modern Italian Philosophy*. In 1853 he became professor of Italian literature in the University of the City of New York. He died Oct. 5, 1894.

BOTTALLA, PAUL, Jesuit priest and Italian historian; born in Palermo, Sicily, Aug. 15, 1823. Having been educated in the Jesuit colleges at Palermo and in Rome, he entered the orders, and became successively professor of universal history in Massimo College at Palermo, of ecclesiastical history in the Roman College, of theology in the University of Bruno, and of theology and history at the University at Poitiers. He published *Historical Studies upon the Church of the Empire; Course in the General History and Geography of the Middle Age; History of the Revolution of 1860 in Sicily;* and *The Pope and the Church Considered in their Mutual Relations*.

BOTTESINI, GIOVANNI, composer and contrabassist; born at Crema, in Lombardy, Dec. 24, 1823. At an early age he was admitted to the Milan Conservatory, where he undertook the double-bass as a solo instrument. Upon a concert tour with Arditti in 1840, extending to America, he established fame as the greatest living master of the double-bass. From 1846 he was director of Italian opera in Havana, Paris, Palermo and Barcelona, and in 1864 began a series of compositions which included four operas and an oratorio. His *Méthode Complète de Contre-Basse* is a standard work, and his oratorio *Garden of Olivet* is highly esteemed. He died in 1889.

BÖTTGER, JOHANN FRIEDRICH, a discoverer of porcelain manufacture, was born in Reuss-Schleiz in 1682 or 1685; died March 13, 1719. The celebrated Meissen porcelain-works owe their origin to him. See POTTERY AND PORCELAIN, Vol. XIX, p. 639.

BOTTLE-BRUSH, a name applied to various plants with close spicate inflorescences which suggest a swab, or bottle-brush. For example: *Dipsacus*, the common teasel; *Callistemon, Metrosideros*, etc., of the *Myrtaceæ; Equisetum*, the scouring-rushes, or horse-tails; *Hippuris*, the common aquatic mare's-tail; *Asprella*, a common grass of the United States, etc.

BOTTLE-CHART, a marine chart which purports to show the track of sealed bottles thrown into the sea and washed upon the beach or picked up by other ships. Lieutenant Becher, an English naval officer, constructed, in 1843, a chart of bottle-voyages in the Atlantic, so as to illustrate the currents. The bottle-chart has from time to time been re-edited and republished. A bottle-chart of the Great Lakes has been made by the United States government.

BOTTLE-GOURD OR CALABASH (*Lagenaria vulgaris*), of the family *Cucurbitaceæ*, a native of India, but now common almost everywhere in warm climates. (See GOURD, Vol. XI, p. 4.) The bottle-gourd is grown in some parts of the United States. Another species (*Lagenaria idololatrica*) is a sacred plant of the Hindoos, much employed in their religious ceremonies.

BOTTLEHEAD (*Hyperoödon*), one of the toothed whales in the same family as the sperm *Physeteridæ*, less correctly but more properly known as *bottlenose*. See WHALE, Vol. XXIV, pp. 525, 528.

BOTTOMLEY, JAMES THOMSON, chemist and physicist, was born at Fortbreda, County Down, Ireland, Jan. 10, 1845. He was sent to Trinity College, Dublin, to prepare for the ministry, but his natural preference for physics and chemistry led him to choose a scientific career early in his undergraduate course. After a year's residence in Glasgow, subsequent to his graduation from Trinity, Mr. Bottomley was appointed demonstrator in chemistry in King's College, London. Injury to his health led to his transfer a year later to be demonstrator in natural philosophy. In 1870 he became connected with the University of Glasgow. He is the author of a textbook on *Dynamics* and one on *Hydrostatics*, and has been a frequent contributor to scientific periodicals.

BOTTOMRY, a contract in the nature of a mortgage, by which the owner of a ship, or the master as his agent, borrows money for the purpose of paying the expenses incurred in the course of her voyage, which he undertakes to repay if the voyage is successfully terminated. The contract of bottomry is usually in the form of a bond, but may be in the form of a bill of sale, and is enforceable in a court of admiralty. The lien of a bottomry bond has preference over prior common-law or statutory liens. It holds good, if diligence is exercised in enforcing it, against purchasers, but, like most admiralty liens, will be lost by unreasonable delay in enforcing it, if the rights of purchasers or encumbrancers have

subsequently intervened. As between two holders of bottomry bonds on the same vessel in respect to different voyages, the later lien is usually entitled to priority out of the funds derived from the sale of the vessel. But the wages of seamen for the voyage upon which the bottomry is found, or any subsequent voyage, constitute a prior lien to that of the bottomry bond, although if the bondholder shall be required to discharge such liens in order to make his own lien good, he will have a personal action for the amount so paid against the ship owner in case he fails to realize sufficient from the sale of the ship to discharge his bottomry claim and that of the seamen. By act of Congress in the United States, bottomry bonds and other hypothecations are void against all persons without actual notice thereof, other than the obligor, his heirs and devisees, unless recorded in the office of the collector of customs where such vessel is registered or enrolled. But this act expressly provides that any lien by bottomry which might be created against the vessel during her voyage for a loan necessary to make repairs or enable her to complete her voyage shall not lose its priority or in any way be impaired by reason of its not being recorded according to the provisions of that act. See BOTTOMRY, Vol. IV, pp. 167, 168.

BOTTS, JOHN MINOR, statesman; born in Dumfries, Prince William County, Virginia, Sept. 16, 1802; died in Culpeper, Virginia, Jan. 7, 1869. He was admitted to the bar at the age of 18; was sent to the state legislature, and thence to Congress (1839). During the Civil War he retired to his farm at Culpeper Courthouse. After the war Mr. Botts published a volume entitled *The Great Rebellion: Its Secret History, Rise, Progress and Disastrous Failure.* He was a delegate to the Philadelphia national convention of Southern loyalists, and later signed his name to the bail bond of Jefferson Davis.

BOTUSCHANI, a town of Moldavia, northern Rumania, on the Shiska, 62 miles northwest of Jassy, at the terminus of a branch railway; has an active trade, especially with Germany, in wine, cattle, wool, honey, wax and tobacco. Population, 39,941; 63 per cent of whom are Jews.

BOUCHÉ-LECLERCQ, AUGUSTE, French writer upon historical and literary subjects, was born at Francières, Oise, in 1841. After many years spent in study and authorship, and travel in France, Italy and Germany, he was chosen professor of ancient literature at Montpellier, France. In 1879 he became a member of the faculty of the University of Paris. Chief among his writings are *Giacomo Leopardi: His Life and Works; History of Divination in Antiquity;* and *History of Greece under the Roman Domination.*

BOUCHER DE CRÈVECŒUR DE PERTHES, JACQUES, archæologist and author; born at Réthel, France, Sept. 10, 1788; died at Abbeville, Aug. 5, 1868. Having come to the notice of Napoleon through his father's influence, he was employed in various state missions in Italy, Germany, Austria and Hungary. After the Restoration, he settled at Abbeville, where he resided until his death. He wrote extensively and variously, but his fame depends solely upon his investigations in the archæology of man, a subject then in its infancy. He was a patient and thorough investigator. *The Creation; Antediluvian Man and his Works;* and *Celtic and Antediluvian Antiquities*, are his most important contributions. See ANTHROPOLOGY, Vol. II, p. 115.

BOUCICAULT, DION, British actor and playwright, was born in Dublin, Ireland, Dec. 26, 1822; died in New York City, Sept. 18, 1890. He was educated at London University, and in 1841 his first successful play, *London Assurance*, written in conjunction with John Brougham, was presented at the Covent Garden Theatre. From 1853 to 1860 he lectured and took part in dramatic representations in the United States. Soon after his return to England in 1860, his still famous *Colleen Bawn* was presented at the Adelphi, and this was followed by a rapid succession of plays whose popularity and clever workmanship remain unquestioned. In 1874 he returned to the United States, where he afterward resided. He had charge of the New York Metropolitan and other theaters, but was best known as a playwright. *The Shaughraun; The Octoroon; The Relief of Lucknow; The Streets of London; Rip Van Winkle; The Parish Clerk; How She Loves Him; Lost at Sea; Janet's Pride; Faust and Marguerite*, and many others, are noteworthy for their bright dialogue, humor, pathos and dramatic action. Irish scenes and Irish characters were his favorites. He was among the first of modern writers to make dramatic writing remunerative.



DION BOUCICAULT.

BOUDINOT, ELIAS, American statesman and philanthrophist, was born in Philadelphia, May 2, 1740; died in Burlington, New Jersey, Oct. 24, 1821. He practiced at the bar of New Jersey, and in the Revolutionary war became commissary-general of prisoners. He was chosen a delegate to Congress from New Jersey in 1777, and served until 1779, and again from 1781 until 1784, and from 1789 to 1795. On Nov. 4, 1782, he was chosen president of Congress, and as such signed the treaty of peace with Great Britain. In 1795 he was appointed director of the mint in Philadelphia, retaining this office until July, 1805. His declining years were spent in Burlington. He was a trustee of Princeton College, and in 1805 endowed it with a cabinet of natural history. He was the first president of the American Bible Society, and gave it $10,000. Among his bequests was one of 13,000 acres of land to the corporation of Philadelphia for the purpose of supplying fuel at low prices to the poor. He published several books, notably his *Age of Revelation*, a reply to Thomas Paine, and *The Star of the West*, an attempt to identify the lost tribes of Israel with the American Indian.

BOUGH, SAMUEL, landscape-painter; born at Carlisle, England, Jan. 8, 1822. He was a self-taught artist, and in 1845 obtained a position as

a scene-painter in Manchester, and later in Glasgow, where he was persuaded to devote his attention to landscape-painting. Among the more important of his oil pictures are *Edinburgh from the Canal* (1862); *Holy Island* (1863); *In the Trossachs* (1865); *The Vale of Leith* (1866); *Kirkwall Harbor* (1867); *Borrowdale; St. Monance;* and *Royal Volunteer Review* (1860). A collection of over 200 of his paintings is in the Glasgow Institute. Bough settled in Edinburgh in 1855, where he died, Nov. 19, 1878.

BOUGHTON, GEORGE HENRY, American artist, was born in Norfolk, England, in 1836. Three years later the family removed to Albany, New York. In 1853 he went to London for study, and made a sketching tour through England. On his return he settled in New York, where he soon became recognized as a landscape-painter of great promise. In 1860 he went to France, where he spent two years in study and then moved to London. Mr. Boughton depicts Puritan life with much felicity and delicacy. Noteworthy among his best-known pictures are *The Scarlet Letter; Return of the Mayflower; Puritans Going to Church; Rose Standish; Canterbury Pilgrims;* and *Edict of William the Testy*, the last being in the Corcoran Gallery in Washington. His exhibition at the World's Columbian Exposition was greatly admired. In 1896 Mr. Boughton was elected a member of the Royal Academy, a vacancy having been made by the death of Lord Leighton.

BOUGIES, slender cylinders, smooth and flexible, used for distending mucous canals, as the gullet, bowels or urethra, in cases of stricture or diseases of those parts. For the urethra, they are frequently of German silver or pewter, and vary from one sixteenth to one fourth of an inch in diameter, though even larger sizes are sometimes used by surgeons. For the other canals they are usually made of plaited thread impregnated with a substance called gum elastic, of which the chief constituent is India rubber, and vary in diameter from one eighth of an inch to two inches or more. The name is also applied to rods of similar shape made of gelatin, cacao-butter, or some such substance, which melts at the temperature of the body, and contains any medicaments which it is desired to apply to the mucous membrane of the urethra or the nasal cavities.

BOUGUEREAU, ADOLPHE WILLIAM, French artist, born at La Rochelle, France, Nov. 30, 1825. He worked under Picot and in the École des Beaux-Arts, in Paris, where, in 1850, he gained the *Grand Prix de Rome*, which entitled him to study in Italy. He first attracted attention by *The Body of St. Cecilia borne to the Catacombs* (1854), which, with his *Philomela and Procne* (1861), is now in the Luxembourg. Among his other works may be named *The Bather; Vow of St. Anne; Harvest Time; The Mower; Holy Family; Triumph of Venus; Alma Parens.* Many of his works are in the United States, and have become well known through frequent reproduction. His *Nymphs and Satyrs* is in the Hoffman House, New York City. The high rank which the best paintings by M. Bouguereau give this artist may not be disputed, although his mediocre productions have led to much criticism.

BOUILLE, FRANÇOIS CLAUDE AMOUR, MARQUIS DE, French general; born at the castle of Cluzel, in Auvergne, in 1739; died in London, Nov. 14, 1800. At the age of 14 he entered the army, and served with distinction in Germany during the Seven Years' War, and in 1768 was appointed governor of the island of Guadeloupe, and afterward commander-in-chief of all the French forces in the West Indies. When war broke out in 1778, he took successively, from the British, Dominica, Tobago, St. Eustache, Saba, St. Martin, St. Christopher's and Nevis. He was nominated by Louis XVI, in 1787–88, as a member of the Assembly of Notables, and in 1790 he was made commander-in-chief of the army of the Meuse, the Saar and the Moselle. For his share in the attempted escape of Louis XVI he was obliged to flee from France, and in 1791 entered the service of Gustavus III of Sweden, and afterwards served in the corps of the Prince of Condé. He subsequently went to England, where his advice in West Indian affairs was useful to the government, and where he wrote *Mémoires sur la Révolution Française.*

BOUILLIER, FRANCISQUE, historian and philosopher; born in Lyons, France, July 12, 1813. He completed his studies at the College of Lyons, and took a doctor's degree in 1839. Two years later he was chosen a member of the faculty of Lyons, whose dean he became in 1848. He was appointed inspector-general in 1865 and retired in 1879. Of his numerous writings may be mentioned *Critical History of Cartesianism; Concerning Conscience in Psychology and in Morals;* and *Religion within the Limits of Reason.* He was made an officer of the Legion of Honor in 1867.

BOULAC, BOULAK OR BOULAQUE. See BULAK, in these Supplements.

BOULANGER, GEORGES ERNEST JEAN MARIE, French general and politician, was born at Rennes, April 29, 1837. He was educated at St. Cyr; was appointed a lieutenant in the Algerian tirailleurs, and served in Algeria, Italy and Cochin China. He was with Bazaine at Metz, but escaped to Paris, and held a lieutenant-colonelcy under the Government of National Defense. In 1876 he headed the deputation of French officers at the celebration of the centenary of American independence; become brigadier-general in 1880, through the influence of Duc d'Aumale, and in 1884–85 commanded the army of occupation in Tunis, until an arbitrary attempt to exalt the military over the civil authority led to his recall. Boulanger was Minister of War from January, 1886, to May, 1887, and urged forward the expulsion of the Duc d'Aumale and the other princes from France, and, through the introduction of some desirable army reforms and the appearance of various popular music-hall songs in his praise, he was adopted as the embodiment of the "revenge" policy by the Parisians, who for some months suffered from what was termed the "Boulanger fever." The support given him by all malcontents, whose idol he became, returned him by an overwhelming majority to the Chamber of Deputies in 1888, the year in which he had been deprived of his military command on account of disobedience. In the same year he was severely wounded in a duel with Prime Minister Floquet, who had challenged him during a

violent dispute in the Chamber. Charges of misappropriation of funds and violation of parole caused his flight to England. After his subsequent trial, he, already a fugitive, was formally exiled. His re-election to the Chamber in 1889 was annulled. A man of remarkable energy and personality, he was for a time the most conspicuous and turbulent character in French politics. He committed suicide, Sept. 30, 1891, upon the grave of Mme. de Bonnemain, who had been his mistress.

BOULANGER, GUSTAV RODOLPH CLARENCE, French artist; born in Paris, April 25, 1824; died there, Sept. 21, 1888. After several years' study in the famous studios of his native city, he went to Italy and undertook the reproduction of classical Roman scenes. For these, and for his nude figures, he is best known. His paintings have been favorites for reproduction. He was one of the decorators of the foyer of the Grand Opera House in Paris, whose mural paintings have great fame. Among his best achievements are *Hercules; Summer Bath at Pompeii; Repast at the House of Lucullus;* and *Appian Way*, the last being in the Stewart Collection in New York City.

BOULDER, an important city of north-central Colorado, the capital of Boulder County, situated on both sides of Boulder Creek, 5,835 feet above sea-level, near the east base of the Rocky Mountains, about 25 miles N.W. of Denver, on the Union Pacific railroad. It represents interests of immense wealth in gold and silver mines, in coal-mines and in agriculture and stock-raising. Iron, lime and building-stone are also abundant. The orchards in the vicinity are among the largest and most fruitful in the state. Among the principal manufactories of the city are flouring-mills, iron foundries, and smelting and sampling works. The altitude of Boulder is 5,184 feet; its climate is delightful, and its proximity to the famous Boulder Cañon, and to numerous medicinal springs, has made it an attractive resort for tourists and invalids. It is the seat of the University of Colorado. Population 1892, 4,500.

BOULDER-CLAY, a stiff, tenacious clay, which has a very wide geographical distribution. It has been traced over vast regions in British America and the Northern states of the Union, and overspreads extensive areas of Europe. It varies in thickness from a few feet up to 20 or 30 yards. (See GEOLOGY, Vol. X, p. 367). Boulder-clay is known in Scotland as *till*—a term which many geologists prefer, inasmuch as boulder-clay is often rather a stony earth than a clay. It was also formerly designated as *diluvium* and *drift*.

BOULDERS OR BOWLDERS, ERRATIC, large masses of rock found at a distance from the formations to which they belong. The term is generally applied to detached masses found lying on the surface. These boulders or fragments of rocks appear to have been transported from their original sites by ice in the Pleistocene period. The *erratics* of America extend as far south as 40°, but on the old continent do not occur much beyond latitude 50°.

BOULDER VALLEY, a town and the capital of Jefferson County, southwestern central Montana, situated in a mining district, about 28 miles S. of Helena, on the Great Northern and Northern Pacific railroads. The population, engaged chiefly in gold and silver mining, numbers 922.

BOULE OR BOULLE WORK. See BUHL-WORK, Vol. IV, p. 446.

BOULEVARD, a French name given to a street or promenade planted with rows of trees. Originally it was applied to the bulwarks portion of a Norman style of fortification; then to the promenade laid out on a demolished fortification. The boulevards of Paris are the most famous. They form a series of broad drives and shaded promenades, whose magnificent beauty is unrivaled. The so-called outer boulevards date from 1786, and were also old fortifications leveled and planted. The name is now commonly extended to any street or walk encircling a town, and also to a wide, shaded street of park-like appearance from which heavy traffic is excluded.

BOULOGNE, a suburb of Paris, in the department of the Seine, situated on the right bank of the river of that name, and about five miles S.W. of Paris, from which it is separated by the Bois de Boulogne. The river is here crossed by a fine stone bridge of 12 arches. All traces of the many injuries inflicted upon this suburb during the siege of 1870–71 have now disappeared. Population, 25,000.

BOUND OR BOUNDARY, the utmost limits of land by which the same is known and can be described. See BREHON LAW, Vol. IV, p. 254. For an account of the ancient Roman boundary stones, see INSCRIPTIONS, Vol. XIII, pp. 129, 130.

BOUND BROOK, a village of Somerset County, central northern New Jersey, pleasantly situated on the Raritan River, where the Delaware and Raritan canal joins it; about 30 miles W. of New York, on the Central Railroad of New Jersey, the Lehigh Valley and the Philadelphia and Reading railroads. It is an important railroad and manufacturing center, and the headquarters of an extensive trade in lumber. Population 1895, 2,030.

BOUNTY, money paid or a premium offered to promote or encourage the performance of certain acts, or the transaction of certain classes of business. The term is usually applied only to such rewards or offers as are made by the government. Thus the reward or premium offered to induce men to enlist as soldiers during the progress of a war is termed a bounty, also the reward frequently established by state legislatures for those who kill dangerous animals or noxious and destructive birds. Frequently a bounty is established by the state or national government for those who engage in a particular business or industry, which it is desired to encourage, as the fishery industry. A notable case of this class of bounty was that established upon the manufacture of sugar in 1890, in the revision of the tariff made by Congress in that year. This bounty remained in force for about four years, and was declared by the supreme court of the United States to be a constitutional measure. This bounty was fixed at two cents per pound, to be paid by the government of the United States to the sugar manufacturers for all sugar which should be manufactured in this

country, and tended very much to stimulate that industry and reduce the price of sugar to the consumer.

BOUNTY, MUTINY OF THE. See BLIGH, WILLIAM, Vol. III, p. 82; PITCAIRN'S ISLAND, Vol. XIX, p. 132.

BOUQUETIN (*Capra ibex*), a wild Alpine goat, now almost extinct. It was once common, and was often found as high as the perpetual snow-line. The names *stein-bok* and *ibex of the Alps* are sometimes used. See IBEX, Vol. XII, pp. 605, 606.

BOURBON, an educational and manufacturing town of Marshall County, central northern Indiana, pleasantly situated in a fertile agricultural region, about 50 miles W. of Fort Wayne, on the Pittsburg, Fort Wayne and Chicago railroad. It is the seat of Salem College. It contains important manufactories of flour, boots and shoes, carriages and furniture. The surrounding country is rich in oak, maple, poplar, beech, walnut and other valuable timber. Population 1890, 1,064.

BOURBONNAISE, a gently undulating terrace-formed district in the center of France, northward of the highlands of Auvergne, comprising the modern department of Allier and part of Cher, and abounding in grain, fruit, wine, iron, marble and mineral springs. From 1327 to 1523 it formed the duchy of Bourbon.

BOURBONNAIS GROVE, a post village of Kankakee County, northeastern Illinois, 2½ miles from Kankakee, the county capital. It is the seat of the College of St. Viateur, of a convent and of large Catholic schools. It has two churches. Population, 600.

BOURBOULE OR LA BOURBOULE, a bathing-resort in the French department of Puy-de-Dôme; q.v., Vol. XX, p. 120.

BOURDON, name given to the double diapason stop of the pipe-organ. See ORGAN, Vol. XVII, p. 830.

BOURGEOIS, LEON, French statesman; born in Paris, May 21, 1851. His public career began in 1882, when he was appointed prefect of the Tarn. A year later he became secretary-general of the prefecture of the Seine, and in 1885 prefect of the Haute-Garonne. He was appointed director of commercial affairs and prefect of police in 1887, and a year later was elected to the Chamber. In 1888 he became Under-Secretary of State, and in 1892 had risen to be Minister of Public Instruction. He was Minister of Justice under Ribot, upon whose retirement in October, 1895, he organized a radical ministry. Upon the 28th of March, 1896, he succeeded M. Berthelot as Minister for Foreign Affairs, having previously held the portfolio of Minister of the Interior. M. Bourgeois is a Republican Radical, representing Châlons-sur-Marne.

BOURGEOISIE, a French term denoting the middle classes of society, as distinguished from the nobility and the working-classes proper. It is often applied to the middle classes of any country, more particularly those engaged in trade. See SOCIALISM, Vol. XXII, p. 208.

BOURGET, LE, a village six miles N.E. of Paris by rail, which, during the siege of the capital in 1870, was the scene of a series of battles, disastrous to the French, of which the most important were those of October 30th and December 21st. The Lac-du-Bourget, the largest wholly French lake in the department of Savoie and the basin of the Rhone, lies 780 feet above sea-level. It has an area of 16 square miles.

BOURGET, PAUL, critic and novelist, was born at Amiens, France, Sept. 2, 1852. He was educated at the Lyceum of Clermont-Ferrand, where his father was professor of mathematics, and at the college of Sainte Barbe. His literary career began in 1873, but it was not until 10 years later that he displayed much ability. During this time he contributed numerous articles to the magazines, and published three volumes of verse. His *Essais* gave indication of marked ability. The second series, *Nouveaux Essais de Psychologie Contemporaine* (1886), was a subtile and searching inquiry into the causes of pessimism in contemporary France. Bourget's first novel, *L'Irréparable* (1884), was followed by *Cruelle Énigme* (1885); *Un Crime d'Amour* (1886); *André Cornelis* (1887); *Mensonges* (1887); *Le Disciple* (1889); *Cosmopolis* (1892); and *Outre-Mer* (1894). These works have placed him in the front rank of contemporary French novelists. On the 13th of June, 1895, he was admitted to the French Academy.



PAUL BOURGET.

BOURMONT, LOUIS AUGUST VICTOR, COMTE DE GHAISNE, French marshal, the conqueror of Algiers, was born Sept. 2, 1773, at Bourmont, in Anjou. He went into exile during the revolution, and from 1793 to 1799 was actively engaged in the anti-revolutionary struggle in Vendée. Subsequently his career was a vacillating one, at one time favoring the Bourbons, at another deserting their cause. He served in the Napoleonic campaigns of 1813–14, also in Algiers and in Portugal. He died on his estate in Anjou, Oct. 27, 1846.

BOURINOT, JOHN GEORGE, clerk of the Canadian House of Commons, and writer on the Constitution of the Canadian Dominion, was born at Sydney, Nova Scotia, Oct. 24, 1837. He was educated at Trinity College, Toronto, and for a time was editor of a journal in Halifax, N. S. In 1880 he became chief clerk of the House of Commons at Ottawa, and has been an extensive writer in English, American, and Canadian magazines. His published works are *Parliamentary Practice and Procedure* (1880); *Constitutional History of Canada* (1887); *Parliamentary Government in Canada* (1892); and *How We are Governed* (Toronto, 1895). In 1890 he was created a C.M.G. In 1896 appeared a *History of Canada*, in the "Story of the Nations" Series.

BOURNE, HUGH, founder of the Primitive Methodists, was born at Fordhays, parish of Stoke-upon-Trent, Staffordshire, England, April 3, 1772; died at Bemersley, Oct. 11, 1852. At first an assistant to his father, who was a farmer and wheelwright, when 27 years of age he became a preacher among the

Wesleyan Methodists. His method of conducting services and his zeal for open-air meetings were not approved by the leaders of the denomination, and in 1808 he was cut off from the Wesleyan connection. His preaching, however, was wonderfully acceptable to the public, and he soon gathered around him a large number of devoted adherents. In March, 1810, a committee of ten was formed at Standley, near Bemersley. This is regarded as the first move toward official organization of the body, which in 1812 adopted the name *Primitive Methodists*. The first chapel of the body was founded at Tunstall in 1811, by Bourne and his brother. For the greater part of his life he worked as a carpenter and builder, but found time to visit Scotland, Ireland and the United States. See METHODISM, Vol. XVI, p. 192.

BOURNONITE, a complex sulphid of lead, antimony and copper. See MINERALOGY, Vol. XVI, p. 395.

BOURO, one of the Malay Islands. See BURU, Vol. IV, pp. 572, 573.

BOURSEUL, ÉTIENNE CHARLES DÉSIRÉ, French inventor, was born in 1830, and received his education at the Royal College of Douai. He entered the telegraph service in 1852, and enthusiastically devoted himself to the study of that agent of communication, then in its infancy. M. Bourseul is entitled to credit as one of the inventors of the telephone, his zealous studies in the search for new applications of electrical energy leading him to certain conclusions concerning the transmission of the vibrations of the voice, which were set forth in an article published in Paris in 1854. (See TELEPHONE, Vol. XXIII, p. 128.) A commutator which bears his name is in general use, and he devoted several years of study to the development of a microphone. He retired from his high governmental position in the administration of telegraphy in 1886. In 1890 he was made an officer of the Legion of Honor.

BOUTELLE, CHARLES ADDISON, naval officer, journalist, and member of United States Congress, was born at Damariscotta, Maine, in 1839. He early adopted the profession of his father, a shipmaster, and on his return from a foreign voyage in the spring of 1862, volunteered and was appointed acting master in the United States navy. He served in the North and South Atlantic and West Gulf squadrons and was promoted to a lieutenancy "for gallant conduct in the engagement with the rebel ironclad *Albemarle*," May 5, 1864. Afterwards in command of the United States steamer *Nyanza*, he participated in the capture of Mobile. He was honorably discharged, Jan. 14, 1866, being at that time in command of the naval forces in the Mississippi Sound. In 1870 he became managing editor and in 1874 proprietor of the Bangor (Maine) *Whig and Courier*. He was elected Representative-at-Large to the Forty-eighth Congress in 1880, and was re-elected to the Forty-ninth, Fiftieth, Fifty-first, Fifty-second, Fifty-third and Fifty-fourth Congresses. As a member of the Fifty-first Congress and chairman of the Committee on Naval Affairs, he was the author of the bill providing for the first battleships of the new navy.

BOUTON, NATHANIEL, clergyman and historian, was born at Norwalk, Connecticut, June 29, 1797; died at Concord, New Hampshire, June 6, 1878. After his graduation from Yale and from Andover Theological Seminary, he was ordained the pastor of the First Congregational Church, Concord. In 1867, after 42 years' useful and honorable service to the state and her educational and religious institutions, he retired from his pastoral duties, and devoted himself to study and writing, receiving the honorable appointment of historian of the state. His historical writings include *History of Concord, New Hampshire; Collections of New Hampshire Historical Society* (vols. 7, 8); and 10 volumes of *Provincial Records*.

BOUTWELL, GEORGE SEWALL, statesman, was born in Brookline, Massachusetts, Jan. 28, 1818. After spending his youth on his father's farm, he became a merchant in Groton, where he remained till 1855. Here he studied law and pursued a course of reading to make up for lack of college training. In 1840 he entered politics. He was sent seven times to the legislature, was thrice defeated as candidate for Congress and once for governor. In 1851 and 1852 he was elected to the latter office. He was a Democrat, but on the formation of the Republican party he helped in its organization, and has since belonged to that party, He was a delegate to the Chicago convention which nominated Lincoln; he organized the department of internal revenue, and was its first commissioner; was twice elected to Congress; was chairman of the committee to report articles for President Johnson's impeachment, and was one of the seven managers of the impeachment. President Grant called him to be Secretary of the Treasury. In this office he was accused of violating law, but although the House absolved him, Mr. Boutwell resigned, March, 1873, and entered the United States Senate, having been chosen to fill the unexpired term of Hon. Henry Wilson, who had been elected Vice-President of the United States. He was for six years an overseer of Harvard, and has written on educational topics, taxation and politics.



GEORGE S. BOUTWELL.

BOUVARDIA (named in honor of Dr. Bouvard, director of the Jardin des Plantes, Paris), a Mexican and Central American genus of shrubs or low trees, belonging to the large tropical family *Rubiaceæ*, and associated with the *Cinchona* order. The flowers are in brilliant clusters, of various colors, at the ends of the branches, the corolla being a long and slender, often trumpet-shaped, tube. The common species of the greenhouses is *B. triphylla*, with scarlet flowers and leaves in whorls of three, although *B. Ciantha*, with more downy leaves and smooth, deep scarlet flowers, is becoming common as a house-plant.

BOUVIER, JOHN, American jurist; born in Codogno, Italy, in 1787; died Nov. 18, 1851, in Philadelphia, Pennsylvania. His family settled in Philadelphia in 1802, and 12 years later Mr. Bouvier became the editor of the *American Telegraph*, published

in Brownsville, Pennsylvania. In 1818 he was admitted to the bar at Unionville, Pennsylvania, and in 1823 began to practice in Philadelphia, where, in 1838, he became associate judge of the court of criminal sessions. At that time he published a *Law Dictionary* adapted to the constitution and laws of the United States. This work, representing many years of labor, was very favorably received. His greatest work, *Institute of American Law*, was published but shortly before his death.

BOUVINES, a village in the French department of Nord, 8 miles S.E. of Lille, the scene of the victory of Philip Augustus of France over the Emperor Otto IV in 1214—commemorated by a monument (1863)—and a series of struggles in 1794 between the Austrians under Kinsky and the victorious French Army of the North. Population, 900. See FRANCE, Vol. IX, p. 542.

BOVIANUM, the ancient capital of the Pentri, in the heart of Monte Matese, Italy, 13 miles S.W. of the present town of Campobasso. It was once a powerful and wealthy city, and ancient ruins still exist. It was captured by the Romans in 311 B.C., and later Cæsar established there a military colony. The modern town of Bojano occupies the site. Bojano is a quiet town of about 3,500 population, and has a fine cathedral.

BOVIDÆ. See MAMMALIA, Vol. XV, p. 432.

BOW, the general name for the stem and fore part of a ship, beginning where the sides trend inward, and terminating where they close or unite in the prow. The word is often used in the plural, the ship being considered to have starboard and port bows. A narrow bow is called by seamen a *lean* bow, and a broad one is called a *bold* or *bluff* bow. The "V-form," or "U-form," is a nomenclature adopted by the naval architect to denote the character of a section of a bow.

BOWDITCH, NATHANIEL INGERSOLL, author; born in Salem, Massachusetts, Jan. 17, 1805; died in Brookline, Massachusetts, April 16, 1861. He was a Harvard graduate, studied law and became a conveyancer. It is said that scarcely a transfer of real estate took place in Boston without his examination of the title. He derived a large income from his profession, and made a gift of $72,000 to Harvard College for scholarships and books.

BOWDLER, THOMAS, editor and expurgator, was born at Ashley, near Bath, England, July 11, 1754. He graduated from Edinburgh in 1776, and, after some years of travel, settled in London, devoting himself to charitable work. He lived for ten years at Saint Boniface, Isle of Wight, and for the last fifteen years of his life at Rhyddings, near Swansea, where he died, Feb. 24, 1825.

In 1818 Bowdler published "*The Family Shakspeare*, in 10 volumes, in which nothing is added to the original text; but those words and expressions are omitted which cannot with propriety be read aloud in a family." The work had a large sale, and was long popular, spite of the ridicule it brought down upon the head of its over-prudish editor, whose name has been immortalized by the addition to the English tongue of the term *Bowdlerism* as a synonym for senseless expurgation. The last years of Bowdler's life were devoted to preparing a purified edition of Gibbon's *History*, which was published in six volumes the year after his death, edited by his nephew, under the title "*Gibbon's History of the Decline and Fall of the Roman Empire*, for the use of families and young persons, reprinted from the original text, with the careful omission of all passages of an irreligious or immoral tendency." In a note the editor says that "it was the peculiar happiness of the writer to have so purged Shakspeare and Gibbon that they could no longer 'raise a blush on the cheek of modest innocence, nor plant a pang in the heart of the devout Christian.'"

BOWDOIN, JAMES, an American statesman and author, born in Boston, Aug. 8, 1727; died in the same city, Nov. 6, 1790. He graduated at Harvard in 1745. In his correspondence with Benjamin Franklin he first suggested the theory that the phosphorescence of the sea was due to the presence of minute animalculæ, a theory since generally accepted. Later Mr. Franklin read Bowdoin's letters before the



SEARLES SCIENCE BUILDING, BOWDOIN COLLEGE.

Royal Society of London, by whom they were published. In 1778 he was president of the convention by which the constitution of Massachusetts was framed. He was governor of Massachusetts in 1785 and 1786, suppressing, in the latter year, the Shays rebellion. Bowdoin College was named in his honor.

BOWDOIN, JAMES, son of the preceding, was born Sept. 22, 1752, in Boston; died on Naushon Island, Buzzard's Bay, Massachusetts, Oct. 11, 1811. He graduated from Harvard, spent a year in college at Oxford, England, traveled in that country and on the Continent, and on his return to the United States engaged in politics and literary pursuits. He was a member of the state assembly, senate and council. The government sent him as minister to Spain in 1804, and commissioned him to treat with that foreign country with regard to "wrongful captures and other injuries" inflicted by the Spaniards, and to negotiate concerning the cession of Florida to the United States. On the establishment of Bowdoin College, named in honor of his father, he gave it 6,000 acres of land, £1,100, and bequeathed to it a large library, paintings, and a collection of mineral and philosophical apparatus.

BOWDOIN COLLEGE, one of the oldest educational institutions in the United States, was chartered in 1794, and established at Brunswick, Maine, in 1802. In 1820 the Medical School of Maine, afterwards incorporated with Bowdoin, was founded. Bowdoin takes its name from Governor James Bowdoin (q.v., in these Supplements). The institution occupies 11 buildings, conveniently located upon a handsome campus. The students in attendance are about 300. Women are not admitted. There are 30 members of the faculty. In 1885 the Rev. William De Witt Hyde became the president of Bowdoin. Among Bowdoin's many illustrious graduates may be mentioned Henry W. Longfellow, Nathaniel Hawthorne, Chief Justice Fuller and Thomas B. Reed.

BOWDON, a village of Carroll County, western Georgia, 60 miles W.S.W. of Atlanta. It has cottongins and saw and grist mills. Cotton is its principal product. Some gold has been found near here. It is the seat of Bowdon (a small non-sectarian) College. Population 1890, 354.

BOWELL, SIR MACKENZIE, Canadian premier and statesman; born at Rickinghall, Suffolk, England, Dec. 27, 1823. His family emigrated to America when he was 10 years old, and he was apprenticed to the printer's trade in Belleville, Canada, where he afterwards became editor and proprietor of the *Intelligencer*. In 1863 he actively entered politics, and four years later was elected to the first Dominion Parliament, where he remained prominent for more than 25 years. He was a member of the Privy Council and Minister of Customs from 1878 until 1892, when he became Minister of Militia and Defense. Upon the 14th of December, 1894, after the death of Sir John Thompson, he became premier. The Queen knighted him upon the 1st of January, 1894. In the upheaval in the Dominion Cabinet that took place in the summer of 1896, Sir Mackenzie Bowell resigned in favor of Sir Charles Tupper. The latter was subsequently ousted by Mr. Wilfred Laurier, the French-Canadian Liberal, who succeeded to the Canadian Premiership.

BOWEN, FRANCIS, author; born in Charlestown, Massachusetts, Sept. 8, 1811; was a Harvard graduate, and after finishing his course gave instruction there in intellectual philosophy and political economy from 1835 to 1839. He went to Europe in 1893, and upon his return to Cambridge in 1851 devoted himself to literary labors, and two years later started the *North American Review*, whose editor and chief contributor he remained until 1853. He was then appointed to the Alford professorship of natural religion, moral philosophy and civil polity in Harvard. Professor Bowen opposed Adam Smith's views on free trade, and the philosophical systems of Kant and John Stuart Mill. He lectured extensively upon the English philosophers, and wrote *Principles of Political Economy Applied to the Condition, Resources and Institutions of the American People; Gleanings from Literary Life; Treatise on Logic*, and works of a similar nature. He died in Cambridge, Massachusetts, Sept. 21, 1890.

BOWEN, SIR GEORGE FERGUSON, colonial statesman, was born in 1821, and graduated from Oxford in 1844. In the same year he became a member of Lincoln's Inn. He was chief secretary to the government of the Ionian Islands from 1854 to 1859, and was first governor of the new colony of Queensland, in Australia. He was appointed, in 1868, governor of New Zealand, and in 1873, governor of Victoria; was governor of Mauritius from 1875 to 1883, when he was appointed governor of Hongkong. He retired on pension in 1887, but in 1888 was appointed royal commissioner at Malta to make arrangements respecting the new constitution granted to that island. In 1893 he served as a representative of Great Britain on the board of arbitration to settle the Bering Sea question. Sir George Bowen has written several books of travel, among which are *A Handbook for Travelers in Greece; Ithaca in 1850;* and *A Diary of a Journey from Constantinople to Corfu.*

BOWEN, HENRY CHANDLER, editor and publisher, was born at Woodstock, Connecticut, Sept. 11, 1813; died in Brooklyn, New York, Feb. 24, 1896. At the age of 20 he entered the silk business in New York City, and remained in it until the outbreak of the Civil War, at which time he had become one of the most prosperous merchants in the city. Inability to make collections throughout the country forced his firm to make an assignment, afterwards meeting the full amount of their obligations. In 1848 Mr. Bowen and four others founded *The Independent*, a weekly semi-religious publication whose circulation and influence became great, and whose editor and publisher Mr. Bowen finally became and remained until his death. He was an intimate friend of Abraham Lincoln, who, in 1862, appointed him collector of internal revenue of the third New York district.



HENRY C. BOWEN.

BOWEN, NATHANIEL, an American divine, bishop of the Protestant Episcopal Church, born June 28, 1779, in Boston, Massachusetts; died in Charleston, South Carolina, Aug. 25, 1839. In 1787 his family removed to South Carolina, where, in 1794, he graduated from Charleston College. He prepared for the ministry in the North, and, after holding various pastorates, became in 1809 rector of Grace Church, New York City, and in 1818 bishop of South Carolina. His untiring fidelity to his work earned him great popularity and influence in his church. Several volumes of his sermons have been published, among them a collection entitled *Christian Consolation.*

BOWENITE, a mineral described by George T. Bowen in 1822. It is a variety of serpentine of remarkable hardness. Its color is light green, and its texture granular. Bowenite bears a remarkable resemblance to jade (q.v., Vol. XIII, p. 540). It is chiefly found in Rhode Island, near Smithfield.

BOWER-BIRD, a name given to certain birds of the bird-of-paradise family, found only in Aus-

tralia and New Guinea. The birds receive their name from the arbor-like galleries or bowers which they construct. The bowers are built of twigs, and are gayly decorated with bright and conspicuous objects, such as shells, bones, feathers and flowers. These bowers are not nests, but are places of amusement, in the architecture and ornamentation of which the birds show wonderful skill and taste.

BOWIE-KNIFE, a heavy sheath-knife, used both as a hunting-dagger and weapon. It was named after its inventor, Colonel James Bowie, who fell at Fort Alamo, in the Texan war (1836). The blade is from 10 to 15 inches in length, double-edged near the point. The term is now frequently applied to any large sheath-knife, without regard to shape.

BOWLES, SAMUEL, an American journalist; born in Springfield, Massachusetts, Feb. 9, 1826; died there, Jan. 16, 1878. After receiving a public school education, he began work at the age of 17 in the office of the Springfield *Republican*, a paper owned and published by his father. In 1844 the paper became a daily, and from this time onward flourished. In 1851, by the death of his father, young Bowles, then only 25 years of age, was obliged to assume entire control. During the Civil War the Springfield *Republican* acquired a national reputation and great political influence. Mr. Bowles wrote *Across the Continent* (1865) *The Switzerland of America* (1869), and other works of American travel.

BOWLING GREEN, a beautiful city of Kentucky, county seat of Warren County, situated on Barren River, at the head of navigation, about 70 miles N. of Nashville. It is the trade center of southern Kentucky, and an important shipping-point for pork, tobacco, hay and grain. Its industries include manufactories of iron, woolens and cereal products. It is the seat of Ogden College and a Catholic academy, and contains excellent public schools. Population 1890, 7,803.

BOWLING GREEN, a village and the capital of Pike County, northeastern Missouri, 70 miles N.N.W. of St. Louis, on the St. Louis and Hannibal and the Chicago and Alton railroads. There are extensive stone-quarries in the vicinity. Pike College is located here. Population, 1,564.

BOWLING GREEN, the county seat of Wood County, northwestern Ohio, about 20 miles S. of Toledo. It is on the Cincinnati, Hamilton and Dayton and the Toledo and Ohio Central railroads. The discovery of oil and natural gas here (1885–86) has given a strong impulse of activity to the neighborhood. Wood County itself owns 104 of the oil-wells, yielding 10,400 barrels daily, and contains about 40 gas-wells, with a daily outflow of 160,000,000 cubic feet. Numerous manufactures have been started, trade is extending and the town has built water-works, and is otherwise improving. Population has doubled since 1885, being now about 4,500.

BOWMAN, THOMAS, an American divine, bishop of the Methodist Episcopal denomination, was born July 15, 1817, at Berwick, Pennsylvania. He graduated from Dickinson College, and 10 years later, in 1848, became president of Dickinson Seminary at Williamsport, Pennsylvania. From 1858 to 1872 he was president of Asbury University, now Depauw, at Greencastle, Indiana, and during this time served once as chaplain of the United States Senate. In 1872 he was chosen bishop of the Methodist Episcopal Church, with residence at St. Louis. He was retired in 1896.

BOWMAN, SIR WILLIAM, oculist, was born in Nantwick, England, July 20, 1816. He studied chiefly in London, where he commenced practice as a surgeon, and became curator of the Anatomical Museum. In conjunction with Todd he published the *Physiological Anatomy and Physiology of Man* (5 vols., 1845–56), and gained a high reputation as an oculist by his *Lectures on Operations on the Eye* (1849), followed by his *Observations on the Artificial Pupil.* He was professor of physiology at King's College (1845–55). He became consulting-surgeon and vice-president of King's College, London (1877), and a baronet (1884).

BOWMANVILLE, a thriving town of Durham County, central Ontario, pleasantly situated near the shore of Lake Ontario, on the Grand Trunk railroad, about 40 miles N.E. of Toronto. It is a port of entry, has an excellent harbor, and contains manufactories of machinery, castings, boots and shoes, woolen goods, carriages, cabinet-ware, lumber and leather. Population, 3,377.

BOWNE, BORDEN PARKER, American scholar and writer upon philosophical subjects, was born Jan. 14, 1847, at Leonardville, New Jersey. In 1871 he graduated from the University of the City of New York; spent the next two years in study at European universities, and then became connected with the New York *Independent.* In 1876 he was chosen professor of philosophy in Boston University. Professor Bowne's writings include *Studies in Theism; Introduction to Psychological Theory; Philosophy of Herbert Spencer;* and *Principles of Ethics.*

BOWSPRIT, a strong boom or spar projecting over the stem or bow of a ship. Its use is to support the jib-boom, a longer and lighter spar, forming a continuation of the bowsprit, which receives the lower ends of the foremast stay-ropes, on which sails are carried. See SEAMANSHIP, Vol. XXI, p. 594.

BOWSTRING HEMP OR MOORVA, the fiber of *Sanseviera*, which is an Asiatic and African genus of the monocotyledonous family *Hæmodoraceæ*, related to the bromelias and irises. The fiber is hair-like, silky and elastic, and in strength is apparently about equal to hemp. The best-known species is *S. Zeylanica* of the East Indies, but other Asiatic and African species have appeared in the market.

BOWYER, SIR GEORGE, baronet, and writer of legal works, was born at Dudley, England, near Oxford, in 1811; died in London, June 7, 1883. He was called to the bar in 1839, represented Dundalk in Parliament in 1852–68, and the county of Wexford in 1874–80, when his Home Rule principles estranged him from the Liberal party, and in 1876 led to his expulsion from the Reform Club. He was author of several able works on constitutional law. Among these are *Commentaries on the Modern Civil Law of England* and *On Universal Public Law.*

BOX-ELDER, a common name, applied to *Negundo aceroides*, a tree of the family *Sapindaceæ*, but

sometimes separated, with its nearest ally (*Acer*)—the maple—as a separate family (*Aceraceæ*). *Negundo* is is a handsome tree, growing throughout the Atlantic region of the United States, and extending westward into the plains region. It has light green twigs, drooping clusters of small greenish flowers in early spring, ovate-toothed leaflets, and pendent clusters of winged maple-like fruits. It is frequently cultivated for ornament, sometimes with white variegated leaves, often called "ash-leaved maple."

BOXHAULING OR CLUBHAULING, a mode of turning a ship when the swell of the sea renders tacking impossible, or when the ship is too near the shore to allow room for veering. *Boxing-off* is a very similar operation. See SEAMANSHIP, Vol. XXI, pp. 600 and 603.

BOXTEL, a town in the Dutch province of North Brabant, in the southern Netherlands, 38 miles S.E. of Utrecht. An Anglo-Dutch army under the Duke of York was here defeated with great loss by the French in 1794. The river Dommel flows through the town, and is utilized for transporting its merchandise and the cotton goods manufactured here. Population, 5,700.

BOXTHORN, a common name applied to *Lycium*, a genus of the family *Solanaceæ*, having funnel-shaped or tubular flowers and two-celled berries. Several species are natives of the south of Europe, thorny shrubs with long slender shoots and simple lanceolate leaves. *Lycium Europæum* may be trained to a height of 30 or 40 feet, and is often planted—as are also other species—to cover walls, etc. *Lycium vulgare* (known as "matrimony vine") has been sparingly naturalized in the United States. *Lycium fuchsioides*, although destitute of spines, is used as a hedge-plant in the Andes of Quito.

BOX-TORTOISE OR BOX-TURTLE, a turtle of the family *Kinostemidæ*, having the vertical shell-plate or plastron divided into two or three parts, which are united by a hinge, and can be drawn up against the carapace so as to completely inclose the animal. They are chiefly American.

BOYAR OR BOLAR, an old Russian title. The boyars were next in rank to the ruling princes, and were privileged with high authority. All royal edicts bore the stamp of the boyar's approval immediately after the "command of the czar." It was their privilege to attach themselves and their followers to any prince whom they might choose, but whose service it was their right to leave at their own option. Peter the Great, who abolished the order, ennobled the boyars, but deprived them of their high authority. See Moscow, Vol. XVI, p. 859.

BOY-BISHOP. The custom of electing a boy-bishop on St. Nicholas's day dates from a very early period. It spread over most Catholic countries, and prevailed in almost every parish of England. The election took place on St. Nicholas's day (December 6th), and the authority conferred lasted to Holy Innocents's Day (December 28th). The boy-bishop, chosen from the children of the church or cathedral choir, or from the pupils at the grammar school, arrayed in episcopal vestments, and attended by a crowd of subordinates in priestly dress, went about with songs and dances from house to house, blessing the people. The mock prelate exacted implicit obedience from his fellows, who, with their superior, took possession of the church, and performed all the ceremonies and offices except mass. In 1299 Edward I, on his way to Scotland, permitted a boy-bishop to say vespers before him at Heaton, near Newcastle-on-Tyne. At Salisbury the boy-bishop, it is said, had the power of disposing of such prebends as happened to fall vacant during the days of his episcopacy. The custom was abolished in England by a proclamation of Henry VIII, dated July 22, 1542; it was restored by Queen Mary in 1554, and again abolished during the reign of Elizabeth, though it seems to have lingered here and there in villages till about the close of her reign. On the Continent it was the subject of a formal interdict at the Council of Basel (1431); and at Zug, in Switzerland, a similar usage was suppressed so recently as 1797.

BOYCOTTING, an expression which has but recently appeared in the English language, and signifying a combination between persons to suspend and refrain from all dealings with another person or persons because of a refusal to comply with a request or demand made. The purpose is to make the situation so unpleasant for the person who has rendered himself obnoxious to those making the demand of him, that he will be forced to comply. The term arises from an incident which occurred during the agrarian and antirent conspiracy in the district of Connemara, in the west of Ireland, in the year 1880. The agent of Lord Erne, a large land-owner in that region, was a retired army captain named Boycott, who made himself obnoxious to Lord Erne's tenants by serving notice on them to vacate their holdings for non-payment of rent. The tenantry retaliated by resolving to have nothing to do with Captain Boycott, and, in so far as it was in their power, to prevent others from having any dealings or intercourse whatever with him. His servants were persuaded to leave him, and he could only obtain emergency-men to work on his estate. No one in the district would supply him with food, and he was obliged to accept police protection to prevent assassination. He was for a time as helpless and alone as if under sentence of excommunication. From this incident came the word *Boycott*, which is now a recognized expression in general use. In many states boycotting, if it be in the nature of a conspiracy to prevent the carrying on of a lawful business, or to injure such lawful business by means of threats, intimidation or other forcible means, is prohibited and punishable by statute. See also HOME RULE, in these Supplements.

BOYD, ANDREW KENNEDY HUTCHISON, an English author and clergyman; born at Auchinleck, Ayrshire, Scotland, Nov. 3, 1825. He was educated at King's College, London, and Glasgow University, where he took the highest honors in philosophy and theology. He first became known in literature by his essays, published in *Fraser's Magazine*, over the initials, A. K. H. B. He is the author of *Recreations of a Country Parson* (three series, 1859–61), and of many volumes of sermons, under the titles of *The Graver*

*Thoughts of a Country Parson; Counsel and Comfort Spoken from a City Pulpit; Memorials of St. Andrew's Sundays; Towards the Sunset; The Best Last;* and *Twenty-five Years of St. Andrews.* In May, 1890, he was elected moderator of the General Assembly of the Church of Scotland.

BOYDE, JAMES PETIGRU, an American Baptist clergyman and writer upon religious subjects, was born Jan. 11, 1827, in Charleston, South Carolina; died Dec. 28, 1888, at Pau, France. An alumnus of Brown, he was graduated at Princeton Theological Seminary in 1851, and was at once ordained, and became the minister of the Baptist Church at Columbia, South Carolina. Four years later he was chosen professor of theology at Furman University, and in 1858 became connected with the Baptist Theological Seminary at Greenville. From 1862 to 1864 he was a member of the South Carolina legislature, having served for six months as a chaplain in the Confederate army. By his published sermons and other writings, and as president of the Southern Baptist Convention, he exerted a marked influence, and did much to mold opinion among the Baptists in the South.

BOYDEN, SETH, an American inventor and manufacturer, was born at Foxboro, Massachusetts, Nov. 17, 1788; died in Middleville, New Jersey, March 31, 1870. He began the manufacture of patent leather in 1819 at Newark, New Jersey, where he invented a machine for splitting leather and a process for making spelter. Among his other inventions and discoveries were a doming-machine for hats, and a process for making Russia sheet-iron. He built one of the first locomotives with outside cylinders, and is thought by many to have made the first daguerreotype in the United States.

BOYESEN, HJALMAR HJORTH, author; born in Frederiksvärn, Norway, Sept. 23, 1848. He was educated at the Gymnasium in Christiania, and graduated in 1868 at the University of Norway, having pursued a course of study at Leipsic, Germany. In the same year he came to the United States, where, in 1869, he became editor of *Fremad*, a Scandinavian paper printed in Chicago. From 1874 to 1880 he taught German in Cornell, and then was called to the same work at Columbia College, where, later, the chair of Germanic languages and literatures was created for him. During his residence in this country he has shown a marked aptitude for writing stories and poetry in English. He has been a frequent contributor to the magazines of the day. A partial list of his books is as follows: *Gunnar: A Norse Romance; A Norseman's Pilgrimage; Tales from Two Hemispheres; Goethe and Schiller: Their Lives and Works; Queen Titania; The Story of Norway; Ilka on the House-top.* The last-mentioned has been dramatized and successfully performed in New York. Among his later works are *Commentary on the Writings of Henrik Ibsen* and *Evolution of the Heroine.* He died in New York City, Oct. 4, 1895.



HJALMAR HJORTH BOYESEN.

BOYLE LECTURES, a perpetual series of lectures, endowed by property bequeathed by Robert Boyle (q.v., Vol. IV, p. 184), whose will provided for such disposition of his property that a fund should be provided to pay the annual salary of "some preaching minister," by whom, each year, there shall be delivered eight sermons "for proving the Christian religion against atheists, deists, pagans, Jews and Mohammedans, not descending to any controversies among Christians themselves." The office of Boyle lecturer is tenable for three years by the same person. These lectures have been continuous since 1691, and among the printed collections of those given by eminent theologians and others may be found some of the most celebrated contributions to theological literature. The earliest of the Boyle lecturers was Richard Bentley; q.v., Vol. III, pp. 578–580.

BOYLE'S LAW. See STEAM-ENGINE, Vol. XXII, p. 479; also ATMOSPHERE, Vol. III, p. 35.

BOYNTON, EDWARD CARLISLE, an American soldier and writer of military history, was born in 1825, in Vermont, and retired from the United States army, Dec. 1, 1872. In 1846 he graduated from West Point, and directly joined the army in Mexico, where he performed gallant service, and was severely wounded in the battle of Churubusco. From 1848 to 1855 he was an instructor at West Point, and in the latter year participated in a campaign against the Indians of Florida. In February, 1856, he left the service, and became professor of chemistry in the University of Mississippi, where he remained until the outbreak of the Civil War. In 1861 he was reappointed captain in the United States service, and was assigned to duty at West Point, where he remained throughout the war, receiving at its close a major's brevet. Major Boynton's writings include *History of West Point* and *Several Orders of George Washington, issued at Newburgh.*

BOYTON, PAUL, a daring and adventurous American navigator; born in Pittsburg, Pennsylvania, in 1848. Evincing from his earliest youth a fondness for aquatic pursuits, he enlisted in the navy in 1864, as soon as he was 15 years old. He participated in the assault on Fort Fisher and was mustered out with honor after Appomattox. Then he served for a while with the Mexican revolutionists in 1867, and afterwards worked as a life-saver at a summer resort, where, in a single season, he saved 14 lives. He enlisted in the French army for the Franco-Prussian war, and when the Bavarians stacked arms under the column Vendôme sailed to South Africa and tried diamond-hunting. Returning to America as a life-saver at Atlantic City, he improved upon the life-saving dress patented by C. S. Merriman of Iowa. In 1874 he landed near Cape Clear, on the Irish coast, in a stiff gale, clad in this costume, having jumped from a steamer over 20 miles from land. His next trips were across the English Channel, down the Rhine from Basel, and down the Mississippi from St. Louis to New Orleans. Then he returned to Europe, navigating the Danube, Po, Arno, Deber, Rhone, Loire and Tagus. The

Straits of Gibraltar were included in his victories. In 1879 he aided the Peruvians in torpedo warfare against the Chilians, and in 1881 paddled down the Yellowstone, from Glendive, in Montana, and the Missouri to St. Louis, a voyage of 3,580 miles.

BOZEMAN, a thriving city of southern Montana, capital of Gallatin County, beautifully situated on a small affluent of the Gallatin River, at the foot of the Bridger Mountains, about 100 miles S.E. of Helena, on the Northern Pacific railroad. It is the seat of an academy and a university school, and contains important manufactories of flour and lumber. It is the center of a rich agricultural region. Gold and silver are mined in the vicinity. The population in 1890 was 2,143.

BOZEN OR BOLZANO. See BOTZEN, Vol. IV, p. 169.

BOZÉRIAN, JULES FRANÇOIS JEANNOTTE, lawyer and senator of France, was born Oct. 28, 1825, in Paris. His practice as a lawyer was begun in the city of his birth, in 1852, and from that date his fame rapidly grew until he became one of the best-known advocates of his time. His political activity began in 1861, when he was elected a member of the Council-General of Vendôme. His election to the National Assembly took place in 1871. In 1876 he was chosen Senator for Loir-et-Cher, and was re-elected in 1879 and 1888. M. Bozérian was prominent in the discussion of all national questions of a financial or judicial nature. He published, in 1858, *The Bourse, Its Operators and Operations, Viewed from the Standpoint of the Law, of Jurisprudence and of Political and Social Economy;* in 1884, *Study upon the Revision of the Constitution of 1875.* A noteworthy essay of his, read before the Religious Society of the Christian Alliance, of which he became president in 1862, discusses a parallel between Fénélon and William Ellery Channing. M. Bozérian became an officer of the Legion of Honor, Dec. 11, 1880.

BRABANÇONS. From the fact that the irregular bands of mercenaries employed in the armies of John of England and of Philip II Augustus largely hailed from Brabant, the name *Brabançons* came to be loosely applied to the whole crowd of roving brigands and soldiers, who were a pest in France and England from 1100 to 1400.

BRABOURNE, EDWARD HUGESSEN KNATCHBULL-HUGESSEN, LORD, an English statesman and man of letters; born at Mersham Hatch, Kent, England, April 29, 1829; died Feb. 6, 1893. Having completed his studies at Eton and at Magdalen college, he sat in the House of Commons as a Liberal from 1857 until 1880. During this time he held several under-secretaryships and became a privy councilor. Mr. Gladstone gave him a peerage in 1880, and in 1885 he went over bodily to the Conservatives. He is best known as the author of *Tales at Tea-Time; Queer Folks; Whispers from Fairyland; River Legends, or River Thames and Father Rhine; Higgledy-Piggledy, or Stories for Everybody and Everybody's Children; Uncle Joe's Stories; Other Stories; Mountain Sprites' Kingdom; Ferdinand's Adventure, Puss-Cat Mew Stories,* and other books for the young.

BRACE, CHARLES LORING, an American author and humanitarian; born June 19, 1826, at Litchfield, Connecticut; died at Campfer, Switzerland, Aug. 11, 1890. His father, John Pierce Brace, an educator of much repute, was principal of the Hartford Female Seminary. In 1846 the son graduated from Yale, and continued his studies at Union Theological Seminary. *Walks and Talks of an American Farmer in England,* published by him in 1852, was founded upon an extensive pedestrian tour made in 1850 through Ireland, England, Belgium, Germany and Italy. At this time he devoted himself to serious study of the conditions of the poorer classes, and in 1853 he, with others, organized a children's aid society in the interests of the children of the poor in New York City. His establishment of a newsboys' lodging-house, and of other philanthropic institutions, soon followed. Mr. Brace remained an ardent worker in the cause of his adoption, traveling and lecturing extensively, and awakening a widespread interest in measures largely instituted by him for the elevation of the city poor. *Hungary in 1851; Homelife in Germany; The New West; Short Sermons for Newsboys; The Dangerous Classes of New York;* and *The Unknown God, or Inspiration Among Pre-Christian Races,* are from his pen.

BRACHELLI, HUGH FRANCIS, an Austrian statistician and geographer; was born Feb. 11, 1834, at Brünn, Austria. He took courses in law, philosophy and political economy at the University of Vienna, and when 19 years of age published *The States of Europe,* a work valuable for its statistics of political geography. His election to the professorship of statistics and of constitutional and administrative law in the Technical School of Vienna took place in 1863. In 1872 he was made the president of the newly created governmental Department of Statistics. Among his later books may be mentioned *The Empire of Austria; The Kingdom of Prussia and of the Secondary States of Germany; Switzerland; Italy;* and *Turkey and Greece.*

BRACHET, AUGUSTE, philologist of the Romance languages, was born at Tours, France, July 29, 1844. His philological studies led to his appointment, in 1864, to the staff of the National Library. His first published work was *Studies upon the Trouvères of the Thirteenth Century,* and this was followed by a series of works upon the language and literature of the middle ages, among which are a *Dictionary of Doublets; Historical Grammar;* and *Etymological Dictionary of the French Language.* M. Brachet's election to a professorship of Romance philology took place in 1870, when he became connected with the École des Hautes Études in Paris. After 1873, however, he devoted himself exclusively to traveling and authorship.

BRACHIAL ARTERY. See ANATOMY, Vol. I, p. 903.

BRACHISTOCHRONE, curve of quickest descent. See MAXIMA AND MINIMA, Vol. XV, p. 643.

BRACHYCEPHALIC. See ANTHROPOLOGY, Vol. II, p. 111.

BRACHYPTERÆ, a term applied by Cuvier to the short-winged diving-birds. The group included the grebes, auks, penguins, loons and similar birds.

BRACHYURA, a technical name applied to the

crab or short-tailed decapod crustaceans, in contrast to the *Macrura*, long-tailed forms, like the lobsters, where the abdomen is not tucked in on the under surface in the characteristic crab fashion.

BRACKENRIDGE, HENRY MARIE, American author and jurist, son of Hugh Henry Brackenridge (q.v., in these Supplements), was born in Pittsburg, May 11, 1786; died Jan. 18, 1871, in the same city. He began his legal studies when 15, and at 23 had been appointed district judge of New Orleans. At that time he devoted his attention chiefly to the study of Spanish law and the history of Louisiana, the results of these researches being published in 1812. He vigorously urged recognition, by the United States, of the South American republics, and in 1817 was appointed secretary of the commission sent to visit them. The observations made upon the journey were published by him in *A Voyage to South America*, the most reliable source of information concerning its subject-matter to be had in its time. In 1821 he was appointed United States judge for the western district of Florida, and in 1840, having taken up his residence in Pittsburg, was elected to Congress, but retired to private life without taking his seat. His writings include *Recollections of Persons and Places in the West; Essay on Trusts and Trustees;* and *History of the Western Insurrection.*

BRACKENRIDGE, HUGH HENRY, an American jurist, was born near Campbeltown, Scotland, in 1748; died at Carlisle, Pennsylvania, June 25, 1816. In 1821 his father settled in Pennsylvania. He graduated from Princeton (1771), then spent some years teaching there and in Maryland. At about this time he wrote for his pupils a drama, *Bunker Hill* (see AMERICAN LITERATURE, Vol. I, p. 722); edited the *United States Magazine;* studied divinity and served as chaplain in the army. Dropping these varied pursuits, he applied himself to law, was admitted to the bar, practiced in Pittsburg, Pennsylvania, and soon obtained such prominence that he was elected to the legislature (1786). In 1799 he was appointed to the supreme bench of the state, and held the office up to his death. He was author of poems and essays, but his best-known work is a story in the form of a political satire which is largely drawn from his own experiences, entitled *Modern Chivalry, or the Adventures of Captain Farrago and Teague O'Regan, his Servant.*

BRACKETT, ALBERT GALLATIN, an American soldier, was born Feb. 14, 1829, at Cherry Valley, New York. He served as a lieutenant with the Fourth Indiana volunteers in the Mexican War, and having been honorably discharged in 1848, he became, March 3, 1855, captain in the Second United States cavalry, and rendered gallant service in Indian encounters upon the Texan frontier. During the Civil War he was in command of the cavalry at the engagement of Blackburn's Ford, and at the first battle of Bull Run. In August, 1861, he was appointed colonel of the Ninth Illinois cavalry, and, having served in the campaign in Arkansas, was given commission as major in the First cavalry. In 1863 he was chief of cavalry of the department of the Missouri, and at the close of the war was brevetted colonel. He continued in the service in the West, and, March 20, 1879, then in command of the district of the Yellowstone, was appointed colonel of the Third cavalry. He has written *History of the United States Cavalry* and *General Lane's Brigade in Central Mexico.*

BRACKETT, WALTER M., an American painter, was born in Unity, Maine, June 14, 1823. Wholly self-taught, his attention was at first chiefly given to portraiture. Charles Sumner, Oliver Wendell Holmes and Edward Everett sat to him. His reputation, however, depends upon his more recent fishing-scenes, and the like. As a painter of fish, he is without a peer. His series representing the capture of a salmon with a fly is considered remarkable.

BRACKETTVILLE, a village and the capital of Kinney County, southwestern Texas, two miles from the Southern Pacific railroad station of Kinney. It is the center of a cattle-raising district. Population in 1890, 1,649.

BRACKLESHAM BEDS, a group of highly fossiliferous strata in the middle Eocene formation. See GEOLOGY, Vol. X, p. 361.

BRACTS, floral leaves. See BOTANY, Vol. IV, p. 119.

BRADBURY, WILLIAM BATCHELDER, an American musician and composer; born Oct. 6, 1816, at York, Maine, and died Jan. 7, 1868, in Montclair, New Jersey. His parents, themselves musical, saw to the careful training of this gifted young performer, who seemed able to master with remarkable ease all instruments whose study he undertook. In 1830 he removed to Boston, where, after a few years, he established a wide reputation as an organist and trainer of choruses. Several years of his life were spent under the best teachers in Germany, and upon his return to America he began the publication of books of music for use in choirs and schools. Of these there are more than 50 volumes, including *The Golden Chain; The Key-Note; Golden Trio; Temple Choir;* and *Fresh Laurels.* In association with his brother, he successfully engaged in the manufacture of pianos.

BRADDOCK, a manufacturing town of southwestern Pennsylvania, situated on the right bank of the Monongahela, 10 miles S.E. of Pittsburg. It contains important manufactories of railroad cars and steel rails, wire, etc., and is noted as the site of the battle of Braddock's Field. (See BRADDOCK, EDWARD, in these Supplements.) The town is growing rapidly. Population 1890, 8,561.

BRADDOCK, EDWARD, a British soldier; born in Perthshire, Scotland, about 1695; died near Pittsburg, Pennsylvania, July 13, 1755. He entered the Coldstream Guards, Oct. 11, 1710, and was made major-general, March 29, 1754, and in September, commander of all his Majesty's troops in America. Feb. 20, 1755, he debarked at Alexandria, where he met the Virginia levies, and on April 24th reached Frederick, Maryland, where he was joined by Washington, whom he invited to be his aide-de-camp, and Benjamin Franklin, then Postmaster-General of the colonies. He set out for Fort Cumberland, where all

the forces were to assemble, and on June 7th they started by the path marked out by Washington two years earlier. On July 9th the advance division under Colonel (afterward General) Gates was attacked by a band of French and Indians. Frightened by the war-whoop, which they heard for the first time, the British fell back in confusion, and Braddock tried to rally them against their invisible foes. Familiar with Indian warfare, the Virginians separated, and sought shelter behind rocks and trees, but Braddock, dispensing with the "military instruction of a Virginia colonel" named George Washington, kept his men drawn up in platoons, and they fired at random into the forest, killing many of the Americans, and falling themselves with great rapidity. Braddock's personal bravery was conspicuous, five horses being killed under him, while he was borne from the field to die. The battle ended in a rout, and of 1,460 men, including 89 commissioned officers, who had entered the field, 827 were killed or wounded. Of Braddock's aides Washington alone escaped, and he covered the retreat.

BRADDON, MARY ELIZABETH. See MAXWELL, MRS. JOHN, in these Supplements.

BRADFORD, a town in Essex County, northeastern Massachusetts, situated on the south bank of the Merrimac, opposite Haverhill, 32 miles N. from Boston, on the Boston and Maine railroad. It is the seat of Bradford Female Academy. Population 1890, 3,720.

BRADFORD, a city of McKean County, northern Pennsylvania, on a branch of the New York and Erie railroad, and also on the Rochester and Pittsburg railroad. It is 63 miles S.E. of Dunkirk, New York. It is lighted with natural gas, and is in the center of the petroleum region. It was incorporated as a city in 1879. Population 1880, 9,197; 1890, 10,514.

BRADFORD, a village in Orange County, eastern Vermont, on the Connecticut River and on the Boston and Maine railroad, about 30 miles S.E. of Montpelier. It is the seat of Bradford Academy, and has manufactures of paper, machinery, iron, flour, casks, and woolen goods. Population 1890, 610.

BRADFORD, ALDEN, an American author, born in Duxbury, Massachusetts, Nov. 19, 1765, of a noted family. He graduated at Harvard in 1786, and was pastor of the Congregational Church at Wiscasset, Maine, from 1793 until 1801, after which he was clerk of the supreme court of Massachusetts, a bookseller in Boston, and secretary of state from 1812 until 1824. Later he edited the Boston *Gazette*. He wrote numerous biographical works and histories of places in his state, besides which he was the author of *History of Massachusetts from 1764 until 1820* (1820); *History of the Federal Government* (1840). He died in Boston, Oct. 26, 1843.

BRADFORD, ALEXANDER WARFIELD, an American jurist, born in Albany, New York, in 1815. He graduated at Union College in 1832, and studying law, soon won distinction. In 1848 he was made surrogate of New York, to which office he was twice re-elected. He was connected with numerous famous legal cases, and prepared four volumes of *Reports of Surrogate Cases* and ten of *Bradford's Reports*. He edited a work on *American Antiquities*, and with Dr. Anthon edited *The Protestant Churchman*. He was one of the commissioners appointed to codify the laws of the state. Died in New York City, Nov. 5, 1867.

BRADFORD, AMORY HOWE, an American Congregational minister, born in Granby, New York, April 14, 1846. He graduated from Hamilton College in 1867, studied at Auburn Theological Seminary, and was graduated at Andover Theological Seminary in 1870. In the latter year he became pastor at Montclair, New Jersey, and was conspicuously successful in his charge. In 1893 he had a call from London, England, but declined. He lectured in 1892–93 on Congregationalism, at Andover Seminary. He is president of the American Institute of Christian Philosophy, is an editorial writer on *The Outlook* and *The Christian Union*, and is author of *Spirit and Life* (1881); *Old Wine: New Bottles* (1892).

BRADFORD CLAY, in geology, a subdivision of the great oölite (lower oölite), a blue, slightly calcareous clay, occurring at Bradford, in England, and extending for some miles in the vicinity. It is about 10 feet thick at Bradford, but may be thicker at Farleigh. It is remarkable for the occurrence in it of large numbers of a crinoid (*Apiocrinites Parkinsoni*). Although Bradford clay is considered a local deposit, yet deposits containing the same fossils occur in Dorsetshire. See GEOLOGY, Vol. X, pp. 354, 355.

BRADFORD-ON-AVON, a town of England, situated on both sides of the Avon, and on the Kennet and Avon canal, 9 miles S.E. of Bath. It is an ancient town, and still shows some gable-fronted houses built and roofed with stone. Formerly it was the seat of important woolen manufactures, and kerseymeres were first made here. The tiny church of St. Lawrence, built by St. Aldhelm between 675 and 709, is the only perfect building of pre-Norman times now remaining in England. (See WILTS, Vol. XXIV, p. 595.) Near by, on the site of Aldhelm's monastery, is the parish church of the Holy Trinity, of various dates, from the twelfth to the sixteenth century, and restored in 1865–66. On the summit of Torr Hill are the ruins of a fourteenth-century chapel of the Virgin. In the neighborhood is the pleasant valley of Avon, with many picturesque spots. At Bradford, Cenwalh, king of the West Saxons, gained a great victory over the Welsh in 652. Population 1891, 4,957.

BRADFORD, WILLIAM, colonial governor; born in Austerfield, Yorkshire, England, March, 1590; died in Plymouth, Massachusetts, May 9, 1657. From childhood he was religiously inclined, and at an early age joined the Puritan congregation at Scrooby Manor. (See INDEPENDENTS, Vol. XII, pp. 725, 726.) Persecution arose in Nottinghamshire, and the Puritans, or Separatists, emigrated to Holland as they could find

opportunity. (See ROBINSON, JOHN, Vol. XX, p. 608). After imprisonment and delay, Bradford and his companions reached Amsterdam in 1608, and joined the colony there, which in 1609 removed to Leyden, and in 1620 to America. See MASSACHUSETTS, Vol. XV, p. 615.

A patent was obtained for the settlement from the New England council in 1629. It was a grant of the Plymouth plantation to William Bradford, his heirs, associates, etc. In 1640 he made over the property to the body of colonists, reserving for himself no more than one settler's share.

His leisure was largely spent in writing, and after his death the interesting manuscripts were published. Among them were the following: *A Diary of Occurrences* (relating the history of the colony during the first year, and written with the help of Edward Winslow); *Some Observations of God's Merciful Dealings With Us in this Wilderness; A Word to Plymouth; Memoir of Elder Brewster;* and *History of Plymouth Plantation.*

BRADFORD, WILLIAM, an American painter; born in New Bedford, Massachusetts, in 1827. Up to middle life he followed the mercantile profession, when he met with reverses, and began to paint marine views as a means of livelihood. He had previously attained some artistic proficiency by practice in leisure hours. His work was in colors, India ink and oils. He made an Arctic excursion with Dr. Hayes and others, and from studies of snow, ships and icebergs then made he painted many famous scenes. His *Steamer Panther Among Icebergs and Field-Ice in Melville Bay, Under the Light of the Midnight Sun*, was exhibited at the Royal Academy, London, in 1875, by command of her Majesty, who had purchased it. Some of his best works are *Shipwreck off Nantucket; Sudden Squall in the Bay of Fundy; The Coast of Labrador;* and *Sunset in the North.* He was elected an associate of the National Academy, New York, in 1874. He died in New York, April 25, 1892.

BRADFORD, WILLIAM, an American printer; born in Leicester, England, May 20, 1658. He was one of the original Quakers who settled on the spot that became the site of Philadelphia. In 1685 he set up a printing-press, which was the first in Pennsylvania and the third in the colonies, his first publication being his *Kalendarium Pennsilvaniese for 1686.* A few years later he joined in the establishment of a paper-mill on the Schuylkill. He printed George Keith's polemical tracts against the New England authorities, for which he incurred the displeasure of the authorities, was arrested and his press confiscated. He was tried for seditious libel, conducting his own defense, but the jury disagreed. He accepted an invitation to establish a printing-press in New York City, and settled there in 1693; was appointed public printer, and also printer to the government of New Jersey. In the fall of 1725 he began the publication of the New York *Gazette*, the fourth newspaper established in the country, and in 1728 he established a paper-mill in Elizabethtown, New York. He retained the office of public printer for 50 years, and died in New York City, May 23, 1752.

BRADING, a small but ancient town, once a Parliamentary borough, in the Isle of Wight, off the coast of England, four miles S. of Ryde by rail. In 1880 the remains of a Roman villa with a tessellated floor were unearthed near the town. In the ruins, assumed to be those of the villa of the Roman governor, were found numerous coins and tiles; there are also traces of a whole row of buildings.

BRADKE, PETER VON, a German philologist; born in Livonia, June 27, 1853. He studied at Dorpat and Tübingen, and became professor of Sanskrit and comparative philology in the University of Giessen, in Hesse. Among his works are *Studies and Researches into Indo-Germanic Religious History* (1885); *Contributions to our Knowledge of the Early History of Speech-Roots* (1888); *Upon the Ancient Origin of the Aryan Idioms* (1888); *On the Method and Results of Aryan Archæology* (1890).

BRADLAUGH, CHARLES, an English social reformer, but vigorous anti-socialist; born in London in 1833; died Jan. 30, 1891. Early dependent upon his own efforts, he was in turn errand-boy, small coal merchant and private of dragoons. Procuring his discharge from the army in 1853, he became clerk to a solicitor, and was soon a busy secularist lecturer; a pamphleteer under the pseudonym of "Iconoclast," and established and edited *The National Reformer.* In 1880 he was elected member of Parliament for Northampton. He at first refused to take the Parliamentary oath, then offered to take it; but as he had been loud in his avowal of atheism, the House refused to allow him even to affirm. He was thrice re-elected by Northampton, and at length, in 1886, having taken the oath, he was allowed to take his seat. In Parliament he gained respect by his strong sense, his debating power, and his knowledge of international law, and he earned wide popularity by his agitation against perpetual pensions. Of Bradlaugh's writings the best known are his *Impeachment of the House of Brunswick* and *Heresy: Its Utility and Morality.* His republication, in conjunction with Mrs. Annie Besant, of an old pamphlet, *The Fruits of Philosophy*, led, in 1876, to a sentence of six months' imprisonment and a fine of $1,000, but the conviction was quashed for technical defects in the indictment on appeal, during what proved to be Mr. Bradlaugh's last illness. On Jan. 27, 1891, a motion was made and carried in the House of Commons that the action of Parliament by which he was ejected from that body in 1880 be expunged from the record. He learned of it on his deathbed.

BRADLEY, REV. EDWARD, better known by the pseudonym of "Cuthbert Bede," was born at Kidderminster, England, in 1827, and educated at Durham University. He was successively rector of Denton, Huntingdonshire, of Shelton, near Oakham, and of Lenton, near Grantham. His facetious description of Oxford life in *Adventures*

*of Verdant Green* (1853–57) has been exceedingly popular, and was followed by the *Book of Beauty* (1856); *Fairy Fables* (1858); *Glencraggan* (1861); *Tales of College Life* (1862); *Little Mr. Bouncer and his Friend Verdant Green* (1873); *Fotheringay* (1885); etc. He died in Lenton, Dec. 12, 1889.

BRADLEY, GEORGE GRANVILLE, an English clergyman and author; born in High Wycombe, Dec. 11, 1821. He was a pupil of Dr. Arnold at Rugby, and of Dean Stanley at Oxford. He became assistant master at Rugby in 1846, and head master of Marlborough College in 1858, and master of University College, Oxford, in 1870. After holding the post of honorary chaplain to the Queen for a year (1874–75) he was appointed chaplain in ordinary in 1876, holding the position until 1881, when he succeeded, on the death of Dean Stanley, to the deanery of Westminster. He has published a number of sermons preached at Westminster, and among his other works are *Recollections of Arthur Penrhyn Stanley* (1883); *Lectures on Ecclesiastes* (1885); *Lectures on Job* (1888).

BRADLEY, JOSEPH P., jurist; born in Berne, New York, March 14, 1813. In his youth his educational advantages were at first very meager, but a clergyman prepared him for college, and he pursued the course at Rutgers, graduating in 1836. He studied law, was admitted to the bar in 1839, and for a number of years practiced in Newark, New Jersey. His services were sought in important cases, and he was highly esteemed as an orator. In 1870 President Grant appointed him to the supreme court bench and circuit justice for the Southern circuit; later he was assigned to the third circuit, comprehending the states of Pennsylvania, New Jersey and Delaware. While in the supreme court many intricate cases came up for decision —Civil War cases, maritime cases, and others of like importance. In 1877 he was a member of the commission which passed upon the electoral votes of Florida, Louisiana and South Carolina, his vote awarding them to R. B. Hayes. Justice Bradley died in Washington, District of Columbia, Jan. 25, 1892.



JOSEPH P. BRADLEY.

BRADLEY, WILLIAM O'CONNELL, governor of Kentucky, an American statesman; born in Lancaster, Garrard County, Kentucky, March 18, 1847. He enlisted in the Federal army at the age of 14, and three years later was admitted to the bar by a special act of the legislature. In 1870 he was elected prosecuting attorney, and in 1872 and 1876 made the race for Congress, but was defeated. In 1880 he was a delegate-at-large to the Chicago convention and seconded the nomination of Grant. He was again a delegate in 1884 and a member of the national committee. President Arthur selected him to aid in prosecuting the Star Route thieves, but a difference with the Attorney-general caused him to give up the appointment. In 1887 he ran for governor against General Buckner, and cut down the Democratic majority very largely, running about 3,000 votes ahead of his ticket, He was at the head of the Kentucky delegation to the national Republican conventions of 1888 and 1892, and in 1895 was elected governor of Kentucky.

BRADSHAW, HENRY, an English bibliographer; born in London, Feb. 2, 1831. He was educated at King's College, Cambridge, becoming a fellow in 1853; and after having been assistant librarian, he was appointed chief librarian in 1867. His knowledge of bibliography was unequaled, and his stores of information were ever at the service of students in all departments of literature, which proved a resource of the greatest benefit to those who drew upon it. He published a number of *Memoranda*, and projected an edition of the works of Chaucer, and commenced his *Liber Niger of Lincoln Cathedral*, but his early death interfered with their completion, the latter being, however, incorporated in *The Statutes of Lincoln Cathedral*, published by C. Wordsworth (1892). A collected edition of his papers, including his famous bibliographical memoranda and communications to the Cambridge Antiquarian Society were, with 13 fac-similes, edited by F. J. H. Jenkinson, M.A., and published in 1889.

BRADSTREET, ANNE, poet; born in Northampton, England, about 1612; died Sept. 16, 1672. She was a daughter of Governor Thomas Dudley, and was married to Governor Bradstreet in 1628. She published, in London, in 1650, a book of poems entitled *The Tenth Muse, Lately Sprung up in America.* Her complete works, prose and verse, were published in Charlestown, Massachusetts in 1868. In 1666 a fire destroyed her entire library. Her verses are founded on good English models, but lack originality, ease and novelty.

BRADSTREET, SIMON, colonial governor of Massachusetts from 1679 to 1686, and from 1689 to 1692; born at Horbling, Lincolnshire, England, in March, 1603; died at Salem, Massachusetts, March 27, 1697. He was educated at Cambridge, and, having been chosen assistant judge of the court to be established in the Massachusetts colony, sailed for the New World, and arrived at Salem in 1630. During his public life of more than sixty years he held prominent and responsible government positions, in all of which he showed himself able and trustworthy. He visited England in 1660 as agent for the colony and to congratulate Charles II on his restoration. Bradstreet opposed the witchcraft delusion at Salem in 1692. He was one of the founders of Cambridge, and was connected with the settling of others of the early New England towns.

BRADY, WILLIAM MAZIERE, an Irish churchman; born in Dublin in 1825, his family being prominently identified with public affairs. He was graduated at Trinity College, Dublin. On being ordained, he was appointed chaplain to

several successive lord-lieutenants, and became rector of Farahy, County Cork, in 1851, and later of Donoughpatrick, Meath. Though adhering to the Protestant and established church, he was outspoken in his criticisms thereon, and finally resigned his appointments and entered the Roman Catholic Church in 1873. He was instrumental in securing the disestablishment of the Protestant Church in Ireland. He was the author of many antiquarian and other writings, among which are *The Irish Reformation and Alleged Conversion of the Irish Bishops* (1866); *Essays on the Irish-English State Church in Ireland* (1869); *The Episcopal Succession in England, Scotland and Ireland, A.D. 1400 to 1875* (1876); *Annals of the Catholic Hierarchy in England and Scotland, A.D. 1585 to 1876* (1877); *Rome and Fenianism* (1883); *Anglo-Roman Papers* (1890); etc.

BRAEMAR, a highland district of Scotland, occupying the southwest corner of Aberdeenshire, in the heart of the Grampian Mountains. It is noted for its cairngorms and other gems. The Braemar pine is the most prized of all the British firs. Castletown of Braemar is a favorite resort of tourists and artists. See ABERDEENSHIRE, Vol. I, pp. 43, 44.

BRAGA, THEOPHILO, a Portuguese author and scholar, born in San Miguel, Azores, Feb. 24, 1843. He studied at the University of Coimbra, receiving the degree of LL.D. in 1868. He became professor of national economy at the Lyceum of Lisbon, and in 1872 professor of literature in the Faculty Superior of Letters founded by Dom Pedro V. He took an active interest in politics, and was among the foremost of Portuguese republicans. He made his literary *début* as a poet, his compositions being received with favor; among them, *Folhas Verdes* (1859); *A Visão dos Tempos* (1862); *As Tempestades Sonores* (1864). As a positivist philosopher and historian he has published, among other works, *Historia Universal* and *Os Esbocos da Sociologia Descriptiva* (1879–82). He is, however, more distinguished for his works on the history of Portuguese literature, and among his many works in this field his chief one is *Historia da Litteratura Portugueza* (1878). He has also produced a *History of Portuguese Law.*

BRAGANZA, HOUSE OF, the name of the reigning family in Portugal. In 1842, Alfonso, the illegitimate son of John I (who was himself the natural son of Pedro I), was created Duke of Braganza; and in 1640, John, the eighth duke, ascended the throne as John IV, having been called upon to head the revolt by which the Portuguese became independent of Spain. The late emperor of Brazil belonged to the House of Braganza, being the son of John VI of Portugal. See PORTUGAL, Vol. XIX, pp. 543–548.

BRAGG, BRAXTON, an American soldier, born in Warren County, North Carolina, March 22, 1817; died in Galveston, Texas, Sept. 27, 1876. He graduated at West Point in 1837, and served against the Seminoles in Florida. In 1843–44 he was stationed in Fort Moultrie, in Charleston harbor, after which he was sent to Texas. In May, 1846, he was brevetted captain for gallant conduct in defending Fort Brown, Texas, and in June was made captain. He served in the Mexican War; was brevetted major at Monterey in 1846, and lieutenant-colonel at Buena Vista in 1847. In 1856 he resigned from the army and engaged in planting in Louisiana. At the beginning of the Civil War he was appointed brigadier-general in the Confederate army, and placed in command at Pensacola, Florida. In February, 1862, he became major-general in command of the second division of the Confederate army. At the battle of Shiloh, April 6–7, 1862, he commanded the entire Southern forces after the death of Gen. A. S. Johnston, and after the evacuation of Corinth he succeeded General Beauregard in command of the department. In August, 1862, he marched into Kentucky with 45,000 men, and captured Munfordville, but declined to fight with Buell, who recaptured that town. After the battle of Perryville, October 8th, he retreated to Tennessee. He was removed from his command and placed under arrest, but was restored to his division, and fought with Rosecrans at Stone River, at Murfreesboro, Dec. 31, 1862, and Jan. 2, 1863, and was defeated. He encountered Rosecrans again at Chickamauga, Sept. 19–20, 1863, and was victorious. General Grant defeated him at Chattanooga, Nov. 23–25, 1863. In December, General Bragg was relieved from command at his own request, and was later called to Richmond to act as military adviser to Jefferson Davis. In 1864 he led a force to Georgia to operate against General Sherman, but was unsuccessful. After the war he passed his life in retirement, but was at one time chief engineer for the state of Alabama, and superintended the improvements in Mobile Bay. His brother Thomas (1810–72) was governor of North Carolina from 1854 to 1858, United States Senator in 1859, and attorney-general of the Confederacy (1861–63).

BRAGG, EDWARD S., an American soldier and politician; born in Unadilla, New York, Feb. 20, 1827; removed to Fond du Lac, Wisconsin, in 1849, practiced law there, and in 1854 became district attorney. He was commissioned captain, May 5, 1861, fought in the army of the Potomac, and came out of the war a brigadier-general, whose "Iron Brigade" will be long remembered. General Bragg was always a Democrat, and in 1877 served a term in the Wisconsin legislature. In 1878 he was sent to Congress, served by re-election until March, 1883, and was again elected in November, 1884. He has since been defeated for the same seat, and also as a candidate for the United States Senate, February, 1893.

BRAGI, Norse god of poetry. See ÆSIR, Vol. I, p. 211.

BRAHMANS, Hindu caste. See CASTE, Vol. V, p. 188.

BRAHMS, JOHANNES, a German composer; born in Hamburg, May 7, 1833. His father being a musician, Brahms received a thorough musical

education, and at the age of 20 gave such signs of extraordinary powers that Schumann became convinced that he would be the man who would carry on the progressive development of modern music. (See MUSIC, Vol. XVII, p. 97.) In 1861 he removed to Vienna, where he received a warm welcome, and where he consequently took up his residence. No comparison between Brahms and Wagner, the other great modern composer, is possible, as they have occupied different fields of activity. Wagner's fame is entirely founded on his operatic works, while Brahms has devoted himself to choral and chamber music, and is without a rival in these directions.

The genius of Brahms is conservative in spirit, contrary to Wagner and the so-called "school of the future"; he bases his art upon systematic principles of musical form, and it is only in style and construction, and in the character of his ideas, that he differs from other composers. His intellectuality is intense, and will probably prevent his music from becoming popular with the great mass of music-lovers, for he sometimes sacrifices beauty of sound to the more forceful expression of an idea.

Among his later works are *Rinaldo*, a cantata; *Triumphlied; Rhapsodie*, from Goethe's *Hartzreise;* Schiller's *Nänie*, besides string quartettes, symphonies, and a great number of songs, duets and choruses. In 1887 he received from the Emperor of Germany the knighthood of the order *Pour le Merite* for arts and sciences. Died, April 3, 1897.

BRAID, JAMES, born in 1795, in Fife; studied medicine at Edinburgh, and settled as a surgeon in Manchester, where he died, March 25, 1850. He is noted for his researches on animal magnetism, which he named hypnotism. See MAGNETISM, ANIMAL, Vol. XV, p. 278.

BRAIDENTOWN, capital of Manatee County, southern Florida, on the Manatee River. It is connected with the town of Parish on the north, and with Sarasota on the south, by a line of railway built by the Florida, Peninsula and Gulf Railroad Company. In the vicinity are phosphate deposits. The population in the country around is engaged in fruit and vegetable raising. Population 1895, 300.

BRAIDWOOD, a city of Will County, northeastern Illinois, about 20 miles S. of Joliet, on the Chicago and Alton railroad. It is noted for its extensive mines of bituminous coal. Population 1890, 4,641.

BRAIDWOOD, THOMAS, teacher of deaf mutes. See DEAF AND DUMB, Vol. VII, p. 6.

BRAILA OR BRAHILOW. See IBRAILA, Vol. XII, p. 610.

BRAILLE, LOUIS, the inventor of the Braille system of raised letters for the blind, was born near Paris, France, January, 1809. He became blind (the result of accident) at the age of three. In 1819 he became a pupil of the institution for the blind in Paris, and subsequently was elected a professor in the institution. While there he devised a system of points or raised dots, instead of raised lines, for the uses of the blind in reading or writing. See BLIND, READING FOR, in these Supplements.

BRAIN. See PHYSIOLOGY, Vol. XIX, pp. 31–33; and VERTEBRATE BRAIN, THE PRIMITIVE, in these Supplements.

BRAIN, DEVELOPMENT OF. See EMBRYOLOGY, in these Supplements.

BRAIN, OPERATIONS ON. See SURGERY, AMERICAN, in these Supplements.

BRAIN, PRIMITIVE VERTEBRATE, THE. See SEGMENTATION OF THE VERTEBRATE HEAD AND BRAIN, in these Supplements.

BRAINARD, DANIEL; born in Oneida County, New York, May 15, 1812; died in Chicago, Oct. 10, 1866. He was surgeon of the marine hospital in Chicago, and for 23 years occupied the chair of surgery at Rush Medical College, which he assisted in founding.

BRAIN-CORAL, a name commonly applied to several genera of corals in which the skeletons assume a hemispherical shape, but the name particularly applies to the genus *Meandrina*. The serpentine furrows recall the convolutions of the brain. The masses vary in size from a few inches to several feet in diameter.

BRAINERD, capital of Crow Wing County, north-central Minnesota, about 115 miles W. of Duluth. The shops of the Northern Pacific railroad and extensive saw-mills are here located. Population 1890, 5,703; 1895, 7,031.

BRAIN FEVER. See MENINGITIS, Vol. XVI, p. 11.

BRAINTREE, a town of Norfolk County, Massachusetts, noted as the birthplace of John Hancock, John Adams and John Quincy Adams. Its population in 1895 was 5,311.

BRAIZE, a fish (*Spargus pagrus*) allied to the American scup. It is common in England.

BRAKE. The problem of supplying suitable brakes for electric cars has occupied the attention of many engineers during the past decade. Hand-brakes of numerous makes have been used, often with disastrous results in the way of frequent accidents—the natural result of running cars at comparatively high speeds on the same level with pedestrians. Either reduction in speed, improved brakes, or both, have been demanded to increase the safety of the public. Two forms of brake have been introduced to meet this demand —an electrical brake and an air-brake. The Sperry brake is the best known of the former. It takes advantage of the tendency of the car-motor to become a dynamo and generate electricity as soon as it is disconnected from the trolley-wire. The brake proper consists of a flat ring supported from the car-frame. Normally it is kept in inaction by gravity. A coil of wire is imbedded in the brake-ring, and when the motor is disconnected with the trolley a connection is formed with the brake-coil, and the current flowing through magnetizes the ring, and presses it against the inner surface of the wheel. There is thus produced a counter-torque on the axle, a friction on the brake-ring, and heavy Foucault currents are engendered in the car-

wheel. This brake-mechanism is turned on by simply shutting off the trolley current, and when the car comes to a stop, it ceases to act. Its operation is most scientifically accurate, but it has one serious defect—it will not hold a car on a grade, consequently it has to be supplemented by hand-brakes.

The Standard Air-Brake Company of New York have introduced a form of atmospheric brake, patterned after that in use on steam-railways, though possessing several modifications, the principal of which is the introduction of a gearless electric-motor compressor for replenishing the air-supply. By this system trailing cars are supplied with pipes and a brake-cylinder, and are thus controlled automatically from the motor-car. The electric compressors for furnishing air to the reservoirs either encircle the car-axle or are placed under the seats. They do not depend upon the movement of the car-axle, but obtain power from the trolley-current when needed. Another type of compressor is also made, which drives directly from the axle. It is necessary to run the car 100 feet on its first trip for the day before it will accumulate power enough to work.

In stopping a car supplied with this system of air-brakes, the motorman turns a handle slightly to the left and back again; or if there is danger ahead, and a prompt stop is essential, he turns the handle all the way to the left and keeps it there until the stop is effected. The system is in use on several roads where large cars and fast speeds are maintained. C. H. COCHRANE.

BRAKE OR BRACKEN, a name applied in general to a thicket, in particular to any large coarse fern, and especially to *Pteris aquilina*. This fern is one of the most cosmopolitan of plants, covering large areas in dry or rocky regions. It is one of a group of ferns whose sporangia (spore-cases) occur at the margin of the leaf, upon the under side, and are protected by the inrolled edge of the leaf. See FERNS, Vol. IX, p. 103.

BRAMA OR RAY'S BREAM (*Brama rayi*), a bony fish. See BREAM, in these Supplements.

BRAMAH'S PRESS, the hydrostatic or hydraulic press, so named after the inventor, Joseph Bramah. The hydraulic press is a machine by means of which extreme pressure can be applied by the agency of water. The principle upon which it acts is founded upon a fundamental law in hydrostatics; viz., that a non-elastic fluid, such as water, can transmit pressure exerted against it at any point equally in every direction. Presses embodying this principle are used in reducing such materials as wool, cotton, hay, straw, etc., into bales of sizes convenient for easy transportation. The machine consists of two cylinders, one being considerably larger than the other. These are connected by a narrow pipe which enters the larger at the bottom and the smaller at the top. In the larger cylinder is a ram which works vertically through a water-tight collar, exerting pressure upward. In the smaller cylinder is a solid piston or plunger which works upward and downward, like the sucker of a pump. The bottom of this lesser cylinder is connected with a tank, from which water is drawn through a valve, which opens upward when the piston rises in the cylinder. Upon the piston descending, the valve through which the water has been admitted closes, and the water is forced through another valve in the small pipe that connects the two cylinders, the water thus being forced into the larger. With each successive stroke of the piston water is driven into the larger cylinder. The ram is forced to move upward by the pressure exerted, transmitting the force to the table of the press placed over it, thus compressing any substance that has been placed thereon, within the press. Every square inch of the area of the lower end of the ram receives exactly the same pressure upward as may be directed downward on every square inch of sectional area of the plunger; therefore the pressure exerted on the press-table is in proportion to the relative extent of the sectional areas of the plunger and ram. This was the invention of Joseph Bramah; q.v., Vol. IV, p. 213. See also *Applications*, under MECHANICS, Vol. XV, p. 753.

BRAMBLE, a name common to plants of the genus *Rubus;* in England the popular name for common blackberry (*Rubus fruticosus*). See BLACKBERRY, in these Supplements.

BRAMBLING OR MOUNTAIN-FINCH. See FINCH, Vol. IX, p. 193.

BRAMHALL, JOHN, an Anglican churchman; born in Cheshire, England, in 1594, and educated at Sidney-Sussex College, Cambridge. He was already subdean of Ripon, on the way to high preferment, when he went to Ireland as Wentworth's chaplain in 1633. He soon became archdeacon of Meath, and was consecrated bishop of Derry in 1634. (See HOBBES, Vol. XII, p. 36.) On the Restoration he was made archbishop of Armagh (1660), where he died, June 25, 1663.

BRAMWELL, SIR FREDERICK JOSEPH, an English engineer, was born in London in 1818. From his earliest boyhood he showed great interest in mechanics, as evinced by his endeavors to repeat, in a rough model, the steam-engines and winding machinery which he had seen at the age of nine. In 1834 he was apprenticed to John Hague, one of the old school of mechanical engineers, and after a varied experience in the employment of others, in 1853 began business on his own account as a civil engineer. In 1856 he was elected an associate of the Institution of Civil Engineers; in 1862 was transferred to full membership, and in 1884–85 had the honor of filling the position of president. He has also been president of the Institute of Mechanical Engineers, and in 1873 was elected a fellow of the Royal Society. In 1884 he was nominated to the position of chairman of the Executive Council of the Inventions Exhibition which was held in the following year. In 1881 he received the honor of knighthood; in 1888 was president of the British Association for the Advancement of Science; in 1889 was created a baronet. He is a brother of Lord Bramwell; q.v., in these Supplements.

BRAMWELL, JOHN MILNE, a Scotch physician; born in Perth, May 1, 1852. He graduated in medicine at the University of Edinburgh in 1873, and became for several years physician on steamships trading with Brazil. He devoted himself to the study of hypnotism, being a master of the literature on the subject. In 1890 he visited the hospitals at Nancy and La Salpétrière, Paris, at which places he found different methods of treatment. As a result of his study of the methods pursued at these hospitals he combined both methods and used hypnotism more boldly in his practice, treating many cases successfully. He gave a demonstration of hypnotism as an anæsthetic at Leeds, March 28, 1890. Among his publications are *Extraction under Hypnotism; Successful Treatment of Dipsomania, Insomnia, etc., and Various Diseases of Hypnotic Suggestion* (1890–92); and *Alterations in the Special Senses and Induction of Anæsthesia for Operative Purposes by Suggestion in the Apparently Waking State* (1892).

BRAMWELL, LORD, son of George Bramwell, a London banker, and brother of Sir Frederick Bramwell (q.v.), was born in London in 1808. In early youth he was placed in his father's counting-house, where he acquired a practical knowledge of the business of banking. Having studied law, he was called to the bar in 1838. He gradually obtained a large practice, and in 1849 was a member of the commission whose recommendations resulted in the Common-Law Procedure Act of 1852. In 1851 he became a queen's counsel, and was a member of the commission for inquiring into the law of partnership. Differing in opinion with the majority of the commission, he recommended the adoption of a law of limited liability as now existing. In answer to the objection that persons might deal with limited liability companies, believing them to be unlimited, Mr. Bramwell suggested a distinguishing addition to their name as "limited." This advice was adopted and gave great satisfaction. Mr. Bramwell was, in 1856, made a baron of the Exchequer, and received the honor of knighthood. In October, 1876, he was made a judge of the Intermediate Court of Appeal, and sworn of the Privy Council. He retired from the bench at the close of the year 1881, frequently contributing forcible letters to *The Times* on important questions, and always over the pen-name of "B." In February, 1882, he was raised to the peerage by the title of Baron Bramwell. He died May 9, 1892.

BRAN, AS FOOD. Amié Gerard, as the result of his investigations, in 1890, of the alimentary value of the several tissues of which the wheat-grain is composed, asserts, that while a considerable proportion of the seed-coats is digestible in man, the proportion of nutriment is very small, and the quality of the bread is greatly impaired by the presence of these substances. From an economical standpoint, flour mixed with its full complement of bran is not desirable for human food, as the bran can be more profitably utilized as cattle-feed.

BRANCHIOPODA. See CRUSTACEA, Vol. VI, p. 663.

BRANCHIOSTOMA OR LANCELETS. See LANCELET, Vol. XIV, p. 258.

BRANDENBURG, capital of Meade County, northwestern Kentucky, 2½ miles from Weldon or Brandenburg station, on the Louisville, St. Louis and Texas railroad, and 36 miles S.W. of Louisville. There are salt-works in the vicinity. Population 1890, 405; 1895, 495.

BRANDES, CARL EDWARD COHEN, a Danish political writer and dramatist, brother of G. M. Cohen Brandes (q.v., in these Supplements); born at Copenhagen, Oct. 21, 1847. He studied at the university of his native place, showing a partiality for the oriental languages. He was then attracted to politics and the drama, contributing to the press upon these subjects. He was elected to the Folkething in 1889, the president of which considered it incumbent upon himself to ask M. Brandes whether the atheistic views he held would permit him to take the oath. M. Brandes replied, while protesting against the question, that he would take the oath. Among his works are the plays, *A Visit* (1882); *A Betrothal* (1884); *Love* (1887); and *A Politician* (1880); besides which he has published *Danish Dramatic Art* (1880) and *Foreign Dramatic Art* (1880).

BRANDES, GEORG MORRIS COHEN, a Danish literary critic, of Jewish family, brother of Carl Edward Brandes (q.v.); born in Copenhagen, Feb. 4, 1842, and graduated there, at the University, in 1864. Several books on æsthetic and philosophic subjects brought on him a charge of skepticism, which was not removed by an epoch-making series of lectures, delivered before large audiences, and published under the title, *The Great Tendencies of Nineteenth-Century Literature* (1872–75); for his description of the later intellectual position of Europe, as broken away from the orthodoxy and romanticism of the beginning of the century, brought on him the bitter attacks of all the reactionary forces in Denmark. His *Danish Poets*, a masterpiece of psychological analysis, appeared in 1877. The hostility of his enemies induced him, in the same year, to leave Denmark and settle in Berlin, where he published, among other works, *Critical Biographies of Lassalle* (1877), *Esaias Tegnér* (1878), and *Lord Beaconsfield* (1879). A lecture tour through Norway and Denmark brought a powerful party to his side, and in 1882 he returned to Copenhagen, his countrymen having guaranteed him an income of 4,000 crowns, with the one stipulation that he should deliver public lectures on literature. His later works include *The Romantic School in France* (1882) and a biography of *Ludwig Holberg* (1885). See DENMARK, Vol. VII, p. 93.

BRANDT, HERMAN CARL GEORGE, an American philologist, born at Vilsen, Germany, Dec. 15, 1850. Having removed to the United States, he studied at Hamilton College, Clinton, New York, in 1872, and thence proceeded to Auburn Theological Seminary, completing his studies in Göttingen and other continental universities. On

his return to America he was for a time associate professor at Johns Hopkins University, and then was appointed, in 1882, to the chair of French, German and philology in Hamilton College. Among his educational publications are *German Grammar for High Schools and Colleges* (6th ed., 1892), and a *German Reader* (3d ed., 1892).

BRANDYWINE, BATTLE OF THE (1777). See UNITED STATES, Vol. XXIII, p. 742.

BRANFORD, a town in New Haven County, southern Connecticut, on Long Island Sound, and the New York, New Haven and Hartford railroad, 7 miles S.E. from New Haven and 81 N.E. from New York City. It is situated on Branford Brook, and has a harbor for small craft, the place being a summer resort. It manufactures locks and malleable iron articles. Population 1890, 4,460.

BRANK OR BRANKS, an instrument formerly used for the punishment of scolds in England and Scotland, and often, in the former country, called "the scold's bridle," or "gossip's bridle." When the brank first came into use is unknown, but it is found at Edinburgh as early as 1567. According to Mr. Llewellynn Jewitt it was never a legalized instrument of punishment, although corporations and lords of the manor in England, and town councils, kirk sessions and barony courts in Scotland, exercised the right of inflicting such punishment. Men were put in the stocks or pillory, women in the branks, for such petty misdemeanors as are now termed breaches of the peace, using abusive, insulting or threatening language, cursing and swearing, and contumacy.

The brank in its simplest form is a hoop of iron opening by hinges at the side, so as to inclose the head, and fastened by a staple with a padlock at the back; a plate within the front of the hoop projecting inwards, so as to fit into the mouth of the culprit, and by pressing upon the tongue, be an effectual gag. The brank was used at Longholm, in Dumfriesshire, in 1772; at Morpeth in 1741; it was used at a later date at Manchester and at Macclesfield; and at Bolton-le-Moors in 1856 the iron bridle was stated to be "not many years since in use" for the correction of immorality. Brank was at one time a common name in Scotland for any sort of bridle, and the word is so used by Burns.

BRANT, JOSEPH, an Indian chief, known as Thayendanega; born in Ohio about 1742; died near Lake Ontario, Nov. 24, 1807. It is thought that he was a grandson of one of the five Indian kings who visited England in 1711, and who were mentioned by Addison in the *Spectator*. At the age of 13 he accompanied his two elder brothers, who, under the Mohawk king Hendrick, participated in Sir William Johnson's campaign against the French at Lake George. He was sent to the Indian school at Lebanon, Connecticut, became interpreter to a missionary in 1772, and was frequently employed by Sir William Johnson as an agent among various tribes. On the death of Sir William, he became secretary to his son-in-law, Colonel Guy Johnson. During the Revolution the Mohawks adhered to the British, and Brant went to England, where he had access to the nobility, and his portrait was painted by Romney. In 1776 he returned to Canada, and received a commission in the British army, in which he attained the rank of colonel. He participated in the battle of Oriskany, Aug. 6, 1777, and led the Indians in many raids on the borders of New York; but he was not present at the massacre of Wyoming. In revenge for the destruction of Newtown (near Elmira) by General Sullivan in 1779, Brant laid waste the Mohawk valley with 300 Indians and Tories. After the war the Six Nations found that they had no mention in the treaty, and Brant asked for a tract of land on the north shore of Lake Erie, which was granted. He visited England again in 1785, raised funds to build a church, and received compensation to repair the losses his nation had incurred in supporting the English. In 1791 he was present at the defeat of General Arthur St. Clair on the Miami River. In his late years he was troubled with efforts made to drive the Mohawks from their settlement, and by conspiracies, in which Red Jacket was conspicuous. Later he visited the United States, but those who had suffered from his raids feared and hated him, and his life was often threatened. His youngest son, John, became a chief, and took part in the war of 1812.

BRASHEAR, a town in Louisiana, now named MORGAN CITY; q.v., in these Supplements.

BRASSEUR DE BOURBOURG, CHARLES ETIENNE, a French archæologist; born in Bourbourg, Sept. 8, 1814. From 1845 until 1848 he was a priest in the United States and Canada, and from 1848 until 1851 was chaplain to the French legation in Mexico. He traveled in Mexico and also in Central America, and made a special study of the people, language and antiquities of the countries he visited. In 1864 he was archæologist to the French expedition into Mexico. Among his works are a *History of Canada* (1851); *History of the Civilized Nations of Mexico and Central America* (1857). He died at Nice, Jan. 8, 1874.

BRASSEY, THOMAS, BARON, son of the great railway contractor, Thomas Brassey, whose *Life* was written by Sir Arthur Helps (1872). He was born at Stafford, England, in 1836. He was elected to Parliament for Devonport in 1865, and afterward represented Hastings (1868–86). As Civil Lord of the Admiralty (1880), and Secretary (1884), his influence was felt in naval questions, and he published several works on seamanship and naval affairs. He was made K.C.B. in 1880, and was raised to the peerage in 1886. He is a veteran yachtman; and Lady Brassey's pleasant records of their yacht voyage round the world in 1876–77, and of succeeding trips of the *Sunbeam*, were widely popular. She died on the homeward voyage from Australia, Sept. 14, 1887, and was buried at sea. Lord Brassey is author of *Work and Wages* (1872), *British Seamen* (1877), *The Eastern Question* (1878),

*Foreign Work and English Wages* (1879), and *The British Navy*. Lord Brassey married again in 1890.

BRASSICA, the turnip and cabbage genus of *Cruciferæ*, containing about 100 species, all natives of Europe and northern Asia. *Brassica oleracea* gave rise to all the forms of cabbage; q.v., Vol. IV, p. 617. *Brassica campestris* (see HORTICULTURE, Vol. XII, p. 288) is the source of the turnip and the rutabaga. *Brassica alba* and *Brassica nigra* are the white and black mustards. See MUSTARD, Vol. XVII, p. 112.

BRATHWAITE, RICHARD, an English minor poet; born in Westmoreland, about 1588; died near Richmond, in Yorkshire, in 1673. He entered Oriel College, Oxford, at 16; passed afterward to Cambridge and thence to London, where he devoted himself to poetry and playwriting. In 1611 he published *The Golden Fleece*, a collection of poems, and in 1614 three works, one of them a book of pastorals entitled *The Poet's Willow*. In 1615 he published the collection of satires, *A Strappado for the Devil*, in imitation of *The Abuses Whipt and Stript* of George Wither. The latter part of his life was spent in Westmoreland and Yorkshire, where he lived the life of a country gentleman, without, however, ceasing his literary activity. Of his numerous books the most noteworthy one is *Barnabæ Itinerarium*, or *Barnabee's Journal*, published in 1638, and often reprinted under the title of *Drunken Barnaby's Four Journeys*. This lively book, in rhymed Latin and doggerel English verse, was popular in the eighteenth century, and had the honor of an eleventh edition in 1876.

BRATIANO, JEAN, a Roumanian statesman; born at Bucharest in 1821. After serving a short time in the Servian army, he went, in 1841, to Paris and studied at the Collége de France and the École Polytechnique. He fought with his brother Demetrio in the revolution of February, 1848. Next year he returned to Roumania, and was appointed a secretary to the provisional government. He became a leader of the party which aimed to free Roumania from the Turkish yoke and preserve the state free from Russian domination. During the revolution he was Minister of Police, but was proscribed, with his brother, on the intervention of Russia, and returned to Paris, where, in 1855, he published a *Memoir on the Austrian Empire in the Eastern Question*, and two years later a *Memoir on the Situation of Moldo-Wallachia after the Treaty of Paris*. In the same year he and his brother returned to Bucharest, and they were elected deputies in the Provisional Assembly, each becoming noted as an orator. In 1876 Jean became President of the Council and Minister of Finance, exchanging this portfolio for that of Minister of the Interior. He announced the Declaration of the Independance of Roumania, May 21, 1877, but was forced into an alliance with Russia and war against Turkey. He presided over the affairs of Roumania for 12 years, with an intermission of a few months in 1881, when his brother held the premiership, and in which year Roumania was erected into a kingdom. In 1886 an attempt was made upon his life, the cause not being apparent, and in 1888 he was overthrown by a coalition of parties, and died at Bucharest, May 16, 1891. His brother, Demetrio, died at the same place, June 20, 1892.

BRATTLEBORO, a town of Wyndham County, southern Vermont, on the Connecticut River and Central Vermont railroads, about 80 miles S. of Rutland. It is the seat of the Vermont Asylum for the Insane. It is an important center of trade, and contains extensive manufactories of organs, machinery, furniture and carriages. Rudyard Kipling, the noted Anglo-Indian author (q.v., in these Supplements), resides here. Population 1890, 5,467.

BRAUN, ALEXANDER; born at Ratisbon, Bavaria, in 1805; professor of botany at Berlin from 1852 till his death, March 29, 1877. He did special service in the departments of the morphology of plants, systematization and the lower cryptogams. See MORPHOLOGY, Vol. XVI, p. 841.

BRAUN, AUGUST EMIL, archæologist; born at Gotha in 1809; died in Rome, Sept. 12, 1856. He studied at Göttingen and Munich, and in 1833 went to Rome, where in a short time he was made secretary to the Archæological Institute. He wrote many valuable works on art and mythology in German and Italian. Of these the most important are his *Vorschule der Kunstmythologie* (1854); and an admirable guide-book, *Die Ruinen und Museen Roms* (1854); both of which have been translated into English.

BRAUN, CHARLES, a German political economist; born at Hadamar, Nassau, March 22, 1822. He took a course of language at Marburg, and studied law and political economy at Göttingen. He entered the magistracy of the duchy of Nassau in 1844, but on account of his political tendencies retired from his office and became an advocate. Having taken a prominent part in bringing about the union of Nassau with Prussia, he went to Berlin and entered the bar. He was elected to the legislative bodies of Nassau, Prussia and Germany, and in 1871 to the Reichstag, becoming a leader of the National Liberal party, which he left in 1880 to support the free trade party, to work against the protectionist designs of Bismarck. He was the first president of the Congress of Political Economists, founded in 1858. Among M. Braun's miscellaneous works are *Pictures from the Small German States*, the first series of which appeared at Leipsic in 1869, the work having great success; *During the War: Narratives, Sketches and Studies* (1871); *Travels in Turkey* (1876–78); *The Diamond Duke*, a satire upon the Duke of Brunswick (1882); and *From Frederick the Great to Prince Bismarck* (1882).

BRAWLING IN CHURCHES, in English law, was an old statutory offense in the ecclesiastical courts. If it were committed by words only, the bishop might exclude a lay offender from church, and might suspend a priest. In more serious cases excommunication and branding were the punishment. Anglican priests may still be pun-

ished for such conduct by their own courts; but the riotous, violent or indecent conduct of laymen in any place used for religious worship is dealt with by the ordinary criminal courts. See NONCONFORMITY, Vol. XVII, p. 533.

BRAXTON, CARTER, a signer of the Declaration of Independence; born in Newington, King and Queen County, Virginia, Sept. 10, 1736; died in Richmond, Virginia, Oct. 10, 1797. He inherited a large estate, and was educated at William and Mary College. In 1761 he entered the house of burgesses, and remained in the public service until his death. He supported Patrick Henry's stamp-act resolutions, and favored independence. He was a member of the last house of burgesses; of the general convention at Richmond (July 17, 1775) which organized the militia; and in December, 1775, when the president of the Continental Congress died, Mr. Braxton was chosen for the office. He signed the Declaration of Independence, July 4, 1776. In 1777, 1779, 1780, 1781, 1783 and 1785 he was a member of the house of delegates. In 1786 he was chosen to the council of state; in 1791 he was elected to the legislature; and from 1793 until his death he served as a member of the executive council of the general assembly.

BRAXTON COURTHOUSE OR SUTTON, capital of Braxton County, central West Virginia, on the Elk River, and at the terminus of the West Virginia and Pittsburg railroad, 56 miles N.E. of Charleston. It has a saw-mill industry. Population 1890, 276.

BRAY, ANNA ELIZA (*née* Kempe), an English authoress; born in London, Dec. 25, 1790; died there, Jan. 21, 1883. She studied for the stage, but in 1818 married the artist Charles Alfred Stothard. (See STOTHARD, Vol. XXII, p. 578.) In 1825 she married the Rev. E. A. Bray, vicar of Tavistock, and after his death in 1857, settled in London. Between 1820 and 1874 she published a score of romances, books of travel and other works, the best being *The Borders of the Tamar and the Tavy* (1836); *Life of Thomas Stothard, R.A.* (1851); and *A Peep at the Pixies* (1854).

BRAZIL, UNITED STATES OF, a republic of central South America. For a general description and early history, etc., see BRAZIL, Vol. IV, pp. 221–240.

The imperial dynasty continued until Nov. 15, 1889, when, with remarkable unanimity by the principal citizens in the national capital, a declaration was adopted in favor of a republic, and a provisional government assumed control. The revolution was sudden and bloodless. The Emperor was looked upon as a harmless personage, but as one having good intentions and patriotic purposes toward the people. He was therefore kindly treated, and generous provision was made for his support. Lest his presence should open the door for trouble during the reorganization of the government, he was transferred to his kindred in Portugal. Dom Pedro died in 1891.

The preference of the people was for a republic formed on the American model. The draft of the new constitution was promulgated June 23, 1890, under the provisional presidency of Marshal Deodoro da Fonseca. There was no serious trouble in the administration—everything went on as usual; the imperial officials became republicans; most of the ambassadors to foreign courts continued at their posts; only a few important changes were made.

The provisional government soon began high-handed proceedings of the most audacious character. The governments of the great cities and of the provinces were abolished, and reconstructed to suit Fonseca and his friends. Prominent republicans were banished. The standing army was almost doubled. The foreign cable and home press were muzzled. Indeed, these self-constituted authorities were about to foist a constitution on the people, *nolens volens*, and were only brought to a halt in their mad career by the refusal of England and the United States to recognize such a constitution. Thereupon the people were allowed to elect members to a constitutional convention which finally accepted the articles.

In the mean time, Señor Barbosa, the Minister of Finance under the provisional government, had been granting to three great hypothecary banks absolutely monopolistic powers, which began a wild orgy of cheap paper money, ending as such orgies always, in the history of man, have ended.

The chief feature of the constitution, adopted finally in February, 1891, was the establishment of the old provinces as states, self-governed except for federal purposes. The federal government consists of a National Congress, composed of a Senate and a Chamber, which meet annually, May 3d, for a four months' session, Deputies and Senators being paid. The Deputies are elected directly, provision being made for minority representation; their term is three years, one member being chosen for every 70,000 of the population. The Senators are elected by the state legislatures, three for each state, and for a term of nine years —three retiring every three years. The President, in whose hands is the executive authority, is elected directly.

In the early fall of 1891 Congress began to turn its attention toward restraining the unmanageable Fonseca. The President promptly accepted the challenge, and thereupon began a pitched battle, which the dictator brought to a climax on Nov. 3, 1891. He dissolved the National Congress, Rio Janeiro was declared to be in a state of siege, and he was making active preparations to put down the uprising in the disaffected province of Rio Grande do Sul when the officers of the army and navy, with a sudden access of patriotism, demanded his resignation. The Vice-President, Floriana Peixoto, succeeded to the chief magistracy, and filled the office with dignity. He was a brave and strong-handed ruler, and, though constantly grappling with revolt, did much to advance Brazil. He was succeeded (November, 1894) by Prudento J. De Moraes.

The chief event succeeding the election of

De Moraes was the termination of the civil war, by the defeat, by Marshal Peixoto, the ex-President, of Admiral de Mello at Rio Grande, April 13, 1894, and of Admiral da Gama at Cuareim, June 26, 1895. The latter shortly afterwards committed suicide; on June 30th, Peixoto died, and was given a public funeral. A full amnesty was eventually granted to the insurgents, Oct. 21, 1895.

The only event of foreign interest of recent happening was the trouble with Admiral da Gama, the insurgent commander of the fleet left at Rio, who attempted to prevent American vessels from approaching the landing-stage to discharge their cargoes. The American commander, Admiral A. E. K. Benham, stated his intention to prevent deliberate firing upon trading-vessels, even to the extent of sinking the insurgent gunboats if necessary. Another incident related to the excitement that arose in July, 1895, over the British occupation of the island of Trinidad, which was claimed as Brazilian.

The capital is Rio de Janeiro, with a population of 522,651 in 1890. But there is an article in the constitution which provides that at some future time the capital shall be built on the central plateau of Brazil. The choice of the exact location has not yet been decided. The other important cities are Bahia, 200,000, and Pernambuco, 190,000. There is no state church, all forms of worship being allowed, but the Roman Catholic prevails. Slavery was abolished, May 13, 1888. According to the census of 1890, so far as ascertainable, the population was 14,068,268, but other figures put the population at 20,000,000. Of this number the whites and metis, each about equal, constituted about half, the negroes over a seventh, the balance being Indians. In 1894 there were 63,294 immigrants, mostly Italian and Portuguese. Brazil is an agricultural country, though but a small fraction of its soil has been brought under culture. Coffee is the chief product cultivated, the annual yield being estimated at 8,000,000 bags; next is sugar, with a product of 460,000 bags. There are numerous central sugar factories, with government guaranty of interest at six or seven per cent. Both the forests and mines of Brazil are of value, but little has been done to make use of them. Vast quantities of iron are known to exist, but they cannot be worked, for want of fuel. Diamond-mining is also prosecuted. There are 17,000,000 head of cattle, the number killed in Rio Grande do Sul in 1895 being 280,000. Cotton-mills are on the increase; there were in the state of Rio de Janeiro, in 1894, 15 mills, manufacturing annually goods of the value of $7,500,000, while in Bahia there were 10 mills. Pernambuco has eight cotton and jute mills. Petropolis has a silk-mill. Rio de Janeiro has two flouring-mills, with a capacity of 60,000 tons annually.

The exports of Brazil go mainly to the United States and Great Britain, to the extent of about one third each; Germany and France coming in after with about one tenth each. In the imports into Brazil, Great Britain leads all countries, her share being 45 per cent, France coming next with 17 per cent. The pincipal articles imported are, in the order of their value, cotton goods, wines and spirits, preserved meat and fish, woolen goods, farinaceous food, coal, linen goods, iron and steel. The revenue for 1894–95 was $45,000,000; expenditure, $150,000,000; the imports amounted to $60,000,000; the exports, $55,000,000. The total indebtedness, according to the latest official statement, was somewhat over $445,000,000. The chief exports are coffee, cocoa, rubber, sugar, cotton, cottonseed, dried beef, tallow and hides. The money in circulation is almost entirely paper currency based upon the gold standard, the unit being the milreis, equivalent to $0.54.6 American money. The bank-note issue (March, 1895) amounted to 340,714,000 milreis, and the total paper money to 708,073,000 milreis. The decree of March 14, 1895, required that half the liquid proceeds of the internal loan of 100,000,000 milreis should be withdrawn at once, and that the gradual redemption of notes should begin on April 30th.

Brazil possesses railways of a total length of 7,492 English miles open for traffic in 1895, besides having 4,321 miles in process of construction, 6,064 under survey, and 8,091 to be surveyed. Most of the railways have been constructed with the guaranty of the interest (mostly six and seven per cent) on the capital by the government. The total cost of all the lines up to 1894 has been 257,674,937 milreis. The total receipts of the state railways alone in 1891 amounted to 21,733,383 milreis, and expenses to 14,229,521 milreis, but these expenses consisted only of employees' salaries. The telegraph system of the country is under the control of the government. In 1893 there were 9,884 miles of line and 21,130 miles of wire. There were 264 telegraph-offices. In 1890 there were 1,132,432 messages. The receipts were 3,527,000 milreis; expenses and cost of construction, 6,088,000 milreis. The post-office carried, of letters, 33,441,000, and of printed matter, 37,674,000 packages, in 1893.

Public education is divided into three distinct classes—namely, primary, secondary or preparatory, and scientific or superior. The higher education is controlled by the central government, which maintains two schools of medicine, two of law, four military and one naval school, a school of mines and a polytechnic. In 1890 these schools had, in all, 2,916 pupils. There are, besides, the Lyceum of Arts and Trades, with 2,277 pupils, and five other special schools, with 575 pupils. Connected with the observatory at Rio is a school for astronomy and engineering. Secondary instruction is under the charge of the provincial governments, except in the capital. In most of the chief towns of the states there is a middle-class school and a normal school, besides many private middle-class schools. Primary instruction in the capital is under the charge of the government, and under the municipal and state authorities in the states. According to the constitution, education is, at all stages, under lay man-

agement, and primary education is gratuitous. Compulsory education now exists in several states. In 1889 there were, it was officially stated, 7,500 public and private primary schools, attended by 300,000 pupils in all.

Obligatory service in the army was introduced by Brazil in 1875. The duration of service is six years in the active army and three in the reserve. In 1895 there were 4,000 officers and 29,000 men, besides 20,000 gendarmes. The Brazilian navy consists of the second-class battleship *Riachuelo* (5,700 tons); *24 do Maio* (4,950 tons); *Bahia* (1,000 tons); 5 river monitors (of from 340 to 470 tons each); the second-class cruisers *Almirante Tamandare* (4,735 tons, built in Brazil in 1890); and *Benjamin Constant* (2,750 tons); besides gunboats, torpedoes and small vedette craft. Three powerful new cruisers have been ordered, besides two coast-guard iron-plated vessels and three torpedo-catchers. For these 18,000,000 milreis have been voted. There are 5 naval arsenals: Rio de Janeiro, Para (Belem). Pernambuco, Bahia and Ladario do Matto Grosso,

BRAZIL, capital of Clay County, central western Indiana; it is a railroad center, situated about 15 miles E. of Terre Haute. It contains extensive manufactories of pig-iron, and in its vicinity are numerous mines of block coal. There are also manufactories of boilers, terra-cotta and pottery. Population 1890, 5,905.

BRAZILIAN CABBAGE, a name given to various species of *Calidium* and *Colocasia*, of the family *Araceæ*, allied to the *Arum* and *Cocco*. *Calidium sagittifolium*, as its name implies, is peculiar in having arrow-shaped, pointed leaves. Supposed to have been originally a native of the American tropics, it is now cultivated generally throughout the tropics. It yields an edible tuber, while the leaves are also used as greens. Both the root and leaves are destitute of the acridity generally characteristic of the order.

BRAZILIAN GRASS, a name sometimes given to the material used in chip hats, which is really the leaves of *Chamærops argentea*, a Cuban palm.

BRAZORIA, capital of Brazos County, southern Texas, on the Brazos River, about 20 miles from its mouth, which opens into the Gulf of Mexico. The town is about 6 miles S. of Columbia, on the International and Great Northern railroad, and 60 miles S.W. of Galveston. The river is navigable by steamboats below Brazoria. The place has a college, and its population in 1890 was 432.

BRAZOS, one of the great rivers of Texas. Nearly 900 miles long, it flows E. and S.E. into the Gulf of Mexico. During the winter, or flood season, it is navigable for some 300 miles, and fertilizes vast tracts of lowlands. See TEXAS, Vol. XXIII, p. 203.

BRAZZA, PIERRE SAVORGNAN DE, an African explorer, born at Rome in 1852. He studied at Paris, entered the French navy in 1870, and served in Africa, on the Gaboon station. In 1876–78 he made a famous exploration of the Ogoway and of some of the northern tributaries of the Congo. In 1878 the French government gave him 100,000 francs for exploration of the country of the Congo, where he secured vast tracts of land for France and founded several stations, that called Brazzaville being on the northern shore of Stanley Pool. In 1883 he returned to extend the territory secured to France, this time with a government grant of 1,275,000 francs, besides stores and provisions of all kinds, and by the end of 1885 he had established 26 stations, of which Franceville was the chief. The securing for France of her great dependency in Africa lying between the Gaboon and the Congo is mainly his work, and of that dependency he was made governor in 1886.

BREACH OF PROMISE, as a legal term, signifies the failure of one of the parties to a contract of marriage to carry out the agreement or promise. Where such contract is broken by either party, the other has a right of action for the recovery of such damages as may be shown to result from such breach, but an action to enforce the specific performance of such contract cannot be maintained. The requisites of a contract of marriage, to render it enforceable at law, are the same as other contracts. There must be an offer of marriage and acceptance, but such offer and acceptance need not be expressly made if it appear that both parties understood that a contract existed. The mutual promise is a sufficient consideration. A party must be of lawful age to enter into a contract before he will be bound by a contract of marriage, and such contract will not bind one who is under age, even if of sufficient age to marry. The contract must also be one which can lawfully exist. A contract between those of such relation to each other as to make marriage illegal, as nephew and aunt, or where one of the parties is at the time married, is not valid. But where one of the parties to a contract of marriage is incompetent to make such contract, and knew of his incompetency, he is liable in an action for deceit, though his promise is void. In actions for damages for breach of promise to marry, the measure of damages is not governed by the rules applicable to simple contracts, but rests in the sound discretion of the jury, under the circumstances of each particular case, and the courts, to discourage the breach of contracts of this character, permit exemplary or extraordinary damages to be awarded. See WOMEN, Vol. XXIV, p. 643.

BREAD. See BAKING, Vol. III, pp. 250–258.

BREADNUT, the fruit of the tree *Brosimum Alicastrum*, family *Urticaceæ*, a native of Jamaica, closely allied to the breadfruit. The breadnut tree is dicœcious, with ovate-lanceolate evergreen leaves, and abounds in a tenacious gummy milk. Its leaves and young shoots are eaten by cattle, but deleterious qualities are said to be developed in them as they become old. The fruit is a one-seeded drupe, and the kernels, boiled or roasted, form an agreeable article of food, and are eaten instead of bread. Their taste resembles that of hazelnuts. Another species, *Brosimum Galacto-*

*dendron*, is the cow-tree of South America. *Brosimum Aubletii* of British Guiana and Trinidad yields heart-wood of a deep mottled brown, hence called letter-wood, snake-wood, or leopard-wood. It is chiefly used for veneering. See NUT, Vol. XVII, p. 664.

BREAKSPEAR, NICHOLAS, the only Englishman who ever became pope. See ADRIAN IV, Vol. I, p. 165.

BRÉAL, MICHEL JULES ALFRED, a French philologist; was born at Landau, Bavaria, of French parentage, March 26, 1832. He received his early education in France, and studied Sanskrit in Germany under Bopp and Weber. Returning to Paris, he joined the staff at the Bibliothèque Impériale, and in 1862 obtained the Academy's prize for his *L'Étude des Origines de la Religion Zoroastrienne* (1862). In 1864 he was made professor of comparative grammar at the College of France. M. Bréal was elected a member of the Institute, Dec. 3, 1875. In 1890 he was made commander of the Legion of Honor. Among his works are *Hercule et Cacus, Étude de Mythologie Comparée* (1863); *Des Noms Perses chez les Écrivains Grecs* (1863); *Le Mythe d'Œdipe* (1863); *Mélanges de Mythologie et de Linguistique* (1877); *Sur le Déchiffrement des Inscriptions Cypriotes* (1877); *Leçons de Mots* (1881); and *La Réforme de l'Orthographe Française* (1890). He also published a translation of Bopp's great comparative grammar of the Indo-European languages, which appeared in four volumes from 1867 to 1872.

BREAM, a fresh-water fish, nearly allied to the bleak. (See ANGLING, Vol. II, p. 42). Quite distinct from these is the large family of sea-breams, or *Sparidæ*, represented in England by the species *Sparus, Pagrus, Pagellus* and *Cantharus*, and in the United States by *Logodon rhomboides*, the sailor's choice, and *Diplodus holbrooki*, the pinfish. The term *bream* is also applied to *Brama Rayi*, or Ray's bream or pomfret, a bony fish found along the coast of North and South America. See ICHTHYOLOGY, Vol. XII, p. 688.

BREASTPLATE, also called *breastplate of judgment*, an ornament worn by the Jewish high priest. (See GEMS, Vol. X, p. 138.) In ancient armor it was a plate of iron, steel or other metal, so fastened as to protect the chest of the wearer. See CUIRASS, Vol. VI, p. 692.

BREASTS, MINING. See COAL-MINING IN THE UNITED STATES, in these Supplements.

BREAST-WHEEL. See HYDROMECHANICS, Vol. XII, p. 522.

BRECCIA, in geology, a term adopted from the Italian to designate a conglomerate in which the fragments are angular instead of being rounded. (See GEOLOGY, Vol. X, p. 237.) The term is most commonly applied to masses composed of such fragments as have become cemented together before being rounded by friction. Bones and fragments of bones cemented together by calcareous matter often occur upon the floors of caves in limestone; these accumulations are termed *bone breccia*.

BRECK, JAMES LLOYD, an American religious writer; born at Philadelphia, June 27, 1818. He graduated at the University of Pennsylvania in 1838, and at the General Theological Seminary, New York, in 1841. He engaged in frontier mission-work, first in Wisconsin and then in Minnesota, founding in the latter state a mission at Crow Wing, among the Chippewas, in 1850, and in 1858 he established the church schools at Faribault. In 1867 he went to California, prosecuting his philanthropic efforts, and died there, at Benicia, March 30, 1876. He published in 1863 *A Communication on Parish Sisterhoods*, and *Disciplines, Instructive and Devotional, to be Used in Preparation for Baptism, Confirmation and the Communion*.

BRECKENRIDGE, capital of Summit County, west-central Colorado, situated on Blue River, on the western slope of the Rocky Mountains, and on the Denver, Leadville and Gunnison railroad, about 20 miles N.E. of Leadville. Its history is coincident with that of the latter city. The surrounding country was one of the rich and populous placer-mining diggings of 1859–60; it is now a leading producer of silver, copper and lead, as well as gold, and contains numerous smelters, mills and sampling-works. Population 1890, 714; 1895, 3,005.

BRECKENRIDGE, capital of Wilkin County, on the western frontier of Minnesota, on the Red River of the North, where that river is joined by the Bois de Sioux River. The Great Northern and the Northern Pacific railroads intersect here. To this place steamboats ascend the Red River, and from here goods are transported by the river to Winnipeg. Population 1890, 808.

BRECKENRIDGE, capital of Stephens County, north-central Texas. Population 1890, 462.

BRECKENRIDGE, CLIFTON R., an American statesman; born in Lexington, Kentucky, Nov. 22, 1846, being the son of the late Hon. J. C. Breckenridge (q.v., in these Supplements). He served in the Confederate army as a volunteer, and at the close of the war was a midshipman on duty below Richmond, Virginia. He attended Washington College, now Washington and Lee University, Virginia; and moving to Arkansas, became a cotton-planter in 1870. He sat in the Forty-eighth to the Fifty-third Congresses, and resigned in 1894 to accept the appointment of minister to Russia, succeeding Andrew D. White, in May, 1896. In his official capacity he was present at the ceremonies connected with the coronation of the Czar, Nicholas II.

BRECKENRIDGE, JOHN, an American clergyman; born at Cabell's Dale, Lexington, Kentucky, July 4, 1797; died there, Aug. 4, 1841. He was graduated at Princeton (1818), was licensed to preach (1882), was chaplain to Congress (1822–23), and pastor of a church in Lexington (1823–27), when he began the publication of a religious journal called the *Western Luminary*. In 1831 he was appointed secretary and general agent of the board of education of the Presbyterian Church, and five years later he was called to the chair of theology at Princeton. He engaged in a journalistic controversy with Archbishop Hughes on the question, "Is the Roman Catholic Religion in any

or all of its Principles or Doctrines Inimical to Civil or Religious Liberty?" Mr. Breckenridge was a keen debater and controversalist, upheld old-school doctrine, and was the author of numerous polemical writings. Excessive work caused his death just after he was called to be president of Oglethorpe University, in Georgia.

BRECKENRIDGE, JOHN CABELL, Vice-President of the United States; born near Lexington, Kentucky, Jan. 21, 1821; died in Lexington, May 17, 1875. His grandfather was a United States Senator and Attorney-General. He was educated at Center College, Danville, and at the Transylvania Institute, and then practiced law in Lexington. He served in the Mexican war, and on his return was sent to the legislature and to Congress (1851–53). He was elected to the Vice-Presidency when Mr. Buchanan became President. At the conclusion of his term of office he was nominated (1860) for the Presidency by the Southern delegates to the Democratic convention; Northern delegates at the same time nominating Stephen A. Douglas. Mr. Lincoln was elected, receiving 180 votes in the electoral college against 72 in favor of Breckenridge. In 1861 he became United States Senator and defended the Confederate cause in that body. He joined the rebel troops in the same year, and was expelled from Congress. He was at the battles of Shiloh, Baton Rouge, Murfreesboro, Chickamauga, Chattanooga, Cold Harbor, and in other engagements. In 1865 he was Confederate secretary of war. At the close of the war he escaped to Florida Keys, thence to Cuba, and to Europe. Returning in 1868, he devoted himself to his profession. He was the youngest man ever elected to the office of Vice-President, being at that time 35 years old.



JOHN C. BRECKENRIDGE.

BRECKENRIDGE, ROBERT JEFFERSON, clergyman; born in Cabell's Dale, Kentucky, March 8, 1800; died in Danville, Kentucky, Dec. 27, 1871. He studied at Princeton, Yale and Union colleges, and graduated at the latter in 1819. He read law, and practiced in his native state for eight years. Four years he sat in the legislature, then he abandoned politics and began the private study of theology. His first pastorate was at the Second Presbyterian Church in Baltimore, where he remained 13 years. He became president of Jefferson College, Pennsylvania (1845); then was chosen (1847) superintendent of public instruction for Kentucky, whither he had removed in the same year. The new theological seminary of Danville called him in 1853 to the chair of didactic and polemic theology. He was an eminent theological disputant, and in politics was anti-slavery and intensely loyal. He wrote *Travels in Europe* (1839); *Papism in the Nineteenth Century in the United States* (1841); *The Knowledge of God Objectively Considered* (1857); and *The Knowledge of God Subjectively Considered* (1859).

BRECKENRIDGE, WILLIAM CAMPBELL PRESTON, an American Congressman; born at Baltimore, Maryland, Aug. 28, 1837. He studied at Center College, Danville, Kentucky, graduating in 1855; adopted the legal profession, graduating in law at the University of Louisville, Kentucky, 1857, and afterwards became professor of equity jurisprudence in Cumberland University, Lebanon, Tennessee. He served in the Confederate army, being colonel of the Ninth Kentucky cavalry. He was elected as a Democrat to the Forty-ninth, Fiftieth, Fifty-first, Fifty-second and Fifty-third Congresses. He was defeated for the Fifty-fourth Congress, the contest being embittered by personalities that arose in connection with a breach of promise suit instituted against him.

BRECKNOCK OR BRECON, a city of South Wales. See BRECON, Vol. IV, p. 244.

BREDERODE, HENRY, COUNT OF, born in Brussels, December, 1531. He was a leader of the disaffected nobility in the struggle against Spain. He drew up the "Compromise" of 1566, and headed the deputation to which the name *Gueux* (see HOLLAND, Vol. XII, p. 74) was first applied. He was active in organizing the fraternity, but the failure of an attempt in the following year to raise an armed revolt in Amsterdam obliged him to flee to Germany, where he died, at Recklinghausen, Aug. 24, 1568.

BREDERÔO, GERBRAND ADRIAANSSEN, a celebrated Dutch poet and dramatist, a contemporary of Ben Jonson. See HOLLAND, Vol. XII, p. 94.

BREE, MATTHIAS IGNATIUS VAN, a Flemish painter, was born at Antwerp in 1773; died Dec. 15, 1839. In 1797 his *Death of Cato* gained for him the *Prix de Rome*, which entitled him to study in Italy. On his return to Antwerp in 1804, he became director of the Academy of Fine Arts. His chief works are the *Entrance of Napoleon into Antwerp*, the *Death of Rubens*, in the Antwerp Museum, and *Patriotism of the Burgomaster at the Siege of Leyden, 1576*, in the town-house of Leyden.

BREECHES BIBLE. See ENGLISH BIBLE, Vol, VIII, p. 387, note.

BREECH MECHANISM. See GUNMAKING, in these Supplements.

BREESE, SIDNEY (1800–78). An American jurist. He was admitted to the bar of Illinois in 1821; became assistant secretary of state, served in the Black Hawk war, was elected circuit judge in 1835, and supreme court judge in 1841. From 1843 to 1849 he served as United States Senator. He was an earnest advocate of a transcontinental railroad to the Pacific. In 1857 he was again elected justice of the supreme court. In 1873 he was made chief justice, and held that post until his death. He published a valuable *History of the Pacific Railroad.*

BREHM, ALFRED EDMUND, naturalist, born at Renthendorf, in Thuringia, Feb. 2, 1829; died there, Nov. 11, 1884. He was son of the pastor, CHRISTIAN LUDWIG BREHM (1787–1864), a noted ornithologist. After five years of travel in Africa, Brehm went to Jena and Vienna to study natural science, and subsequently traveled in Spain, Norway, Lapland, Siberia and Turkestan. In 1863 he became keeper of the Hamburg Zoölogical Garden, and in 1867 founded the Berlin Aquarium. His greatest work is the *Illustriertes Thierleben* (2d ed., 10 vols., 1876–79). It has been translated into French and English.

BREISACH, ALT, a town of Baden, situated on an isolated basalt hill (804 feet) on the right side of the Rhine, 14 miles W. of Freiburg. The Mons Brisiacus of Cæsar, it was taken by Ariovistus when he invaded Gaul; being regarded as the key to the west of Germany, it figured prominently in the wars of the seventeenth and eighteenth centuries. The minster is a thirteenth-century structure, with several old monuments. Population, 3,806.

BREISGAU, a German district which in the middle ages extended along the right bank of the Rhine, from the episcopal territory of Strasburg to Basel, embracing Freiburg and the southern Black Forest. Since 1810 it has been part of Baden.

BREITENFELD, a village of Saxony, five miles N. of Leipsic, remarkable for three battles fought in its neighborhood. In the first, fought on the 17th of September (O.S., 7th), 1631, Gustavus Adolphus inflicted a decisive defeat upon the imperialists under Tilly. (See GERMANY, Vol. X, p. 497; GUSTAVUS, Vol. XI, p. 334.) The second battle was also a victory of the Swedes under Torstenson, over the imperial forces under the Archduke Leopold and Piccolomini, Nov. 2 (O.S., Oct. 23d), 1632. The third battle was one act of the great "Battle of the Nations" at Leipsic, Oct. 16, 1813. See LEIPSIC, Vol. XIV, p. 431.

BREITMANN, HANS. See LELAND, CHARLES GODFREY, in these Supplements.

BREMEN, a free city of the German Empire, situated on the river Weser. Its area is 99 square miles; its population in 1891 was 180,443. For its early history, map and constitution, see BREMEN, Vol. IV, pp. 255, 256. Its constitution was proclaimed March 5, 1849.

The port of Bremen is the next largest to Hamburg in its international trade, and is one of the chief outlets of German emigration. In 1890, 140,410 emigrants left that port, being chiefly natives of Austria-Hungary, Russia, Norway, Sweden and Denmark. The number of vessels belonging to the state of Bremen on Jan. 1, 1893, was 405, of 406,172 tons, this number including 180 steamers, of an aggregate burden of 201,124 tons, many of which ply between and maintain an extensive commerce with the principal ports of North and South America, eastern Asia, India and Australia.

BREMEN, a town of Marshall County, northern Indiana, on the Yellow River and the Baltimore and Ohio railroad, 13 miles N.E. of Plymouth, the county seat. It is a manufacturing and lumbering town, and is in the center of an agricultural district. Population 1890, 1,076.

BREMERHAVEN, the port of Bremen, on the east shore of the Weser estuary. It was the scene, in 1875, of a dynamite explosion on board a mail steamship, by which 60 persons were killed. It was built by citizens of Bremen in 1830 to accommodate their shipping interests. It has an outer and inner harbor, wet and dry-docks, and a hospitium for emigrants. The tide rises to a height of 26 feet in the harbor. The population exceeds 16,000. See BREMEN, Vol. IV, p. 255.

BRENDAN OR BRANDAN, SAINT, of Clonfert, an Irish abbot, born at Tralee in 484; died in 577. He studied under St. Jarlath of Tuam, and was ordained by Bishop Erc. His name is memorable chiefly for his voyages in search of "the mysterious land far from human ken." After seven years' fruitless wandering he returned, but once more, in a ship of wood instead of hides, set sail with 60 friends, and at length, after many wanderings, reached "that paradise amid the waves of the sea." Brendan founded a monastery at what is now Clonfert. His festival is on the 16th of May. *The Navigation of St. Brendan* was a very popular book in western Europe as early as the eleventh century; but the two voyages were compressed into one, and many other adventures added. In maps before Columbus's day, "St. Brendan's country" is placed to the south of the Antilles and west of the Cape Verde Islands. See also CELTIC LITERATURE, Vol. V, pp. 325, 326.

BRENHAM, capital of Washington County, south-central Texas, on the Gulf, Colorado and Santa Fé and Houston and Texas Central railroads. It is situated in a fertile cotton and grain region, about 100 miles E. of Austin. It contains manufactories of iron, carriages and lumber, and is an important center for the shipment of cotton. Population 1890, 5,200.

BRENNER PASS, a pass in the central chain of the Alps, between Innspruck on the north and Botzen on the south. A railway was opened through the pass in August, 1867. See ALPS, Vol. II, pp. 621, 619.

BRENTANO, LORENZ, born in Baden, 1813; was member of the Frankfort Parliament in 1848, and became president of the provisional government in Baden in 1849. The grand duke was restored, and Brentano fled to the United States. In 1859 he came to Chicago, became editor of the Illinois *Staats-Zeitung*, and was elected to the legislature. He sat in Congress for two years from 1877. He died in 1891.

BRENTANO, LUDWIG JOSEPH, surnamed LUJO, a German political economist, born at Aschaffenburg, in Bavaria, Dec. 18, 1844. He studied at Dublin and at four German universities, and after attaining a post in the Royal Statistical Seminary in Berlin, went to England to study the condition of the working classes, especially trades associations and unions.

The result of his observation was his work *On the History and Development of English Guilds* (London, 1870); *Die Arbeitergilden der Gegenwart* (2 vols., Leipsic, 1871–72). He became professor of political economy at Breslau, in 1882 at Strasburg, and in 1887 at Vienna. He has written works on wages (1877); labor in relation to land (1877); and compulsory insurance for workmen (1881); on the English chartists; on the Christian socialist movement in England (2d. ed., Leipsic, 1883), and numerous political pamphlets. See also COMPANY, Vol. VI, p. 223.

BRENT-GOOSE OR BRENT BARNACLE (*Bernicla brenta*), a species of wild goose, inhabiting most of the northern hemisphere. The brent-geese live on marine plants and small animals. See GOOSE, Vol. X, p. 778.

BRENTWOOD, a market town in Essex, England, 10 miles S.W. of Chelmsford by rail. It has a richly endowed grammar school, founded by Sir Anthony Brown, chief justice of England, in 1567. There are remains of an old chapel, dedicated in 1221 to St. Thomas à Becket. Population, 4,653.

BRENZ, JOHANN, the reformer of Würtemberg, born at Weil, in Swabia, June 24, 1499; died at Stuttgart, Sept. 11, 1570. He went in his thirteenth year to study at Heidelberg, where, in 1518, he became one of Luther's zealous adherents, and after his appointment as a preacher in the imperial free city of Halle, in Swabia (1522), he openly attached himself to the Reformation. He was at the Marburg Disputation in 1529, and the Diet of Augsburg in 1530, and in 1536 was summoned by Duke Ulrich to Würtemberg to lead the Reformation there. For his opposition to the interim of Charles V he was forced to flee to Stuttgart, where, in 1553, he became "propst" (or superintendent). Brenz was co-author of the Würtemberg Confession of Faith, and his Catechism (1551) has held the next place to that of Luther in Protestant Germany.

BRESSAY, one of the Shetland Isles, separated from Lerwick by Bressay Sound. It is 6 miles long, 1 to 3 miles in breadth, and 10¾ square miles in area. Flag and roofing stones are quarried for exportation. Population 847, chiefly fishermen. Bressay Sound is one of the finest natural harbors in the world, and is a rendezvous for herring-boats, and for whalers and other vessels proceeding north. In it is the harbor of Lerwick, with its lighthouse.

BRETHREN, a sect of Christians. See PLYMOUTH BRETHREN, Vol. XIX, p. 238.

BRETHREN AND SISTERS OF THE FREE SPIRIT, a religious sect. See BEGHARDS, Vol. III, p. 507; and ECKHART, JOHANNES, Vol. VII, p. 642.

BRETHREN OF THE COMMON LIFE, a religious and ethical organization. See EDUCATION, Vol. VII, p. 672.

BRETIGNY, a village in the French department of Eure-et-Loire, 20 miles S. of Paris by rail. Here, in 1360, Edward III concluded a peace with France, by which John II of France was released from his captivity in England on agreeing to pay three million crowns for his ransom, while England renounced her claims to Normandy, Anjou, Maine and Touraine. See FRANCE, Vol. IX, p. 547.

BRÉTON, JULES ADOLPHE, born in 1827, and educated at St. Omer and at Douai. He received his instruction in art under Felix Devigne at Ghent, and in Drölling's atelier at Paris. The subjects of his earlier pictures are taken from the French Revolutionary period, but he soon turned to scenes from peasant life, which he had treated with an admirable union of style with realism. In 1853 he exhibited *The Return of the Harvesters*, and in 1855 his celebrated *Gleaners*. He is represented in the Luxembourg by *Blessing the Harvest* (1857); *The Recall of the Gleaners* (1859); and *Le Soir* (1861). *Evening in a Hamlet of Finisterre* and *The Communicants* are among the most prized of his paintings. Many of his pictures are in private galleries in the United States. Bréton is also known as a poet. His brother, ÉMILE ADÉLARD, is also a noted landscape-painter.

BRETON DE LOS HERREROS, DON MANUEL, Spanish dramatist; born at Quel, in the province of Logroño, in 1796; died at Madrid, Nov. 13, 1873. He served as a volunteer in the army from 1814 to 1822, and subsequently held several government offices for short periods. His poems fill five volumes (Madrid, 1850–52), and he brought out upward of 150 plays, partly original, partly adaptations from the older Spanish classics, and partly translations from the Italian and French, most of which have been highly popular. See SPAIN, Vol. XXII, p. 361.

BRETONIC LANGUAGE. See CELTIC LITERATURE, Vol. V. pp. 298, 324.

BRETSCHNEIDER, HEINRICH GOTTFRIEDSON, VON, a satirist of unsettled life and eccentric habits; born at Gera, Germany, in 1739; died in 1810. From the Moravian Institute at Elbersdorf, Bretschneider passed to the Gymnasium at Gera, and at 17 entered the army. In 1778 he became librarian to the University of Ofen (Buda), and in 1782 Joseph II gave him a government appointment. Of his numerous works, including plays and poems, the chief are his satires, *Almanac der Heiligen für 1788* and *Waller's Leben und Sitten* (1793).

BRETTEN, a town of Baden, the birthplace of Melanchthon, 16 miles N.E. of Karlsruhe by rail. The house in which the reformer was born belongs now to a foundation, bearing his name, for the support of poor students, established in 1861. A monument was erected in 1867. Population, 3,932.

BRETTS AND SCOTS, THE LAWS OF THE, the name given in the thirteenth century to a code of laws in use among the Celtic tribes in Scotland. In the year 1305 an ordinance of Edward I of England, who appeared then to have reduced all Scotland to his subjection, decreed "that the usage of the Scots and the Bretts be abolished, and no more used." It is unknown how far the prohibition took effect. Of the code which it prescribed only a fragment has been preserved. It was printed by Sir John Skene in his

*Regiam Majestatem* (1609), and by Thomas Thomson and Cosmo Innes in the *Acts of the Parliaments of Scotland*, vol. 1 (1844), where the laws are given in three languages—Latin, French and English. The French version, which is the oldest, is printed from a manuscript of about 1270, formerly in the public library at Berne, in Switzerland, now in the Register House at Edinburgh. The fragment of the "laws of the Bretts and Scots" thus published is of much the same nature as the ancient laws of the Anglo-Saxons, the Welsh, the Irish and other nations of western Europe.

BRETWALDA, a title of supremacy among the early Anglo-Saxon kings, the exact signification and history of which are highly uncertain. The *Anglo-Saxon Chronicle* says of Egbert: "And he was the eighth king that was *Bretwalda*"; and the word occurs elsewhere only in an English and Latin charter of Athelstan in 934, in which that king is styled "King of the Anglo-Saxons, and *Brytaenwalda* of all the island." See also ENGLAND, Vol. VIII, p. 271.

BREVARD, capital of Transylvania County, western North Carolina, on the Davidson River, and on the Hudson, Hendersonville and Brevard railroad, about 30 miles S.W. of Asheville. It is in the center of a most picturesque neighborhood, with a population, in 1890, of 327.

BREVARD, EPHRAIM, patriot; born in Mecklenburg County, North Carolina, about 1750; died in Charlotte, North Carolina, about 1783. He was a Princeton graduate, studied medicine and practiced in Charlotte. He was secretary of the noted Mecklenburg convention (May 31, 1775), at which he drew up a "declaration" which preceded the formal Declaration of Independence by a year. With six brothers, Dr. Brevard entered the Continental service, but it was his misfortune to be captured at Charleston, South Carolina, in 1780, and kept in prison till the ills he there suffered caused his death soon after he was liberated. He was a man of many accomplishments, and very influential in promoting the cause of independence.

BREVE, a note in music. The name was originally applied to the shortest of the three notes used in early music, but in modern notation it is appropriated to the longest note used, having double the duration of a semibreve. It occurs but seldom except in church music, modern music being divided into bars, which usually fall short of it in length.

BREVET, in the British and American armies, a commission to an officer which promotes him to a higher rank, irrespective of there being any vacancy in its established number. In the British army this promotion carries with it the higher rate of pay, but is neither purchasable nor salable. (See ARMY, Vol. II, p. 575.) In the United States army, brevet rank extends from first lieutenant to lieutenant-general; does not entitle the holder to the higher rate of pay, and gives no advanced command except by special assignment of the President. Brevets are conferred by and with the consent of the Senate for "gallant actions and meritorious services."

BREVIPENNES, an artificial group of birds, formed by Cuvier for certain short-winged birds which are incapable of flight. The group includes the emu, ostrich, cassowary, apteryx, etc., and is almost equivalent to *Ratitæ*. The group is now obsolete.

BREVOORT, JAMES CARSON, an American scholar and author; born in New York City, July 10, 1818; died in Brooklyn, New York, Dec. 7, 1887. He was educated in Paris, graduating with the degree of civil engineer at the École Central des Artes et Manufactures; returned to the United States, and in 1838 accompanied Washington Irving as secretary when he went as minister to Spain. He traveled much in Europe. He came to reside in Brooklyn, where he held several offices. He was made president of the Long Island Historical Society, regent of the University of New York, superintendent of the Astor library for two years, and member of various historical, scientific, literary and geographical societies. He made valuable collections of books, manuscripts, medals, coins and entomological and ichthyological specimens, which were given to public institutions where they would be preserved for reference. He published, in the *American Journal of Numismatics*, a valuable series of papers on the early Spanish and Portuguese coinage in America; and was the author of *Verrazano the Navigator; or Notes on Giovanno de Verrazano, and on a Planisphere of 1529, Illustrating his American Voyage in 1824* (1874).

BREWER, DAVID JOSIAH, an American jurist; born in Asia Minor, June 20, 1837; son of an American missionary. He was graduated at Yale in 1856, studied law with his uncle, David Dudley Field; was graduated at Albany Law School in 1858, and practiced in Leavenworth, Kansas, where, in 1862, he was elected probate judge, and in 1864 judge of the first judicial district of Kansas. In 1870 he became associate justice of the state supreme court, was re-elected in 1876, again in 1882, and resigned in 1884 to become United States circuit judge for the eighth circuit. On Dec. 4, 1889, President Harrison nominated him associate justice of the United States supreme court, in succession to Stanley Matthews, deceased.



DAVID J. BREWER.

BREWER, EBENEZER COBHAM, an English clergyman and author; born in London, May 2, 1810. He was educated at Trinity Hall, Cambridge, taking a first class in civil law in 1835; and ordained in 1836. He is the author of a number of historical, educational and popular science books, but he is most widely known and appreciated for his many literary, scientific and

other compilations and dictionaries containing a vast amount of information in an easily accessible and handy form, saving literary workers much time in research, as well as putting within their reach much that aids them in illustrating, by quotation and reference, any subject they may have in hand. Of these useful works the following may be mentioned: *Guide to Scientific Knowledge of Things Familiar, with Key* (1850); *A Guide to Every-Day Knowledge* (1864); *Great Central Points of Mediæval and Modern History* (1870); *Dictionary of Phrase and Fable* (1855); *The Reader's Handbook of Allusions, Plots and Stories* (1884); *Authors and their Works, with Dates* (1884); *Dictionary of Miracles* (1884); *Historic Note-Book* (1891). Many of these have gone through several editions, each edition having been carefully revised.

BREWER, JOHN SHERREN, born at Norwich, England, in 1810; graduated with classical honors at Queen's College, Oxford, in 1833, took orders, and was appointed professor of English in King's College, London, in 1841. For several years he edited the London *Standard*, and for nearly twenty years he labored in the Public Record Office, editing the *Monumenta Franciscana* (1858); the *Opus Tertium* and *Opus Minus of Roger Bacon* (1859); volumes 1–3 of *The Works of Giraldus Cambrensis* (1861); the *Calendar of the Carew Papers* (1861), with the aid of Mr. Bullen; and volumes 1–4 of the *Calendar of Letters and Papers, Foreign and Domestic, of the Reign of Henry VIII* (1862–72). As an editor, Mr. Brewer possessed patient industry and a rare sense of order, besides sound judgment and extensive knowledge. He was elected Honorary Fellow of Queen's College in 1870, and in 1877 was presented to the living of Topplefield, in Essex, where he died, Feb. 16, 1879.

BREWER, THOMAS MAYO, an American patron of science, born in Boston, Nov. 21, 1814; graduated at Harvard College in 1835, and at the Massachusetts Medical School in 1838. In 1840 he became editor of the Boston *Atlas*, a Whig organ, and was a member of the publishing firm of Brewer and Tileson. He lived an active professional and business life, and became famous more particularly as an ornithologist. He edited a new edition of *Wilson's Ornithology* (1839); and was joint author, with S. F. Baird (of the Smithsonian Institution) and R. Ridgeway, of *North American Birds* (1874). The only individual work projected by him was the *Oölogy of North America*, one volume of which was published in 1875 by the Smithsonian Institution, but, on account of its expense, was not completed. He died in Boston, Jan. 22, 1880.

*BREWING. For general article on BREWING, see Vol. IV, pp. 264–267. In the United States, before 1795, we do not find that legal enactments were against brewing; still, legislation favorable to the cheaper distribution of distilled liquors made those beverages more prominent, and thus checked the brewing industry In 1789 Madison said that he hoped the industry of brewing would take deep root in every state in the Union, for he foresaw the effect it would have upon the reasonable and moderate potations of the people, without the rigid prohibitions that would almost arouse rebellion; while Thomas Jefferson gave words to his best thought in this wise: "No nation is sober where the dearness of fermented drinks substitutes ardent spirits as a common beverage."

In 1810 there were 129 breweries in this country, most of them engaged in making ale and porter exclusively. The production of malt liquors amounted to 5,754,735 gallons. The year 1847 brought a change for the better, in this way: The German immigration, which had now become of marked ratio to that of other nations, brought with it the importation of their home "lager," a malt beverage of a lighter quality and less alcoholic even than ale or porter. With them they also brought the knowledge of how to brew this liquid, which they had used in the household from infancy to age, and which they considered a necessity, as much as the Yankee considers his morning coffee or his evening tea. With this practical knowledge of the craft brought by skilled workmen, lager-beer breweries began to crop up like early sown wheat, and soon, wherever a sufficient number of Germans made a home in the land of their adoption, the smell of the hop and the smoke of the big chimney testified to the barley-grain again yielding its body, its nutrition and its vitality to the needs of man.

Up to 1862 the story of brewing was one of conflicting elements, the struggle for existence against the advantages of the hard-liquor trade being at times almost annihilating.

But there was coming up in the political history of the country a change that brought the milder beverages prominently to the front. The great Civil War began. Revenue had to be raised. Internal revenue laws came into existence. Ardent spirits were at once heavily taxed. The head of the dragon was badly bruised, and Gambrinus, the beer-brewer, marched by him triumphant. The passage of these laws in 1862 was in reality the beginning of the present immense industry. The extraordinary advancement of brewing from that day to this can only be watched with amazement by the student of its history.

Out of this situation in 1862 the first brewers' association was formed. Patriotic in its first principles, its moving cause was also the idea of self-protection. They came together for the avowed purpose of jointly aiding the government in perfecting the revenue enactments as far as they related to malt liquors, and by their moral influence assuring the right collection of such revenue without fear or favor, while at the same time they proposed to protect themselves from any injustice.

To show what has been the increase in the production of beer since the Civil War, we will give the annual product, beginning at 1863:

| Year. | Barrels. | Year. | Barrels. |
|---|---|---|---|
| 1863 | 2,006,625 | 1865 | 3,657,181 |
| 1864 | 3,141,181 | 1866 | 5,115,140 |

*Copyright, 1896, by The Werner Company.

| Year | Barrels. |
|---|---|
| 1867 | 6,207,402 |
| 1868 | 6,146,663 |
| 1869 | 6,342,055 |
| 1870 | 6,574,617 |
| 1871 | 7,740,260 |
| 1872 | 8,659,427 |
| 1873 | 9,633,323 |
| 1874 | 9,600,897 |
| 1875 | 9,452,697 |
| 1876 | 9,902,352 |
| 1877 | 9,810,060 |
| 1878 | 10,181,158 |
| 1879 | 10,589,937 |
| 1880 | 12,800,900 |
| 1881 | 14,125,466 |
| 1882 | 16,616,364 |
| 1883 | 17,349,424 |
| 1884 | 18,856,826 |
| 1885 | 19,216,630 |
| 1886 | 20,289,029 |
| 1887 | 22,460,345 |
| 1888 | 24,569,682 |
| 1889 | 25,098,765 |
| 1890 | 26,820,953 |
| 1891 | 30,021,079 |
| 1892 | 31,474,519 |
| 1893 | 33,876,466 |
| 1894 | 33,789,984 |
| 1895 | 33,237,648 |

The sale of beer in the principal cities of the United States for the year ending May 1, 1895, was:

| Cities. | Barrels. |
|---|---|
| Albany | 364,694 |
| Baltimore | 591,557 |
| Boston | 1,025,948 |
| Brooklyn | 1,941,395 |
| Buffalo | 618,743 |
| Chicago | 2,687,947 |
| Cincinnati | 1,145,606 |
| Cleveland | 429,665 |
| Detroit | 365,215 |
| Louisville | 212,655 |
| Milwaukee | 2,208,654 |
| Newark | 1,209,058 |
| New York | 4,732,300 |
| Philadelphia | 1,852,106 |
| Pittsburg | 435,880 |
| Rochester | 554,815 |
| San Francisco | 500,183 |
| St. Louis | 1,943,084 |
| Syracuse | 252,202 |
| Toledo | 245,609 |
| Troy | 230,539 |

It does not require eloquence of language to prove the wonderful growth of the brewing industry, from 2,000,000 gallons in 1795 to 1,030,368,088 gallons one century later, when these figures are before us. Out of the present 2,200 brewing plants in this country, by far the greater number are run by Germans. They make "lager" beer. There is every range of size, from the home-brew of a little "garden" to the amazing output of 1,000,000 barrels a year by the greatest firms. Once a man brewed for his neighbors and acquaintances, and his product went no farther than his own familiar village; now hundreds of car-loads of beer leave the shipping centers daily. The capital invested in the brewing industry of the United States is about $400,000,000. The value of the annual output is $200,000,000.

The amount of money yearly paid to the government as internal revenue from the brewing establishments of the country alone is $33,000,000. The local taxes paid amount to about $3,000,000 more.

The advance in the sale of bottled beer from none at all to the number of 42,000,000 bottles annually, mostly in quarts, by one brewery alone, is an astonishing evidence of the amount partaken of by those who use beer at home, upon the family table. It has been ascertained that at the present time 50,000 men owe their living income to the manufacture of beer, since that number is engaged directly in the business.

Many are not aware that there are brewers' schools, where young men are taught the theory and practice of making beer with as much care, and who attain fully as much proficiency in their calling, as do the sons of the professional class in Latin and Greek. Men who have inherited their gifts (one might say their genius) from their fathers are sent to these schools of training, where practice is made perfect by constant experiment, and where higher and better methods are constantly proposed and introduced. This has brought into the field a competition in skill, in intuitive comprehension of the chemical values of things used, and has resulted in a greater advance in the art of brewing since the year 1870 than had occurred during the previous 250 years.

In 1860 the principles which governed the production of beer were, as we have shown, practically the same as in the beginning of the century. Chemistry, physiology and botany had all made their advance, but they had not as yet been practically applied to the brewing of malt and hops, while, although the mechanical arts had progressed in gigantic strides, they were not to any extent used to advance brewing to its present standard, save in the general way of preparation of the various factors which were at length to be picked up and united in one fine and delicate art—an art so exquisite in its manipulations to-day that tens of thousands of dollars may depend upon the slightest miscalculation.

Since 1870 the rapid development of analytical investigation and mechanical progress has given to brewing radical improvements in all directions. To Pasteur, Naegeli, Hansen, Lintner and Dalbrueck the art is particularly indebted, for they have contributed immeasurably to its higher condition.

In 1876 Pasteur published a notable work on the physiology of fermentation, called *Études sur la Bière*, and later Hansen issued at Copenhagen a similar treatise. These volumes were the heralds of dawn in the scientific methods of brewing.

Beer had always been known to be a perishable product, but why it was so, what were the causes that led to its degeneration, was a mystery. Is it not surprising that Pasteur discovered that beer, like the lip that quaffed it, was subject to disease? And besides this, to carry out the strange analogy, the disease might be traced to injurious organisms, bacteria, which by certain means and ways could be killed and destroyed, even as certain treatment in the human body will eliminate the bacteria of one illness or another.

Hansen went a step further, and proved that the brewer's yeast might become, by contact under given circumstances, even more injurious than the bacteria—in two words, the disease "was catching." He triumphed in his experiments by at last cultivating yeast from a single germ, in large quantities, so that it was in absolute purity, and free from any introduction of wild yeast into the beer.

These facts were eagerly adopted and put into practical operation in the larger establishments of this country, and many material changes were brought about. The open cooler was replaced by a closed apparatus. Next came filtered air, germ-free. Next sterilized water, also germ-free, and many other improvements in the cooling, heating and manipulation of the finished product, so that to-day the best beer made, the ideal and

perfect beer, is positively protected from infection. During the last few decades the most complicated processes in the malting of barley, in mashing and in fermentation, have been thoroughly tested and are perfectly understood by the expert. A most important invention should not be missed in this connection—the ice-machine, and the application of artificial refrigeration on a large scale. A quarter of a century ago a Frenchman named Carré invented an imperfect machine, which was idly looked upon as a curiosity, but it was the suggestion for the now perfected machines of Linde and De la Vergne, which are now used by all first-class brewers.

It is to all these improvements combined that America can and does produce not only the best beer in the world, but that which will "keep" the best in all climates. European authorities acknowledge these facts. Professor Dalbrueck of Berlin and Professor Schwackhoefer of Vienna, sent here by their respective governments to investigate the methods and products of American beer-making, agreed that America stands highest, and so reported in their official communications. One point especially should be claimed with pride by us, and that is, the especial process of fermentation which had been in use in this country for years, and which has but recently been proved by Professor Dalbrueck to be the best and most rational process possible. This shows very plainly, that while the theories of European investigators may have been correct, it was not until after we had long had them in practical use that they adopted them abroad.

There is one innovation which deserves attention, since it originated here and is wholly our own. Carbonic-acid gas is collected and utilized in its purity during the process of fermentation. This process does away with the old way of carbonating. The finished beer may now be charged with the finest natural carbonic-acid gas. It is formed in such abundance, still being a sort of by-product of fermentation, that it is destined to crowd out all other gases of the kind. As the solution of this problem was searched for vainly for many years by European experts, Americans may well look upon this achievement with pride.

FRED PABST.

BREWSTER, BENJAMIN HARRIS, an American jurist; born in Salem County, New Jersey, Oct. 13, 1816; died in Philadelphia, Pennsylvania, April 4, 1888. He was graduated at Princeton in 1834, and was admitted to the Philadelphia bar in 1838; was Indian commissioner in 1846, attorney-general of Pennsylvania in 1867–69, and of the United States, under President Arthur, in 1881–85. He prosecuted in the Star Route trials.

BREWSTER, JAMES (1788–1866), an American manufacturer, of New Haven, Connecticut. He was a direct descendant of Elder Brewster of the *Mayflower* colony. In 1810 he first introduced a better grade of vehicles, and the "Brewster wagons" became noted. In 1833–36 he organized the New Haven and Hartford Railroad Company, acting without salary as president, and giving the right of way wherever the road crossed his land. At New Haven he built an almshouse and orphan asylum, donating it to the city.

BREWSTER, WILLIAM, pilgrim of the *Mayflower;* born in Nottingham County, England, about 1560; died in Plymouth, Massachusetts, April 10, 1644. Authorities differ as to the exact dates. He was of good family, and after studying at Cambridge entered the service of William Davison, ambassador, and afterward Secretary of State to Queen Elizabeth, with whom he visited the Netherlands. Subsequently returning to Scrooby, he held the honorable and important office of postmaster. He had become a "Separatist," and as this sect was the object of persecution, he made two attempts to emigrate to Amsterdam. The first effort ended in arrest and imprisonment, as the skipper of the vessel betrayed him and his companions; the second attempt was successful. He was obliged to teach English on arriving at Amsterdam, in order to support himself. Here he set up a printing-press and published religious books which were prohibited in England. Sir Edward Sandys, treasurer of the Virginia Company, secured for him a grant of land in North America; and Elder Brewster, with a company of 100 pilgrims, set sail in the *Mayflower* and landed where Plymouth, Massachusetts, is now located, Dec. 21, 1620. Brewster was made ruling elder of the church and teacher in the colony. All the hardships were patiently borne by him. He left four sons and a daughter, and their descendants are among the esteemed families of New England.

BREWTON, capital of Escambia County, southwestern Alabama, on the Bushey Creek, and on the Louisville and Nashville railroad, about 100 miles S. of Montgomery. It has an academy, lumber-mills, and some manufacturing; in its vicinity fruit is largely raised and shipped North. It is a growing place, its population in 1890 being 1,115.

BRIALMONT, ALEXIS HENRI, a Belgian military engineer, writer and general; born at Venloo, Holland, May 25, 1821. He graduated at the Military College at Brussels, with the rank of sublieutenant, in 1843; and as an engineer officer he was appointed to superintend the works at the fortifications at Diest. He was private secretary to General Chazal from 1847 until 1850, and in 1855 became a member of the staff, attaining the rank of captain in 1857. He then became a major-general, and in 1877 lieutenant-general, and was appointed inspector-general of fortifications and of the sappers and miners of Belgium in 1875. He planned the principal fortifications of Antwerp in 1858, of Bucharest in 1883, and of Liege and Namur in 1887. General Brialmont is the author of a number of works, among them being *Precis d'Art Militaire* (1850); *Histoire du Duc de Wellington* (1856); *Études sur l'Organization des Armées* (1867); *La Fortification Improvisée* (1870); *La Fortification du Champ de Bataille* (1879); *La Fortification du Temps Présent* (1885); etc.

BRIANCHON, CHARLES JULIEN, French mathematician; born at Sèvres in 1785; died in 1865. He contributed some important papers to French mathematical journals, but is best known by a theorem

(see GEOMETRY, Vol. X, p. 397), the correlative of Pascal's, which he published in 1806.

BRIARE, a town in the French department of Loiret, on the Loire, 102 miles S.E. of Paris by rail. The Canal-de-Briare (35 miles long), which unites the Loire and the Seine, was the first constructed in France (1642). Population, 5,034.

BRIAR-ROOT, a fine hardwood obtained from the roots of a species of very large heath (*Erica arborea*) which grows in the Pyrenees, in Corsica and in Algeria. The name is a corruption of the French *bruyère* ("heath"), and has nothing to do with *briar*. See PIPE, Vol. XIX, p. 112.

BRIBERY. Formerly the term *bribery* referred only to the giving or receiving of undue reward to or by an officer whose duty it was to administer justice. The word now has a much more extensive application, and refers to the giving or taking of a bribe by any officer or other person for the purpose of influencing some one in the performance of a duty. The offense applies both to the giver and receiver. The most common occurrence of bribery in this country is that of bribing voters at public elections, and among law-makers, both of the state and city governments. The charge is not infrequently made against members of the Congress of the United States. Bribery is a crime against which state laws generally provide a severe penalty, but frequently, on account of the influence and financial resources of the guilty parties or the shrewd and stealthy methods adopted, the offenders go unpunished. In modern times, probably on account of the vast accumulations of fortunes, which make an incentive for protecting such interests by unlawful means, the crime of bribery has become very prevalent in this as well as other civilized countries. It has been decided in some states that the offense of offering to accept a bribe is a misdemeanor under the common law, even where no bribe has been tendered. This offense, while it is not generally classed as bribery, is now usually included in the statutes against bribery as a punishable offense. To constitute the crime of bribery, it is not necessary that the party accepting the bribe pursue the course as solicited, as the crime is consummated by the giving and accepting the bribe. The constitution mentions bribery as one of the offenses for which the President or other government officers may be impeached. See BRIBERY, Vol. IV, p. 278.

**BRICE, CALVIN STEWART**, an American statesman, born at Denmark, Ohio, Sept. 17, 1845. He entered Miami University, Oxford, Ohio, in 1857, and after serving in the Civil War, graduated in 1863. After this he re-entered the service as captain of an Ohio volunteer corps, being in active service until 1865. He then studied law in the University of Michigan, and was admitted to practice in the United States district and circuit courts at Cincinnati in 1866. He was chairman of the National Democratic Committee in 1889, and in the following year was elected United States Senator, to succeed the Hon. Henry B. Payne, for a six-year term, commencing March 4, 1891.

BRICE, SAINT, bishop of Tours, commemorated as a confessor in the beginning of the fifth century. St. Brice's Day in 1002 (in the reign of Ethelred II) is notorious in old English history for a great massacre of the Danes. It is believed that it was a concerted attempt to exterminate all the Danes in England, but, failing of its bloody purpose, it led to reprisals by the Danish king Sweyn.

BRICKS AND BRICKMAKING. The manufacture of bricks has undergone numerous changes since 1880, owing to the introduction of brick-machines and their continued improvement. First came the soft, wet-clay machines, then the stiff-clay machines, producing an increased quantity of brick of better quality, and lastly came machines making brick on the dry-press system, producing an article as smooth as polished granite. Of the soft-clay machines, those of the auger type have been much used. The clay is first ground and mixed in the pug-mill, which is a large case filled with rotating blades that cut up and thoroughly mix the clay as it passes from the hopper at the top to the delivery at the bottom. This mixed clay passes to the auger-machine, through which it is forced, under a pressure sufficient to compact it, the mass coming out through a rectangular hole two by four inches in size. This stream of molded bar-clay is run out on a traveling belt, and cut into lengths by cross-wires, which descend upon the moving mass with an angular motion that insures a square cut. The bricks thus completed are separated by a peculiar motion of the belt, and sent to the kiln. This machine was considered among the best until about 1893, since which time the dry-press system has been coming into use. The Johnson dry-press machine produces four bricks at a time, molded under a total pressure of 600 tons. The clay is introduced in the form of dust from a grinding-mill, and fed in through a bottomless box, which transfers the clay to the molds. A long-stroke toggle device delivers the pressure, which is given with a dwell, and as the pressure is removed, springs in the bottom of the mold act to throw out the contents.

The Fawcett brick-press, which is of English manufacture, is similar to the Johnson in its method of pressing the bricks, but has molds so constructed that as soon as the brick is formed the sides and ends fall away, and the finished brick is pushed out. The molds are eight in number, and they are mounted on a circular table in such manner that they are brought successively into the machine by rotation of the table. At two points in the circuit are sanding-riddles. The product is 7,000 bricks a day. The Boyd brick-press, which was exhibited at the Columbian celebration in Chicago, has an output of 20,000 bricks a day, and receives the clay nearly dry in canvas chutes. It will make a great variety of ornamental shapes.

The manufacture of brick in odd and ornamental shapes and colors has developed very fast within a decade. They are used for corners,

trimmings, closers, arches, etc. One of the latest novelties comes from Silesia, and is a hollow glass brick, the interior space being about one third the area of the whole brick. It is blown like a bottle, and closed at a temperature of about 500° F., which results in leaving rarefied air in the interior, to serve as a non-conductor. Used in walls, it admits light, but cannot be seen through. The makers are endeavoring to introduce them for use in roofing. For this purpose they are set in a metal framework, and are said to be as durable as wire-glass.

C. H. COCHRANE.

BRIDEWELL, a well between Fleet Street and the Thames, London, dedicated to St. Bride, which has given its name to a palace, parish, house of correction, hospital and an industrial school. At Bridewell, in the time of William the Conqueror, there was a well-fortified castle; and here a palace was rebuilt by Henry VIII in 1552, and was used as a royal residence. Edward VI gave it over to the city of London to be used as a workhouse for the poor and as a house of correction for incorrigibles. The Bridewell, as the place had hence become known, at last became a place of punishment for general criminals, remaining so until its removal in 1864. (See LONDON, Vol. XIV, pp. 834, 839.) The name *Bridewell* is applied universally to a house of correction for disorderly persons or criminals, particularly to a municipal or police "lock-up."

BRIDGE, JOHN FREDERICK, an English composer; born at Oldbury, in Worcestershire, Dec. 6, 1844. He was a chorister at Rochester from 1850 until 1859, and was subsequently a pupil of Sir John Goss. In 1872 he was appointed professor of harmony at Owens College, Manchester, and in 1874 took his degree of doctor of music at Oxford, for which he composed his oratorio, *Mount Moriah*. In 1875 he was appointed deputy organist at Westminster Abbey, succeeding to the chief office in 1882, upon the death of Mr. James Turle. In this position he arranged all the music and composed a special anthem for the celebration of the Queen's jubilee in the Abbey, June 21, 1887, for which he received the thanks of her Majesty, and the silver jubilee medal. He also set the music to Tennyson's *Crossing the Bar* for the obituary service of the poet laureate at Westminster, Oct. 12, 1892. Besides the above, his *Hymn to the Creator* was produced at Worcester in 1884; his setting of Mr. Gladstone's Latin translation of Toplady's *Rock of Ages*, at Birmingham in 1885; *Callirhoë*, at Birmingham in 1888; *The Repentance of Nineveh*, at Worcester in 1890; *Rudel*, at Chester in 1891. In 1895 Dr. Bridge was professor of harmony at the Royal College of Music and examiner in music for the University of Oxford.

BRIDGE-IRON TESTS. See STRENGTH OF MATERIALS, in these Supplements.

BRIDGE, WHEATSTONE'S. See ELECTRICITY, Vol. VIII, p. 44.

BRIDGE OF ALLAN, a town on Allan Water, Stirlingshire, Scotland, three miles N. of Stirling. It is situated at the southern base of the range of hills called the Ochils, towards the west, and is well sheltered from the east, thus making it, with its naturally salubrious climate and its saline mineral springs at Airthrey, a favorite resort for invalids in the spring and autumn. It is located near many historical and other objects of interest, and had a population of 3,207 in 1891, besides which about 50,000 visit it annually.

BRIDGEPORT, a city and seaport, one of the capitals of Fairfield County, Connecticut, situated on Long Island Sound, 58 miles N.E. of New York, on the New York, New Haven and Hartford railroad, at the southern terminus of the Housatonic and Naugatuck railroads. The streets are well paved, handsomely shaded and lighted with gas and electricity. Horse-cars traverse all parts of the city. It has an efficient police force and fire department, and an abundant water-supply. A new court-house and a United States building for post-office and custom-house have recently been completed. It has a city high school, systems of public schools, several private schools, a public library of 18,000 volumes, and a number of charitable institutions. The city has four handsome parks. Population 1870, 18,969; 1880, 27,643; 1890, 48,866. See BRIDGEPORT, Vol. IV, p. 284.

BRIDGEPORT, a village of Belmont County, eastern Ohio, is situated on the Ohio River, opposite Wheeling, on the Cleveland, Lorain and Wheeling railroad. It contains important manufactories of iron, glass, stoves, machinery, barrels and lumber. In the vicinity are extensive coal-mines. Population 1890, 3,369.

BRIDGEPORT, a beautiful town of Montgomery County, southeastern Pennsylvania, situated on the Schuylkill River, opposite Norristown. It contains manufactories of paper, woolens, earthenware, railroad cars and iron, and in the neighborhood are numerous lime-kilns. Population 1890, 2,651.

BRIDGER'S PASS, a defile in the Rocky Mountains, in the southwest corner of Wyoming. Previous to the opening of the Pacific railroad the overland and emigrant mail route went through this pass in crossing the mountains. It is several miles in length, and its walls are narrow and precipitous, consisting of rocks of granite and metamorphic sandstone rising to a sheer height of about 2,000 feet.

BRIDGES. For an elaborate illustrated article on bridges, with an extended discussion of the tensile strength of materials, architectural finish, and practical construction of various kinds of bridges, see BRIDGES, Vol. IV, pp. 284, 341. The following is an alphabetical list of the principal bridges throughout the world, with descriptive notes of those which are most recent:

Albany (over the Hudson)—Stone; length, 1,740 feet.
Alcantara—Stone; length, 612 feet; semicircular arch.
Alma—Stone; length, 452 feet; elliptical arch.
Almaraz—Stone; length, 530 feet; semicircular arch.
Amu-Daria (Russian Turkestan)—6,804 feet in length.
Arcueil Aqueduct—Stone; length, 1,279 feet; semicircular arch.
Aricia Viaduct—Stone; length, 885 feet; semicircular arch.

Arthur Kill—Staten Island, New York. See descriptive notes below.
Athlone—Wrought-iron; length, 564 feet; truss.
Avignon—Length, 1,710 feet.
Avon Viaduct—Stone; length, 725 feet; elliptical arch.
Badajoz—Length, 1,874 feet.
Ballochmyle Viaduct—Stone; length, 645 feet; semicircular arch.
Barentin Viaduct—Stone; length, 1,545 feet; semicircular arch.
Barnes—Cast-iron; length, 380 feet; arch, segment.
Beaugency Viaduct—Stone; length, 911 feet; semicircular arch.
Belfast—Length, 2,500 feet.
Bellocour—Stone; length, 417 feet; elliptical arch.
Berne—Stone; length, 405 feet; arch, segment.
Bideford—Stone; length, 720 feet; ogival.
Bietigheim Viaduct—Stone; length, 936 feet; semicircular arch.
Bilbao (Spain)—Iron girder bridge; 500 feet span; from a basket-like platform swings a car which runs across, carrying passengers.
Biscari Aqueduct—Stone; length, 1,222 feet; ogival.
Bismarck (over Missouri River). See notes below.
Blackfriars—Stone; length, 995 feet; elliptical arch.
Bombay (Madras)—Length, 3,730 feet.
Boston—Length, 3,483 feet.
Boyne—Wrought-iron; length, 1,760 feet; lattice; cost $700,000.
Brighton Viaduct—Brick; length, 960 feet; semicircular arch.
Britannia (Menai Straits, Wales, 1846–50)—Wrought-iron; length, 1,488 feet; tubular; cost, $3,009,325.
Brooklyn (East River). See notes below.
Cairo (Illinois; over Ohio River)—Has 7 chief spans and 43 minor; 10,560 feet in length.
Calcutta (over Hooghly)—Iron girders, resting on 28 pontoons; 63 feet wide; 1,530 feet in length.
Carpentras Aqueduct—Stone; length, 2,558 feet; semicircular arch.
Caserta Aqueduct—Stone; length, 1,687 feet; semicircular arch.
Chalons—Stone; length, 328 feet; semicircular arch.
Chaumont Viaduct—Length, 1,968 feet; semicicular arch.
Chavanes—Stone; length, 420 feet; elliptical arch.
Chelsea—Length, 700 feet; suspension.
Chepstow—Cast and wrought iron; length, 628 feet; tubular.
Chirk Aqueduct—Stone; length, 710 feet; semicircular arch.
Cincinnati and Covington (over the Ohio)—Built 1867; length, 1,067 feet; suspension. See notes below.
Civitâ Castellani Aqueduct—Stone; length, 820 feet.
Clifton (over Niagara River)—Length, 1,268 feet; suspension. See notes below.
Coldstream—Stone; length, 355 feet; arch, segment.
Cologne (over the Rhine)—Iron; length, 1,532 feet; arch.
Colorado River (United States)—Cantilever; 990 feet span.
Congleton Viaduct—Stone; length, 2,870 feet; arch, segment.
Crumlin Viaduct—Iron; length, 1,050 feet; truss-gird; cost, $195,000.
Danube (near Stadlan, Austria)—Iron; length, 2,520 feet.
Danube (Vienna; 1828)—Second suspension bridge; 334 feet; linked steel bars.
De la Ture Viaduct—Stone; length, 888 feet; semicircular arch.
Dean—Stone; length, 450 feet; arch, segment.
Dee Viaduct (Delaware River, Pennsylvania)—Stone; length, 1,388 feet; semicircular arch.
Dinan Viaduct—Stone; length, 635 feet; semicircular arch.
Dinting Vale Viaduct—Timber; length, 1,452 feet; arch, segment.
Dolhain Viaduct—Stone; length, 786 feet; semicircular arch.
Dubuque (over the Mississippi)—Iron; length, 1,758 feet.
Dunkeld—Stone; length, 470 feet; arch, segment.
Eauplet—Timber; length, 1,148 feet; segment ribs.
Elsterthal Viaduct—Stone; length, 892 feet; elliptical arch.
Emilius—Stone; length, 550 feet; semicircular arch.
Florence (over the Arno)—Built 1569; marble; length, 322 feet; elliptical arch.
Forth (Scotland). See notes below.
Franzdorf Viaduct—Stone; length, 1,916 feet; semicircular arch.
Fribourg (built 1832)—Wire rope; length, 870 feet; suspension; cost $125,000.
Garabit (Truyere Valley, France)—Of latticed girders; center rests on a metallic arch of 541 feet span; 1,500 feet long; 400 feet high.
Gignac—Stone; length, 412 feet; elliptical arch.
Glasgow—Stone; length, 406 feet; arch, segment.
Godavery Irrigation Aqueduct—Stone; length, 2,356 feet; arch, segment.
Goeltzschthal Viaduct—Stone; length, 1,900 feet; elliptical arch.
Guetia—Stone; length, 1,476 feet; semicircular arch.
Harlem River Aqueduct—Stone; length, 1,450 feet; semicircular arch.
Havre de Grace (Maryland; new Susquehanna)—6,315 feet in length.
Hawksbury (New South Wales)—Iron and steel; length, 2,900 feet; cost, £350,000; opened May 1, 1889.
Hexham—Stone; length, 524 feet; arch, segment.
Hungerford—Length, 1,350 feet; suspension.
Indre Viaduct—Stone; length, 2, 463 feet; semicircular arch.
Invalides (1)—Length, 480 feet; suspension.
Invalides (2)—Length, 412 feet; suspension.
Invalides (3)—Stone; length, 468 feet; arch, segment.
Jena—Stone; length, 546 feet; arch, segment.
Kansas City (over Missouri)—7,633 feet in length.
Kelso—Stone; length, 410 feet; elliptical arch.
Kentucky River—Iron; length, 1,138 feet; cantilever; opened April 20, 1877. See notes below.
Kieff—Length, 2,562 feet; suspension.
Lake Zurich (Rapperschwyl Bridge)—5,333 feet in length.
Landore Viaduct—Timber; length, 1,760 feet; truss; cost $143,600.
Langon—Wrought-iron; length, 678 feet; girder.
Larbert—Stone; length, 432 feet; arch, segment.
Libourne—Stone; length, 690 feet; elliptical arch.
Limerick—Stone; length, 412 feet; elliptical arch.
Lisbon Aqueduct—Stone; length, 3,805 feet; ogival.
Lockwood Viaduct—Stone; length, 1,428 feet; semicircular arch.
Loeban Viaduct—Stone; length, 624 feet; semicircular arch.
London (Thames)—Stone; length, 1,005 feet; elliptical arch; cost, £1,458,311; opened 1831.
Louisville (Kentucky; over the Ohio)—Length, 5,310 feet. See notes below.
Lune Aqueduct—Stone; length, 420 feet; semicircular arch.
Maintenon Aqueduct—Stone; length, 16,367 feet; semicircular arch.
Malaunay Viaduct—Stone; length, 500 feet; semicircular arch.
Maule River (Chile)—335 feet high; 1,419 feet in length; five spans.
Mayence (over the Rhine)—Length, 3,380 feet; arch, segment.
Memphis (Tennessee; over Mississippi), rests on four piers; longest span, 720 feet.
Menai (built 1819–25)—Length, 1,050 feet; rst suspension.
Mersey—Stone; length, 447 feet; semi .rcular arch.
Mont Louis—Stone; length, 1,257 fee elliptical arch.
Montpellier Aqueduct—Stone; leng a, 3,214 feet; semicircular arch.
Nabresina—Stone; length, 2,115 feet; semicircular arch.
Neuilly (built 1774)—Stone; length, 865 feet; elliptical arch.
Nevers—Cast-iron; length, 1,066 feet; arch, segment.
New Westminster—Cast and wrought iron; length, 900 feet; elliptical arch.
Newcastle High Level—Cast-iron; length, 820 feet.
Niagara (built 1855)—Length, 2,220 feet; suspension; cost $400,000.
Niagara (1883)—Iron and steel; length between anchorage and piers, 910 feet; cantilever. See notes below.
Nogent-sur-Marne Viaduct—Stone; length, 2,722 feet; semicircular arch.
Old London—Stone; length, 926 feet; arch, segment.

Omaha (over the Missouri)—Length, 2,800 feet. See notes below.
Orb Canal Aqueduct—Stone; length 648 feet; elliptical arch.
Orense—Stone; length, 1,209 feet; ogival.
Orleans—Stone; length, 1,110 feet; elliptical arch.
Ouse Valley Viaduct—Brick; length, 1,290 feet; semicircular arch.
Paris (Seine; 1803)—First iron bridge in France; nine arches; 516 feet in length.
Parkersburg Bridge (West Virginia)—Iron; length, 7,045 feet.
Pavia—Stone; length, 620 feet; ogival.
Perth—Stone; length, 606 feet; arch, segment.
Pesth (built 1840–49)—Length, 1,262 feet; suspension.
Po (near Mezzano-Cortz, Italy)—Length, 2,485 feet.
Potomac—Length, 5,300 feet.
Pont de la Concorde—Stone; length, 490 feet; arch, segment.
Pont du Gard Aqueduct—Stone; length, 879 feet; semicircular arch.
Pont Neuf—Stone; length, 996 feet.
Pont y Cys Sylte Aqueduct—Cast-iron; length, 1,007 feet; arch, segment.
Ponte dell' Arcate Aqueduct—Stone; length, 600 feet; semicircular arch.
Ponte Curvo—Stone; length, 640 feet; semicircular arch.
Portage Viaduct—Timber; length, 876 feet.
Poughkeepsie—Iron and steel; length, 6,767 feet: cantilever; opened Feb. 1, 1889. See notes below.
Prague—Stone; length, 820 feet.
Prairie du Chien (over Mississippi)—Length, 7,000 feet; drawbridge. See notes below.
Pyrgos Aqueduct—Stone; length, 723 feet; semicircular arch.
Quincy (over Mississippi)—Iron; length, 3,200 feet. See notes below.
Ratisbon—Stone; length, 994 feet; semicircular arch.
Ribble—Stone; length, 675 feet; elliptical arch.
Riga—Stone; length, 2,600 feet; semicircular arch.
Roanne—Stone; length, 622 feet; elliptical arch.
Rochester (new)—Cast-iron; length, 498 feet; arch, segment.
Rochester (old)—Stone; length, 560 feet; arch, segment.
Royal Border Bridge (Berwick)—Stone; length, 2,160 feet; semicircular arch.
Roman Aqueduct (near Lyons)—Stone; length, 765 feet; semicircular arch.
Saltash—Wrought-iron; length, 2,195 feet; girder.
Saumur—Stone; length, 920 feet; elliptical arch.
Schildesche Viaduct—Stone; length, 1,230 feet; semicircular arch.
Schuylkill—Timber; total length, 1,000 feet; frame truss. See notes below.
Schuylkill—Cast-iron; length, 1,000 feet; arch. See notes below.
Severn (1777–79)—First iron bridge in England; still standing.
Solani Aqueduct—Stone; length, 1,050 feet; arch, segment.
Southwark—Cast iron; length, 710 feet; arch, segment.
Spoleto—Stone; length, 876 feet; ogival.
St. Angelo—Stone; length, 520 feet; semicircular arch.
St. Anne's—Wrought-iron; length, 1,350 feet; tubular.
St. Charles (Missouri)—Iron; length, 6,536 feet.
St. Esprit—Stone; length, 2,690 feet; arch, segment.
St. Germain Viaduct—Stone; length, 820 feet; semicircular arch.
St. Louis (over the Mississippi)—Iron; length, 1,509 feet; arch. See Vol. IV, p. 339.
St. Petersburg—Cast-iron; length, 1,090 feet; arch, segment.
Staines—Stone; length, 410 feet; arch, segment.
Stockport—Stone; length, 1,792 feet; semicircular arch.
Strasburg—Stone; length, 3,390 feet; semicircular arch.
Stratford-on-Lea (Essex, England)—First large stone arched bridge; 1818; three-arched, bow-shaped; removed 1839.
Sukkur (over Indus)—Iron; length of main span, 820 feet; cantilever.
Susquehanna—Stone; length, 3,500 feet; semicircular arch. See notes below.
Tarascon—Cast-iron; length, 1,575 feet; arch, segment.
Tarragona (Roman aqueduct)—Stone; length, 895 feet; semicircular arch.
Tay (at Dundee)—Iron; length, 10,612 feet; viaduct; cost, £350,000; opened May 22, 1887.
Toulouse—Stone; length, 1,422 feet; elliptical arch.
Tower (over Thames)—Iron; length, 2,640 feet; suspension. See notes below.
Tyne Viaduct—Stone; length, 902 feet; semicircular arch.
Val Fleury Viaduct—Stone; length, 468 feet; semicircular arch.
Vauxhall—Cast iron; length, 798 feet; arch, segment.
Verona (Caccaglio)—Stone; length, 1,328 feet; ogival.
Victoria (St. Lawrence)—Wrought-iron; length, 9,437 feet; tubular.
Vistula River (near Dirschau, Germany)—Iron; length, 2,750 feet.
Washington (over Harlem River, New York City)—Iron and steel; length, 2,380 feet; arch; opened May 1, 1889. See notes below.
Waterloo (London; built 1811–17)—Stone; length, 1,380 feet; elliptical arch.
Wearmouth (Devonshire, England)—Iron; 235 feet span; arch, segment.
Westminster (London, built 1750)—Stone; length, 1,220 feet; semicircular arch.

NOTES ON THE FOREGOING LIST. With the exception of the Tower Bridge and Forth Bridge, those described in the following notes are all American, a number of them having been constructed during the past decade. They are placed in alphabetical order for the purpose of convenient reference.

*The Albany Bridge*, 1,740 feet in length, was built over the Hudson River at Albany to connect the New York Central railroad with the Harlem, Boston and Albany roads. It has, altogether, 15 spans, and a swing bridge 274 feet long.

*The Arthur Kill*, a drawbridge, was authorized by act of Congress of June 16, 1886, and on June 13, 1888, was pronounced in working order. The Kill is a tidal river separating Staten Island, New York, from New Jersey. The length of the bridge, not including approaches, is 800 feet. The two shore-spans are each 150 feet in length, and are covered by fixed trusses and two draw-spans, each 206 and 204 feet in the clear. The total length of the drawbridge is 500 feet, and it can be opened or closed in about two minutes. The total cost of the bridge was $450,000.

*The Bismarck Bridge*, over the Missouri River, between Bismarck and Mandan, North Dakota, forms an integral part of the Northern Pacific railroad. The construction of the bridge, which was begun in April, 1881, involved the control and rectification of the river. This consisted in confining the river to the limit of 1,000 feet between the east shore and the end of the dike, and the protection of the east shore with riprap, so as to render it doubly secure from the eroding action of the water. There were used in the construction of the dike 30,000 tons of granite boulders for riprap, besides a large quantity of brush and crib-logs, and upwards of 28,000 cubic yards of clay. The bridge proper consists of three through spans, each measuring 400 feet between centers of end piers, and two approach-spans, each 113 feet. The east end of the east approach-span is supported by a small abutment of granite masonry founded on the natural ground of the bluff. The west end of the west approach-span is supported by an iron bent resting on two cushion cylinders, which are supported by piles driven into the sand-bar. The three long spans are supported by four granite piers, containing each 600,950 pounds of wrought-iron, 348,797 pounds of steel, and 25,779 pounds of cast-iron. The bridge was completed Oct. 7, 1882. George S. Morrison was the engineer during construction.

*The Brooklyn Bridge*, or East River Suspension Bridge, which connects the city of Brooklyn with New York City, was formally opened on May 24, 1883. The designs were completed by the late John A. Roebling at least ten years

before the work of construction was begun, which occurred Jan. 2, 1870. The caisson for the Brooklyn tower was sunk in 1871, and the caisson for the New York tower was laid the year following. These caissons were sunk by the pneumatic process, and the compressed air caused many cases of caisson disease. The Brooklyn tower, which contains 38,214 cubic yards of masonry, was completed in May, 1875, and the New York tower, containing 46,945 cubic yards of masonry, was finished in July, 1876. The first wire was run out May 29, 1870. The cable-making commenced June 11, 1877. Each cable contains 5,296 parallel galvanized-steel oil-coated wires, closely wrapped in a solid cylinder 15¾ inches in diameter. The total height of towers above the high-water line is 278 feet. The clear height of bridge in center of river-span above high water is 135 feet. The depth of foundation below high-water mark is 45 feet for Brooklyn tower, and 78 feet for New York tower. The length of each land-span is 930 feet and 1,860 feet, respectively; length of Brooklyn approach, 971 feet; length of New York approach, 1,562; making the total length of the bridge 5,989 feet. The length of the suspended structure from anchorage to anchorage is 3,454 feet; and its total weight is 6,470 tons. The termini of the bridge are respectively opposite the City Hall, New York, and at the junction of Sands and Fulton streets, Brooklyn. The bridge has a width of 85 feet. The roadway is divided into a central promenade, with a single track on either side for rapid transit, and a platform for passengers, which is in turn flanked by a tramway for wheeled vehicles. The actual cost of the bridge was nearly $15,000,000. Engineer Roebling died June 22, 1869, when his son, Washington A. Roebling, was placed in charge of the work. The latter was prostrated early in 1872 by a peculiar form of caisson disease, which compelled him for a while to give up active work, but his intellectual faculties remained unimpaired. C. C. Martin was principal assistant engineer, and has held the position of superintendent and principal engineer since the completion of the bridge.

*The Clifton Bridge*, though of less importance than the Niagara bridge proper, is quite remarkable, from its peculiar construction. The end resting on the left bank is three quarters of a mile below the great Horseshoe Fall on the Canada side of the Niagara River. The end of the bridge resting on the right bank is 300 yards below the American Fall. The span between the centers of towers is 1,268 feet 4 inches. The elevation is 183 feet above the water on the Canada side, and 188 feet on the American side, and the elevation of the center is from 190 to 193 feet, according to the season. The total length of each cable is 1,888 feet. The length of the bridge from rock to rock is 1,190 feet.

*The Cincinnati and Covington Bridge*, erected over the Ohio River by the noted engineer John A. Roebling, was completed in 1867. The main span, from center to center of towers, is 1,067 feet, and the total length between abutments is 1,619 feet. The elevation of floor above low water at center is 103 feet. The length of the Cincinnati approach from Front Street to the abutment is 341 feet. The total length of the bridge, including approaches, is 2,252 feet. There are two cables, each 12⅓ inches in diameter.

*Firth of Forth Bridge.* In 1882 an act of Parliament was obtained for the construction of a cantilever bridge over the river Forth at Queensferry, Scotland, which was begun in 1883, and formally opened on March 4, 1890. The bridge consists of two approach-viaducts and of the cantilever bridge proper. The length of the cantilever bridge is 5,330 feet, consisting of the central tower on Inchgarire, 260 feet; the Fife and Queensferry central towers, 145 feet each; the two central connecting girders, 350 feet each; and six cantilevers of 680 feet each. The cantilever end-piers are apart 5,349 feet 6 inches from center to center. The south approach-viaduct is 1,978 feet long from center of cantilever end-pier to end of arches, consisting of ten spans of 168 feet each, four arches of 66 feet each, center to center, and 34 feet made up by abutments. The north approach-viaduct is 968 feet 3½ inches long to end of arches, consisting of five spans of 168 feet each in length, three arches of 37 feet, 31 feet and 46 feet, center to center, respectively, and 14 feet 3½ inches made up by abutments. The total length of the structure is therefore 8,295 feet 9 inches. The two main strands are 1,710 feet from center to center of vertical columns, made up of two cantilevers of 680 feet each, and one central girder 350 feet. The cost of the bridge was £1,600,000, and over 50,000 tons of steel were used in the construction.

*The Kentucky River Bridge*, erected on the line of the Cincinnati Southern railway, has a length, between abutments, of 1,138 feet. The erection was commenced Oct. 16, 1876. The bridge was completed Feb. 20, 1877, and the official test was made April 20th of the same year. The engineer who designed the bridge and carried out the work of construction is C. Shaler Smith. The iron-work is of superior quality.

*The Louisville Bridge*, which crosses the Ohio River at Louisville, is one of the largest iron bridges in America. It has 27 spans, and a total length of 5,310 feet.

*The Niagara Cantilever Bridge*, over the Niagara River, about two miles below the falls, and 300 feet above the railroad suspension bridge, spans a chasm of 850 feet in width, and 210 feet in depth to the surface of the water. The river is 425 feet wide at the bridge site. The banks slope at about 45 degrees from the water's edge to about 50 feet below the top of the cliff, above which they are perpendicular. The structure carries a double track. It consists of two cantilevers resting on the towers, the shore end being anchored to the anchorage piers, and the river ends connected by an intermediate span. The distance between centers of anchorage piers is 910 feet 2½ inches; length of each cantilever, 395 feet; length of intermediate span, 120 feet. Each cantilever consists of a shore-arm 195 feet long, one panel 25 feet over the tower, and a river-arm of 175 feet in length. C. C. Schneider was appointed chief engineer April 26, 1883. The work was vigorously pushed, and the bridge was completed and opened for traffic Dec. 20, 1883.

*The Omaha Bridge*, which crosses the Missouri River at Omaha, has 11 spans of 250 feet each. The total length is 2,800 feet.

*The Poughkeepsie Bridge*, across the Hudson River at Poughkeepsie, was originally promoted by the Pennsylvania Railroad Company in 1873, but after the foundation-stone of the eastern shore-pier had been laid the project was abandoned. In 1876 the scheme was revived, and the actual work of building began, but was suspended in 1878, and not resumed until 1886. By this time a cantilever design had been decided on, and the 530 feet, center to center of end piers, necessary to reach these bluffs was made common for all three cantilever spans. The clear span, with the half-width of the towers added, made the spans next the shores 548 feet, and the center span 546 feet, which, with the connecting ones of 525 feet, center to center of piers, located pier 6 in the face of the rock on the east shore. The total length between anchorages was thus established at 3,093 feet 9 inches, the total length, including viaducts, 6,767 feet 3 inches. The general design of the river piers is a crib and grillage, extending from the gravel to 10 feet below high water. On this is the masonry to 30 feet above high water, upon which is a steel tower 100 feet high to pedestals of trusses. The towers at the end of the spans were first erected; next, commencing at the fixed end, the bottom chord was laid along in place on camber blocks; then, commencing from the middle, the traveler erected the span. From the shore-arms and connecting spans, cantilevers of 160 feet were erected by means of projecting travelers, composed of two trusses 118 feet long, with chords and vertical posts of wood and iron ties and splice-plates. The bridge was opened for traffic on Feb. 1, 1889; it reduces the distance between the anthracite fields of Pensylvania and points east of the Hudson from 116 to 35 miles.

*The Prairie du Chien Pontoon Railroad Bridge* was built in 1874 across the Mississippi River, between Prairie du Chien, in Wisconsin, and North McGregor, in Iowa, for the purpose of connecting the divisions of the Chicago, Milwaukee and St. Paul Railway Company, terminating, respectively, at the points named. The river here is divided by an interjacent island into two channels, both

of which are navigated. The McGregor channel is 1,500 feet wide, while the width of the Prairie du Chien channel is 2,000 feet. The distance between the Wisconsin and Iowa shores, embracing the island, is 7,000 feet, which corresponds to the length of the bridge. Each of the draws is a single float 30 feet wide at the bottom, 6 feet deep, 41 feet on deck, and 408 feet in length. Each draw contains about 600,000 feet of plank and timber.

*The Quincy Iron Bridge*, which crosses the Mississippi at a point where the width of the river is 3,200 feet, has 17 spans, and was designed and constructed under Thomas C. Clarke, at a cost of over $1,000,000.

*The Schuylkill Arch-Truss Bridge*, constructed by Lewis Wernwag in 1812, at Philadelphia, was familiarly known as the "Colossus of Fairmount," having a single span of 340 feet 3¾ inches. In consideration of its length of span (longer than any one which had yet been erected), its solidity and its strength, it was regarded by visitors as a veritable "wonder of the world." This was Wernwag's third bridge. From that date until 1834 he built 29 additional bridges, one of them being the famous "Economy" bridge erected over Neshaminy Creek, Pennsylvania, and specially noted for its simplicity and inexpensiveness of construction. Its type was much like that of the cantilever bridges prevalent at later dates.

The "Colossus" bridge was destroyed by fire in 1839, and was succeeded by the first wire suspension bridge in this country. It was planned and erected by Charles Ellet, (q.v., in these Supplements) who, later, designed and built (in 1847) the railway bridge across the Niagara River below the falls, and who, still later, built a suspension bridge at Wheeling, West Virginia.

*The Schuylkill Cast-Iron Arched Bridge*, erected at Chestnut Street, Philadelphia, Pennsylvania, over the Schuylkill River, was finished in 1866. It has two main spans of 185 feet. The total length is 1,000 feet. The cost of construction was $500,000.

*The Susquehanna Bridge*, which crosses the Susquehanna River, is located on the Pennsylvania railroad, 5½ miles north of Harrisburg, Pennsylvania. It is supported on 22 piers and two abutments. The total length of the bridge is 3,500 feet.

*The Tower Bridge*, across the Thames River, London, has a total length of 2,640 feet, including the necessary approaches on both sides. The distance between the abutments on the two sides of the river is 880 feet. The two massive piers of masonry, each 10 feet wide, have been built in the bed of the river, leaving a central opening 200 feet wide above high water, and two side openings, each 270 feet wide, the area of waterway being 20,040 square feet. Along the approaches and across the side-spans the roadway is 60 feet wide, but across the central span the width is reduced to 50 feet. The headroom under the bridge is 29½ feet, and this is sufficient for most of the river traffic. To allow the passage of vessels of greater height, the central span is made in the form of two leaves nicely balanced, so that they may be easily raised to bring the roadway into a vertical position, hydraulic machinery being used for that purpose. The raising of these leaves, of course, interrupts the traffic of vehicles, but foot-passengers are able to cross at all times, by two permanent high-level gangways. The quantities of materials in building this bridge are estimated at 250,000 cubic feet of stone and 70,500 cubic feet of concrete for the piers and approaches, while 15,000 tons of iron and steel were used in the bridge proper. The end of 1892 was the date given to the contractors to complete all the work, but the period had to be extended two years longer, and in 1894 the bridge was opened by the Prince of Wales.

*The Washington Bridge*, built over the Harlem River at One Hundred and Eighty-first Street, New York City, derives its name partly from its contiguity to Washington Heights and Fort Washington, and partly from having been opened at the Washington Centennial, May 1, 1889. The total length of the bridge and approaches is 2,380 feet. Each approach is 660 feet long, leaving 1,060 feet for the main bridge. The masonry superstructure is of granite, and includes an east and west approach, terminating in abutments from which the two great arches spring. The western approach is level; the first portion, 260 feet in length, is in earthwork supported by masonry side-walls. The west is in masonry, including three semicircular arches, each of 60 feet span. The eastern approach starts on a lower grade, and for part of its length rises toward the bridge. There are 300 feet in earthworks, and the remaining 360 feet include three semicircular arches of 60 feet span, and one seven-centered of 56 feet span. A clear width of 80 feet is afforded over this portion, as well as over the remainder of the structure, 50 feet of which are roadway, while 30 feet are devoted to the sidewalks. The roadway is paved with asphalt. The supporting members of the bridge proper consist of two steel arches of 510 feet span each. The roadway is 151 feet above the river level. On the approaches it is bordered by a handsome stone parapet with bronze ornaments. The bridge proper has an iron and bronze rail. William Hutton was the chief engineer, assisted by Theodore Cooper. In order to secure a number of meritorious plans, premiums were offered for the best design. The first and second prizes were awarded to designs by C. C. Schneider and William Hilderbrand, whose plans were followed as regards the general features of the bridge.

BRIDGES, Laws Governing Erection of. A bridge includes not only the structure erected over a stream to facilitate the passage over the stream, but the abutments, approaches and embankments by which the proper use of the structure is made possible. Public bridges are such as are built in public highways, and are a part of the highway. Bridge companies are sometimes organized under the laws of the various states for the purpose of erecting bridges for the use of the public, with the right to take toll for their reimbursement, but generally in this country, unless it be over navigable rivers, the duty of providing necessary bridges is imposed upon the towns, counties or districts in which the necessity may arise. Bridges may be erected over navigable streams by authority of Congress, or the state even, though navigation is thereby impaired, but if done without authority, the bridge may be treated as a public nuisance and abated. Even if authorized or built by the state, Congress, its power to regulate commerce being supreme, may interpose whenever it may deem it proper, and cause its removal. Generally, by statute, the duty of repairing bridges is imposed upon the town or county, or in case of private ownership, upon the person or corporation exercising such ownership, and upon failure to keep in good repair, any one suffering injury thereby will have a right of action if the defect be of such long standing as to raise a presumption of knowledge, or if actual notice has been given, and a reasonable time has elapsed thereafter in which to make the repairs. Parties chargeable with making repairs are liable to indictment upon neglect so to do, and in case a corporation is chargeable, it may be proceeded against by *quo warranto* for the forfeiture of its charter. Repairs may frequently be compelled by *mandamus* proceedings. Bridges are real estate, whether owned by individuals or by the public; yet, if owned by the public, the fee of the land over which it is erected is in its original owner, but subject to the easement of the public in passing over it. A private bridge is one erected for the use of one or more private persons. Such a bridge will not be considered public, even

though the public may be permitted to make use of it. The owner of a private bridge is not subject to indictment for failure to keep it in repair, even though the bridge be generally used by the public. See BRIDGES, Vol. IV, p. 284.

BRIDGETON, a city, port of entry and the capital of Cumberland County, southern New Jersey. It is situated on both sides of the Cohansey Creek, which is navigable from Delaware Bay to Bridgeton for vessels of 80 tons. It is on the Vineland railroad and a branch of the West Jersey railroad, 38 miles S. of Philadelphia and 11 miles from Vineland. The Bridgeton and Port Norris railroad runs southeastward to the mouth of the Maurice River—about 20 miles. Bridgeton has many churches and excellent public and private schools, including the South Jersey Institute, the West Jersey Academy and Ivy Hall for ladies; has a rolling-mill, nail factory, glass-works, woolen mills, leather factories, machinery works and a carriage factory. Population 1880, 8,722; 1890, 11,741; 1895, 13,292.

BRIDGEWATER, a village of Massachusetts, 27 miles S. of Boston; the seat of the Bridgewater Academy and of the Bridgewater state Normal School. It manufactures cotton-gins, cotton goods, iron, augers and paper. The state workhouse is in Bridgewater township. Population 1890, 4,249; 1895, 4,686.

BRIDGEWATER TREATISES, a series of treatises on the power, wisdom and goodness of God, as manifested in creation, written under the bequest of Francis Henry, eighth earl of Bridgewater; q.v., Vol. IV, p. 342.

BRIDGMAN, FREDERICK ARTHUR, an American artist and author, born in Tuskegee, Alabama, Nov. 10, 1847. While but a child he declared his intention of becoming an artist, and when only 16 years of age he went to New York and apprenticed himself to the American Bank Note Company, in the engraving department. He improved his leisure by studying in the Academy of Design in New York and in the Brooklyn Art School. At the age of 19 he went to Paris and enjoyed the honor of being one of the first American students of Gérôme. At 21 he sent *Jeu Breton* to the Paris Salon, and it was his fortune to have it hung "on the line." For several years he annually sent a painting to the Salon. *The Breton Children in Carnival Time; The American Circus in Brittany; Appollo Carrying Away Cyrene; Bringing in the Maize; The Funeral of a Mummy; Pastimes of an Assyrian King;* and *Procession of the Bull Apis*, were his contributions to the Paris Salon in 1869, 1870, 1872, 1877, 1878, and 1879. Many of his paintings were suggested by trips through the Pyrenees, excursions on the Nile and residence in Algiers. Since 1871 he has been a frequent exhibitor in the New York National Academy. To the United States Centennial Exposition he sent the three canvases, *A Kybelian Woman; Flower of the Harem*, and *The Nubian Story-Teller.* Mr. Bridgman was awarded a medal of the second class and decorated with the Legion of Honor at Paris in 1878; he was chosen a member of the New York National Academy of Design in 1881. His later works include *In a Villa at El Biar, Algeria*, which he sent to the Chicago World's Fair. He lives in Paris.

BRIDGMAN, LAURA DEWEY, blind deaf mute; born in Hanover, New Hampshire, Dec. 21, 1829; died in Boston, Massachusetts, May 24, 1889. When two years old a severe illness deprived her of sight, hearing and the sense of smell, and impaired her sense of taste. The difficult task of educating so unfortunate a child was intrusted to Dr. Samuel G. Howe of the Perkins Institution for the Blind (see BLIND, Vol. III, p. 830), in which school she spent most of her life, becoming eventually a successful teacher there. The methods employed in her training are of interest. At first objects were given her to handle, which bore their own name in raised letters; the words were then given her, and next the separate letters. These she was taught to put together to form words. The manual alphabet was next taught her, and then the use of a lead-pencil. Following this came instruction in arithmetic, geography (with relief-maps), sewing and housework. Her teacher was able to explain to her concerning the existence and character of God; her religious feelings were strongly developed after this, and she found much pleasure in reading her Bible. Her hand was more susceptible to sound vibrations than her ear. Her left eye was sensitive to a strong beam of light. Space-relations were not readily comprehended by her. She seemed to enjoy life, notwithstanding her great privations, was cheerful and of a social disposition, and for years was one of the chief attractions of the school.

BRIEF, in law, a concise, systematic memorandum of the points of law or of fact to be developed in argument or used in the examination of a witness. In English law, the name given to the written instructions on which barristers advocate causes in courts of justice. It is an abbreviated statement of the pleadings, proofs and affidavits at law, or of the bill, answer and other proceedings in equity, with a concise narrative of the facts and merits of the plaintiff's case or the defendant's defense. The object of a brief is to enable the person who tries a case to present his case properly before the court, or, where the brief is for the perusal of the court, to present the authorities bearing upon the questions involved and the claims made by the party presenting it. In most courts of review, or of appellate jurisdiction only, where the case is not originally tried before that court, complete briefs must be filed for the use of the court, containing all the information concerning the case which may be necessary for a proper understanding and determination of the case. In such courts briefs are generally required to be printed, to facilitate the labors of the court in arriving at its decision.

BRIEF PAPAL. See BULLS AND BRIEFS, Vol. IV, p. 519.

BRIENNE-LE-CHATEAU, a town of 1,900 inhabitants, in the French department of Aube,

on the right bank of the river Aube, 35 miles N.E. of Troyes. At the military school here (suppressed in 1790) the great Napoleon spent five years. Here, too, he was defeated by the allies, after a desperate struggle, in the last days of January, 1814. This victory opened the way to Paris, and led to the fall of the empire.

BRIENZ, a Swiss town, beautifully situated at the foot of the Bernese Alps, on the northeast shore of the lake of the same name, 30 miles S.E. of Berne. Population, 2,758. The lake of Brienz, which is 8¾ miles long and 1½ in breadth, is an expansion of the river Aar, and is believed to have been at one time united with Lake Thun. (See SWITZERLAND, Vol. XXII, p. 777.) It is surrounded by lofty mountains, the chief of which is the Rothhorn. In 1892 was opened the Brienz and Rothhorn railway, now the highest in Europe. It is 7,836 feet high at the summit level and ascends 5,606 feet, the journey occupying a half-hour. The gauge is .8 meter, and the railway is purely rack and pinion, on the Abt system. The steepest gradient is 1 in 4. There are 10 tunnels.

BRIGANDINE, a mediæval coat of mail. See CUIRASS, Vol. VI, p. 692.

BRIGANDS, a name originally given to the mercenaries who held Paris during King John's imprisonment (1358), and who made themselves notorious for their ill behavior. It was applied by Froissart to a kind of irregular foot-soldiery, and from them was transferred to common robbers; it is now used especially of such of these as live in bands in secret mountain or forest retreats. See BANDIT, in these Supplements.

BRIGANTES, the most powerful of the old British tribes, inhabiting the country between the Humber and the Roman Wall, which included what are now the counties of Cumberland, Westmoreland, Durham, York and Lancaster.

BRIGGS, CHARLES AUGUSTUS, an American theologian, professor in Union Theological Seminary; born in New York City, Jan. 15, 1841. He studied in the University of Virginia for three years, in Union Theological Seminary for two years, and at the University of Berlin for three years. On his return to the United States he became pastor of the Presbyterian Church at Roselle, New Jersey. In 1874 he was installed in the chair of Hebrew in Union Theological Seminary, New York City, and in January, 1891, was appointed to the chair of Biblical theology. In December, 1892, Dr. Briggs was tried before the New York Presbytery on six distinct charges of heresy, and was acquitted on each charge. At the 105th General Assembly of the Presbyterian Church of America, while in session at Washington, District of Columbia, June 1, 1893, the judgment of the New York Presbytery was reversed, and Dr. Briggs was declared guilty of having "uttered, taught and propagated views, doctrines and teachings contrary to the essential doctrine of Holy Scripture and the standards of the Presbyterian Church." The action of the Union Theological Seminary in retaining Dr. Briggs was condemned. It was his address upon his inauguration as professor of Biblical theology on the latter that gave rise to the heresy case, upon the grounds that it maintained these errors: First, that reason is a fountain of divine authority which may and does savingly enlighten men; second, that the church is a fountain of divine authority, which, apart from the Holy Scripture, may and does savingly enlighten men; third, that errors have existed in the original text of Holy Scripture as it came from the writers; fourth, that Moses was not the author of the Pentateuch; fifth, that Isaiah was not the author of the whole of the book of that name; sixth, that sanctification is not complete at death, but continues to advance. In 1884 he received the honorary degree of LL.D. from the University of Edinburgh, Scotland. He is the author of *American Presbyterianism* (1885); *Messianic Prophecy* (1886); *The Bible, the Church and the Reason* (1892); *The Higher Criticism of the Hexateuch* (1893); *Messiah of the Gospels* (1894).



DR. CHARLES A. BRIGGS.

BRIGGS, CHARLES FREDERICK, an American author; born at Nantucket, Massachusetts, 1804; died in Brooklyn, New York, June 20, 1877. He early removed to New York, where for many years he was connected with the press. The Brooklyn *Journal*, *Putnam's Magazine*, New York *Times*, *Evening Mirror*, Brooklyn *Union* and the *Independent* were papers with which he was successively connected. He was a humorous writer and fond of depicting New York life. He wrote *The Adventures of Harry Franco; A Tale of the Great Panic* (1839); *The Haunted Merchant* (1844); and *Trippings of Tom Pepper* (1847).

BRIGHAM, AMARIAH, an American physician; born in New Marlboro, Massachusetts, Dec. 26, 1798. He was at an early age left upon his own resources, and finding his way to Albany from Schoharie, he secured employment in a bookstore, where he remained three years. He returned to his native place and studied medicine, and began its practice in 1821, becoming widely known as a surgeon at Greenfield. In 1828 he visited Britain and the continent of Europe. Returning to America, he located in Hartford. Here revivals being in frequent progress, he raised his voice against them, on account of their injurious hygienic tendencies, and published his views on the subject in *Influence of Mental Cultivation on the Health* (1832), and *Influence of Religion upon the Health and Physical Welfare of Mankind* (1835). In 1840, in spite of much opposition, he was appointed superintendent of the Hartford Retreat for the Insane, and two years later accepted the offer of the superintendency in the New York State Asylum for the Insane at Utica. In this position he was also successful. In 1844 he founded the

*Journal of Insanity*, a quarterly publication. Among his other works are *Treatise on Epidemic Cholera* (1832); *Diseases of the Brain* (1836); and *Asylum Souvenir* (1849). He died in Utica, New York, Sept. 8, 1849.

BRIGHAM CITY, the capital of Boxelder County, northern Utah, on the Southern and Union Pacific railroads, 60 miles N. of Salt Lake City, at the west base of the Wahsatch range of mountains. Farming, fruit and stock raising, and the manufacture of woolen and leather goods are its industries. Population in 1896, 2,722.

BRIGHT, CHARLES TILSTON, an English engineer; born in West Ham, Essex, in 1832. He entered the service of the Electric Telegraph Company with his brothers while he was in his sixteenth year. Afterward he engaged with the British Electric and his brother with the Magnetic Company. By the agency of the brothers a fusion of both companies was brought about under the style of the British and Irish Magnetic and Telegraph Company. In his capacity of engineer to this company Charles had charge of laying the submarine cable between England and Ireland. In 1854 he succeeded in insulating 2,600 miles of wire so as to transmit messages, and, encouraged by these successes, he proposed to lay a cable from Britain to America. In 1856 Cyrus Field of New York met Mr. Bright in London, and an agreement was entered into between them and Mr. Brett and Mr. Whitehouse to undertake to materialize the suggestion. The money was raised, and the cable laid under the direction of Mr. Bright in 1858, for which service he was knighted. In 1864 he laid a cable to India *via* the Persian Gulf, established communication with the Antilles and thence with the Isthmus of Panama (1871). In 1865 he was returned to Parliament for Greenwich. In 1881 he was British commissioner to the international congress of electricians at Paris, and the same year was made an officer of the Legion of Honor.

BRIGHT, JESSE D., born in Chenango County, New York, Dec. 18, 1812; died May 20, 1875. He removed to Indiana, practiced law there, sat in the legislature in 1836, and in 1841 was elected lieutenant-governor of the state. In 1845 he was elected to the United States Senate as a Democrat, and sat until Feb. 5, 1862, when he was expelled for disloyalty. In 1866 he was a member of the Kentucky legislature.

BRIGHT, JOHN, an English statesman, son of Jacob Bright, a cotton spinner and manufacturer at Rochdale, Lancashire, was born at Greenbank, near that town, Nov. 16, 1811. The family were members of the Society of Friends, and Bright was educated at a Friends' school at Ackworth, and afterward at York and at Newton. While in his father's factory he took a great interest in public questions, and before he had attained his majority made speeches upon such subjects as capital punishment, church rates, temperance and Parliamentary reform.

In 1835 Bright made a foreign tour, and on his return delivered lectures on the subject of his travels, and on topics connected with commerce and political economy. When the Anti-corn-law League was formed in 1839 he was one of its leading members, and with Cobden engaged in an extensive free-trade agitation. In 1843 he became member of Parliament for Durham, and until their repeal, at public meetings and in Parliament was incessant in his opposition to the Corn Laws. (See COBDEN, Vol. VI, pp. 86, 88.) He was elected member of Parliament for Manchester in 1847. He strongly opposed the policy of the Crimean War (1854). A severe illness compelled him to withdraw for a time to the Continent, and in his absence he was rejected by his constituency. Elected in 1857 for Birmingham, he seconded the motion against the second reading of the Conspiracy Bill, which led to the overthrow of Lord Palmerston's government.

When the Civil War in America broke out, he warmly supported the cause of the North. In 1868 he became president of the Board of Trade, but in 1870 was again obliged to retire, in consequence of severe illness. His health having been restored, he took office in 1873, and again in 1881, as Chancellor of the Duchy of Lancaster; he was elected by the students lord rector of Glasgow University in 1880. Mr. Bright retired from the Gladstone ministry in 1882, being unable to support the government in its Home Rule and Egyptian policies, and became a Unionist. His subsequent appearances in public were infrequent; but in 1883 he defended himself in the House of Commons from a charge of breach of privilege in connection with speeches delivered at Birmingham. In 1885, at the general election, he was opposed by Lord Randolph Churchill in his candidature for his seat in Birmingham, but was triumphantly re-elected. Several volumes of his speeches, addresses and letters have been published. He died at his home, "One Ash," near Rochdale, March 27, 1889.

BRIGHT, RICHARD, an English physician; born at Bristol, 1789; died Dec. 16, 1858. He studied at Edinburgh, Berlin and Vienna, and from 1820 was connected with Guy's Hospital. He made many important medical observations and wrote numerous medical dissertations. (See MEDICINE, Vol. IV, p. 345.) His *Travels Through Lower Hungary* (1818) contains a valuable account of the gipsies.

BRIGHT, WILLIAM, an English theologian; born in Doncaster, Dec. 14, 1824; educated at Rugby and at University College, Oxford, where he was graduated in 1846. In 1847 he was elected fellow of his college and gained a scholarship and a prize in divinity. He applied himself to the study of divinity, and was ordained priest in 1850, and in 1851 became theological tutor in Trinity College, Glenalmond, Scotland. In 1859 he was appointed tutor in University College, Oxford, and was promoted in 1868 to be professor of ecclesiastical history and to the attached canonry of Christ Church; the next year the university conferred upon him the degree of D.D. Among his numerous works are *Ancient Collects from Various Rituals* (1857); *A History of the Church from the Edict of Milan to the Council of Chalcedon* (1860; 5th ed., 1888); *Select*

*Sermons of St. Leo on the Incarnation, with his "Tome," Translated, with Notes* (1862); *Faith and Life; Readings from Ancient Writers* (1864, 1866); *Hymns and other Verses* (1866, 1874); *Chapters of Early English Church History* (1878, 1888); *Later Treatises of St. Athanasius, Translated, with Notes and an Appendix* (1881); *Notes on the Canons of the First Four General Councils* (1882, 1892); *The Incarnation as a Motive Power* (1889, 1891); *Lessons from the Lives of Three Great Fathers* (1890); *Morality in Doctrine* (1892); *Waymarks in Church History* (1894); etc.

BRIGITTINES, or order of St. Bridget, a monastic order, founded in 1344 by St. Bridget of Sweden. See BRIDGET, ST., Vol. IV, p. 342; MONACHISM, Vol. XVI, p. 717.

BRIGNOLI, PASQUALE, an Italian singer; born at Naples in 1824; died in New York City, Oct. 30, 1884. He was given a fine musical education and became a talented pianist. He wrote an opera at the age of 16 and began his vocal training at 21, and encouraged by his concert-room success, appeared in opera in Paris, London and the United States. He sang with Mme. Patti on her first appearance in America. Brignoli possessed a tenor voice of great volume and sweetness.

BRIGUS, a town of Newfoundland, capital of the district of Brigus, and a port of entry, situated on Conception Bay, about 40 miles N.W. of St. Johns. The harbor is good, and the inhabitants are chiefly engaged in fishing. There is also a considerable trade in agricultural products. The principal buildings are the district jail and a convent of the Sisters of Mercy. Population, 2,000.

BRIHUEGA, a town of New Castile, Spain, situated on the Tajuña, 20 miles N.E. of Guadalajara. Population, 3,685. Here, in 1710, during the War of the Succession, the English General Stanhope, owing to the failure of his allies to afford him support, was defeated by the Duc de Vendôme, and compelled to surrender his force of about 5,500 men.

BRILL, a common European flatfish (*Rhombus lævis*), of the family *Pleuronectidæ*, belonging to the same genus as the turbot, from which it is distinguished by its being more elongated in form, by the absence of bony tubercles, by the small, almost smooth scales, of a brownish gray tint, sprinkled with pearly white spots. It is seldom above eight pounds in weight. It is much esteemed for food.

BRILLAT-SAVARIN, ANTHELME, a French gastronomist; born at Belley, April 1, 1775; died Feb. 2, 1826. He was a deputy in 1789, and mayor of Belley in 1793; for a time resident in Switzerland, he afterwards came to America, where he played in the orchestra of a theater in New York. Returning to France, he became a member of the court of cassation, which position he held from 1796 until his death. Shortly before this event appeared his *Physiologie du Goût* (1825), an elegant and witty compendium of the art of dining. It has been repeatedly republished and translated; the latest English edition being *A Handbook of Gastronomy*, with 52 etchings by Lalange (1884).

BRINDABAN OR BINDRABAN, one of the principal cities of the province of Muttra, India (q.v., Vol. XVII, p. 113). Population, 31,600.

BRINE-SHRIMP, a genus of small animals (*Artemia salina*), found in brackish water and in brine. See CRUSTACEA, Vol. VI, p. 663.

BRINK, BERNHARD EGIDIUS KONRAD TEN, a German philologist; born at Amsterdam, Jan. 12, 1841; studied philology at Münster and Bonn; in 1870 became professor of modern languages and literature at Marburg, and in 1873 professor of English philology at Strasburg. Among his works are *Chaucer-Studien* (1870); *Geschichte der Englischen Literatur* (1874; English translation, 1883); *Chaucer's Sprache und Verskunst* (1884), and *Beowulf* (1888). He died at Strasburg, Jan. 29, 1892.

BRINK, JAN TEN, a Dutch writer; born June 15, 1834, at Appingadam; studied theology at Utrecht, but early devoted himself to literary pursuits. After a short residence at Batavia, he returned in 1862 to teach Dutch at The Hague, and since that time he has earned for himself a prominent place as a critic, especially in the department of fiction and *belles-lettres*. A popular novel of his is *Het Verloren Kind* (1879), and his *Causerien over Moderne Romans* (1885) is a valuable critique of modern novels.

BRINKLEY, a town in Monroe County, east-central Arkansas, at the junction of four railroads, and about 65 miles E. of Little Rock. It has large railroad shops and considerable manufactures of wood, oil and cotton. Population 1890, 1,519.

BRINTON, DANIEL GARRISON, an American ethnologist and archæologist; born in Thornbury, Pennsylvania, May 13, 1834. He was graduated at Yale in 1858, and at Jefferson Medical College in 1861, from which he went to Germany for further study, and returned to volunteer for service in the Civil War, becoming a Union army surgeon, and rising to the medical directorship of the Eleventh Army Corps. He was disabled from active service by a sunstroke, and was made superintendent of hospitals at Quincy and Springfield, Illinois, receiving his discharge in 1865, with the brevet rank of lieutenant-colonel. He took up his residence in Philadelphia, and soon became immersed in the study of the philology, mythology and antiquities of the native American races, in which he achieved great distinction, in 1886 being awarded the medal of the Société Americaine de France for his numerous and important contributions to American ethnology. In 1884 he was appointed professor of ethnology in the Academy of Natural Sciences, Philadelphia, and in 1886 professor of American linguistics and archæology in the University of Pennsylvania. In the latter year he was elected vice-president of the American Association for the Advancement of Science, presiding over the section of anthropology. He is also president of the Numismatic and Antiquarian Society of Philadelphia. His first work was *Notes on the Floridian Peninsula: Its Literary History, Indian Tribes*



DANIEL G. BRINTON.

*and Antiquities* (1859). His other works include *The Myths of the New World; an Essay on the Symbolism and Mythology of the Red River of America* (1868); *The Arawack Language of Guiana in Its Linguistic and Ethnological Relations* (1871); *American Hero-Myths; A Study in the Native Religions of the Western Continent* (1882); *Library of Aboriginal American Literature; Aboriginal Authors and Their Productions, Especially Those in the Native Languages* (1883); *The Iroquois' Book of Rites* (1883); *A Migration Legend of the Creek Indians* (1884); *A Grammar of the Cakchiquel Language of Guatemala, Translated from a MS., with an Introduction and Additions* (1884); *The Lenape and Their Legends* (1885); *The Annals of the Cakchiquels* (1885); *The Lineal Measures of the Semi-Civilized Nations of Mexico and Central America* (1885); *On the Ikonomatic Method of Phonetic Writing, with Special Reference to American Archæology* (1886); *Conception of Love in Some American Languages* (1887); *Prehistoric Chronology of America* (1887); *Races and Peoples* (1890); *Essays of an Americanist* (1890); *The American Race* (1892).

BRINVILLIERS, MARIE MADELEINE, MARQUISE DE, poisoner, was the daughter of Dreux d'Aubray, lieutenant of Paris, and in 1651, while still young, was married to the Marquis de Brinvilliers. She afterwards became infatuated with a handsome young officer, the Seigneur de Sainte-Croix. Her father caused him to be imprisoned in the Bastille, where he learned from an Italian the properties of arsenic. On his release he imparted this knowledge to his mistress, who, to test the efficacy of the poison, tried its effects on patients in the Hotel Dieu. Having satisfied herself, she resolved to destroy her father, and after eight months of slow poisoning she administered a dose which caused his death. No one suspected his daughter, who, with the assistance of Sainte-Croix and a domestic, next poisoned her two brothers and her sisters; her object being to procure means of continuing her extravagant style of living with her paramour. She made several attempts to poison her husband, but Sainte-Croix is said to have administered antidotes, dreading that he should be compelled to marry the widow. Sainte-Croix died suddenly in 1672, and left documents inculpating the marchioness. She escaped to England, afterwards traveled in Germany, and finally took refuge in a convent at Liège. From this, however, she was decoyed by an officer of justice disguised as an abbé, and conveyed to Paris. Among her papers was found a general confession of her crimes, the truth of which she acknowledged on being put to the torture, and on July 16, 1676, she was beheaded at Paris. See GLASER, Vol. X, p. 637.

BRIQUETTE-MACHINE. The manufacture of briquettes, or coal-bricks, is carried on quite extensively in large cities in England and the Continent. They are usually made in sizes varying from three fourths of a pound to three pounds in weight. Pulverized coal, with pitch, or occasionally some other binding material, are the ingredients. The machines for their manufacture produce from half a ton to five tons per hour, according to size, and consist of several mechanisms combined. The materials are first fed to the mixing and measuring part of the machine, where the percentages of coal and pitch are determined by the sizes of change-wheels used. From this mixer the materials fall into a disintegrator, inside which are steel cages fitted with steel bars. Being rotated oppositely at a high speed, the cages quickly grind the whole mass, which is next carried by a little elevator to an upright heater, where steam is applied. After the mass is softened by the heat, it passes to a pug-mill, and then to a molding-machine, much as clay is handled in the so-called "soft-mud" machines. The briquettes are usually cast with round corners, to avoid waste by chipping in handling. C. H. COCHRANE.

BRISBIN, JAMES S., born in Pennsylvania in 1838. He became widely known as an antislavery speaker, and entered the volunteer service as a private in 1861, and came out major-general of volunteers and brevet colonel in the regular army. He was transferred to the cavalry and was promoted colonel of the First cavalry in August, 1889. He died in Philadelphia, Jan. 14, 1892.

BRISSON, EUGÈNE HENRI, a French politician; born at Bourges, July 31, 1835. He studied law in Paris and was called to the bar in 1859. He wrote for the *Temps* and the *Avenir National;* and in 1868, with MM. Lacour and Allain-Targé, established the *Revue Politique.* After the revolution of Sept. 4, 1870, he was appointed deputy mayor of Paris by the Government of National Defense, but resigned October 3d. In 1871 he was elected to the National Assembly as a representative of the Seine, and submitted a proposition for amnesty for all political crimes, but this was considered a premature measure. In 1896, at the general election, he was elected for the tenth arrondissement of Paris and was one of the 363 deputies who refused a vote of confidence in the Broglie cabinet. He was elected vice president of the Chamber in 1879, and was named president of the Budget Commission. He succeeded M. Gambetta as president of the Chamber, Nov. 3, 1881, and was re-elected to this position in 1883. On the fall of M. Ferry he accepted the office of Premier (1885), but gave place after a few months to M. de Freycinet. On the death of M. Burdeau, December, 1894, M. Brisson was elected president temporarily, and in January, permanently, president of the Chamber, this being his third period in the office. Upon the subsequent resignation of the President of the republic, M. Casimir-Périer, M. Brisson was a candidate for the succession and lacked only 60 votes on the first ballot of election. On the second ballot, M. Waldeck-Rosseau having retired in favor of M. Faure, the vote stood 430 for the latter and 361 for M. Brisson.

BRISTED, CHARLES ASTOR, an American author; born in New York City, Oct. 6, 1820. He was graduated at Yale in 1839, and spent five years at Trinity College, Cambridge, England, where he distinguished himself and was made a foundation scholar of his college. He then became known to magazine-readers as "Carl Benson." His mother was an Astor, and he was an original trustee of the Astor Library in New York City. He traveled extensively in Europe, and on his return to the United States

settled in Washington, District of Columbia, where he died, Jan. 15, 1874. Among his works are *Five Years in an English University* (1851, 1872); *The Upper Ten Thousand* (1852); *Pieces of a Broken-Down Critic* (1858); *The Interference Theory of Government* (1867); and *Anacreontics* (1872).

BRISTED, JOHN, an American clergyman and author; born in Dorsetshire, England, in 1778. He studied medicine and law in Edinburgh and London, and removed to the United States in 1809, and practiced law successfully. He married, in 1820, a daughter of John Jacob Astor. He studied divinity, in 1828 was ordained, and next year became rector of St. Michael's, Bristol, Rhode Island, remaining there 14 years. He was the author of *Critical and Philosophical Essays* (1804); *The System of the Society of Friends Examined* (1805); *Resources of the British Empire* (1811); *Resources of the United States* (reprinted in London as *America and Her Resources* (1818); *Thoughts on the Anglican and Anglo-American Churches* (1823). He died in Bristol, Rhode Island, Feb. 23, 1855.

BRISTOL, a manufacturing village of Hartford County, west-central Connecticut, about 20 miles W. of Hartford. It has manufactories of clocks, water-wheels and stockings, and several foundries and machine-shops. Copper is found in the vicinity. Population 1890, 7,382.

BRISTOL, capital of Liberty County, north-central Florida, on the Appalachicola River, about 25 miles below Chattahoochee. It manufactures lumber, and 1890 had a population of 363.

BRISTOL, a town of Sullivan County, northeastern Tennessee, situated on the boundary line of Virginia, about 130 miles E. of Knoxville. That part of the town which lies in Virginia is known as Goodson. Here are important manufactories of machinery, brooms, flour, tobacco, veneer, canned goods, cottons, woolens, iron and lumber. Bristol is the seat of King and Sullins colleges, and Southwest Virginia Institute for Young Ladies. Population 1890, 6,226.

BRISTOL, AUGUSTA COOPER, an American authoress and educator, born at Croydon, New Hampshire, April 17, 1835. She received her education at Kimball Union Academy and became a teacher. She had written poetry at the age of nine, and continued to devote herself to that class of literature. She next began to lecture on moral and social topics, and in 1880 was sent to France to study the equitable association of capital and labor at Guise, where she resided three months, thoroughly mastering the subject. Returning home, she was elected state lecturer by the Patrons of Industry in New Jersey, holding the position until 1884, when, the work having become of national importance, she was sent to visit different states. She published a volume of *Poems* (1868); *The Relation of the Maternal Function to Woman's Intellect* (1876); *The Philosophy of Art* (1878); *Science and Its Relation to Human Character* (1878); *The Present Phase of Woman's Advancement* (1880); *Laws and Regulations of the Mutual Assurance of the Institution at Guise* (1881).

BRISTOL BAY, an arm of Bering Sea, lying immediately to the north of the peninsula of Alaska. It receives the water of two large lakes, by which communication with the interior is opened up for a considerable distance.

BRISTOL CHANNEL, an inlet to the Atlantic Ocean, in the southwest of England, between South Wales on the north and the counties of Devon and Somerset on the south. It is about 80 miles long, and 5 to 43 miles broad, the depth ranging from 5 to 40 fathoms. It is the largest inlet in Britain. The tide in Bristol Channel rises to a height of 40 feet, and has been known to reach a maximum of 70 feet.

BRISTOW, BENJAMIN HELM, an American statesman; born in Elkton, Todd County, Kentucky, June 20, 1832. He graduated at Jefferson College, Pennsylvania, entered the legal profession and practiced in Kentucky. He enlisted in the Union army and served throughout the Civil War. He successively held the offices of state senator, elected while still in the field (1863–65); United States district attorney for the Louisville district (1865–70); Solicitor-General for the United States (1870–72); attorney for the Texas Pacific railroad; Secretary of the Treasury under President Grant (1874–76, when he resigned), becoming conspicuous during his brief term for his persistent prosecution of those attempting to defraud the government, especially those connected with Star Route contracts in the postal department. In 1876 he was one of the candidates for Presidential nomination. He died June 22, 1896.

BRISTOW, GEORGE FREDERICK, an American musician; born at Brooklyn, New York, Dec. 19, 1825. He received his early training from his father, an Englishman, who was a musician. Bristow became a member of the New York Philharmonic Society, and composed several pieces for the society, which produced his *Praise to God* (oratorio, 1866). His best work was the opera *Rip Van Winkle*, produced at Niblo's Theater in 1853. He has also composed *The Great Republic* (cantata, 1862); *Daniel* (oratorio, 1867); and *Columbus* (opera, 1878).

BRISTOW STATION OR BRISTOE, a village of Prince William County, northeastern Virginia, on the Occoquan River, and on the Orange and Alexandria railroad. Two battles were fought here between the Confederate and Union forces, one on Aug. 27, 1862, the other Oct. 14, 1863.

BRITANNIA METAL, an alloy (see PEWTER, Vol. XVIII, p. 725) of which the essential metal is tin, with varying proportions of antimony and copper, to which bismuth, zinc and lead are occasionally added. This alloy is extensively used for tableware, being thinly coated with silver and sold as silver-plate. The manufacture was begun at Sheffield in 1770, and Sheffield and Birmingham are still the chief seats of the manufacture. In 1824 it was made in Taunton, Massachusetts, by Isaac Babbitt. Since electroplating came into general use the trade in Britannia metal wares has greatly increased.

BRITISH ASSOCIATION, an association whose object is, by bringing together men eminent in all the several departments of science, to assist in the progress of discovery, and to diffuse the latest results of scientific research. The honor of being its founder belongs to Sir David Brewster. (See BREWSTER, Vol. IV, p. 277.) The second meeting took

place at Oxford in 1832, and from this date it may be said to have been in complete and successful operation. The annual meeting takes place about the end of August and lasts more than a week. In 1882 an effort was made to form an international convention of scientific associations. Many of the successive presidents have been men of social and scientific eminence. A volume is published annually, containing reports on the progress of science, addresses delivered, papers and abstracts of papers read at the meetings, and copies are presented to societies and libraries at home, in the colonies and abroad. See also SOCIETIES, Vol. XXII, p. 222.

BRITISH CENTRAL AFRICA. See AFRICA, in these Supplements.

BRITISH COLUMBIA. The Canadian province of British Columbia, which includes the island of Vancouver and the group to the north of it, known as the Queen Charlotte Islands, occupies the mountainous district extending to the Pacific Ocean from the western edge of the prairie country east of the Rocky Mountains. The general surface of the province is broken, consisting of short ranges, detached groups of mountains, elevated plateaus, and many fertile valleys, of various extent, full of auriferous wealth. Its area is estimated at 383,300 square miles, fully two thirds of which is covered by the finest and most valuable timber. It has over 7,000 miles of coast-line, seamed with fiords and inlets, which, with its great rivers, are literally packed with fish. At Nanaimo, on Vancouver island, there are vast measures of the finest bituminous coal; while the province has another great source of wealth in the peltry trade, including the furs of the seal, sea and land otter, deer, elk, beaver, marten, and silver and sable fox. Its fisheries, which are probably the richest and most prolific in the world, have, moreover, created great canning industries, of salmon, sturgeon, halibut, cod, oulachan (candle-fish) and trout, and given rise to a trade destined to be one of vast wealth. This enterprise has grown up within the last twenty years—the value of the fish catch in 1876 being only $104,000, while that of 1894 amounted to close upon four million dollars. During twelve years (1883–94) the value of the salmon catch alone exceeded twenty-one million dollars; the value of that for 1893 was $3,150,709. The coast sealing-trade is another source of provincial wealth, the catch of seals, exclusive of those taken in Bering Sea, being, in 1893, 28,809. Owing to the restrictions happily since put upon the trade, the catch off the British Columbian coast was, in 1894, only 11,703. The total Pacific catch of seals landed during the season of 1895 at Victoria, British Columbia, was 73,614. The growth of the fishing industry in British Columbia is illustrated by a comparison of the number of men engaged in the trade in the year 1881 with the number engaged in 1894. In the former year there were only 62 men in vessels and 2,831 in boats; in the latter year, there were 1,735 engaged in vessels and 10,915 in boats. A like increase marks the difference in the value of the vessels, boats, nets, fish-houses, etc., engaged in the trade in 1883 and 1894. The increase in cost of equipment between the years is close upon a million and a quarter dollars.

The statistics of coal-mining in the province show like gratifying progress. In 1888 the number of men and boys employed in this industry was 2,012, and the output of coal 489,300 tons, giving an average of 243 tons per man. In 1894 (only six years later) the number of men employed was 2,929, and the coal raised was 1,134,507 tons, giving an average of 387 tons per man. Of this quantity raised, which in quality is found to be superior for all practicable purposes to any on the Pacific Coast, the province exported, in 1894, 716,304 tons. Gold-mining in British Columbia is also a valuable industry, which in the last 38 years has, it is estimated, yielded over $54,000,000. The estimated value of the British Columbian yield of the precious metal for the year 1894 is placed at $456,066, of which $380,055 is known to have been exported. The richness of the silver deposits in the Kootenay district gives promise of a large yield, in the near future, of this metal. Rich deposits of iron ore have recently been discovered in the province.

The forest stretches of the province, hardly as yet touched, is another promising source of wealth, chiefly in the demand for masts and spars from the giant cedar and lordly Douglas pine of the Pacific Coast. Trees whose stems are 300 feet in height, with proportionate girth, are to be found everywhere over the province. Vancouver, the enterprising coast terminus of the Canadian Pacific railroad, has only of recent years been cleared of such trees to make way for the life and movement of a great city. Twelve years ago, its site was a dense forest of stately pine, and now the city covers an area of 16 square miles, with an estimated population of 18,000. From its wharves a large and varied array of shipping traffic with all parts of the coast, as well as with the distant ports of Australia, China and Japan. New Westminster, at the mouth of the Fraser River, is another fast-growing city of the province, with an estimated population of 8,000. Victoria (population in 1891, 16,841) is the capital. It is situated at the extreme southeast of Vancouver Island, 70 miles, across the Straits of Georgia, from New Westminster. Near by is the magnificent harbor of Esquimalt, the imperial naval station of the North Pacific squadron. Seventy miles farther north is Nanaimo, which has also a good harbor, and is the headquarters of the deep-sea and whale fisheries, and the seat of the rich island coal trade.

A great impetus has naturally been given to the trade of the province since the completion, in 1886, of the transcontinental line of the Canadian Pacific railroad, which gave political consolidation to the Dominion, and opened up mail, passenger and trade routes to Japan and Australia. It has also been of great benefit to Canada, in enabling it to tap the wealth of the Pacific seaboard and give an eastern outlet to the vast natural resources of the province.

The government of the province is administered, under a lieutenant-governor, by an executive composed of five members, responsible to a legislature of 31 members. The province is represented in the Dominion Parliament by three members in the Senate

and six in the Commons. The estimated revenue of the province for the year ending June 30, 1896, is $1,035,989, and the expenditure $1,312,777, of which sum about $200,000 represents the payment for interest and sinking fund on account of the public debt. The latter, in 1894, amounted to close upon $4,000,000. The value of the total imports (free and dutiable) of the colony in 1894 was $5,190,359, on which a duty of $1,189,414 was collected. Education in the province is free, undenominational, and entirely supported by government. In 1894 there were 157 common schools, 24 graded schools and 4 high schools in operation, with a total average attendance of 3,379 pupils. The amount expended by the government on education for the year was $195,912. The population of the colony in 1891 was 98,173, of which about one third were Indians and Chinese. The religious statistics of 1891 give the following as the strength of the respective denominations: Church of England, 23,619; Roman Catholics, 20,843; Presbyterians, 15,260; Methodists, 14,193. See also Vol. VI, pp. 169, 170.

G. MERCER ADAM.

BRITISH AND FOREIGN ANTISLAVERY SOCIETY, a society founded in 1839, that carries on the work of previous societies of the kind, the need for which had ceased to exist in English-speaking countries. The objects the society encourages are "the univeral extinction of slavery and the slave trade, and the protection of the rights and interests of the enfranchised population in the British possessions, and of all persons captured as slaves." In 1895 the society sent out a special commissioner to East Africa and the Red Sea. He was in all probability the first European to travel through the interior of Pemba Island, and his report on that island is thus of great interest. The Prince of Wales is a patron of the society, which publishes a journal, *The Antislavery Reporter*, published in London.

BRITISH GUM. See DEXTRIN, Vol. VII, p. 146.

BRITISH MUSEUM, THE. What is now known, all the world over, as the British Museum, well termed by the eloquent author of *Ecce Homo*, "one of the greatest seats of learning in England, and the staff which is employed by the state to take charge of that vast national collection, one of the most brilliant of learned bodies," is deserving of further and more detailed consideration than is given it in the many references scattered through the 24 volumes of this ENCYCLOPÆDIA. The daily accessions to the library and reading-room under the provisions of the copyright laws, the priceless incunabula and literary rarities on its shelves and in its show-cases, the triumphs of art and the treasures of antiquity grouped in its lofty corridors or displayed in its grand rooms, have long rendered the British Museum a Mecca for the cultured of every nation.

In the vast rotunda of its reading-room, beneath a dome second only to that of the Roman Pantheon, and surrounded by 25 miles of book-shelves, with 1,600,000 volumes at command, the successful descendant of sturdy colonial sires may be found delving into the genealogy of his Elizabethan ancestry, and seated next to him perhaps a London clergyman "gathering a posie of other men's flowers, with nothing but the string that binds them for his own," for next Sunday's sermon.

Savants and scholars of every clime resort to its shelves and galleries, and it is included in the itinerary of the cultured traveler from every land. Here alone can be seen the original of the Magna Charta, wrung from an unwilling king to form the corner-stone of liberty wherever the Anglo-Saxon tongue is heard. Here is a mortgage deed signed by the Bard of Avon, and the finest copy extant of the first edition of the dramas which have crowned his name with immortality. Caxton's "Fifteen O's,"—as the curious black-letter book of 15 prayers, all commencing with this exclamation, is termed,—with its quaint woodcut of the crucifixion, and numerous other examples of England's first printer's work, are displayed beside John Milton's contract with his publisher; a proof-sheet of one of Tom Moore's melodies; a copy of Luther's Wittenberg Theses; and letters of Columbus in relation to the discovery of America. Priceless rarities are on



THE BRITISH MUSEUM.

every hand. In the Gold Room at the head of the main stairway—for the Museum is too antiquated in style to allow elevators—the golden torque and *bullæ* of a long-forgotten Bretwalda rest beside the rare "Portland" vase, brought here from its resting-place beside the ashes of a Roman emperor.

Accessions, and the demands of increasing visitors, have made many changes in the British Museum since the preparation of the account given under LIBRARIES, Vol. XIV, p. 515. Just as the little room to which in 1759 only five readers cared, or were sufficiently influential, to obtain access gave place to the vast reading-room, with every convenience, for 300 students and the library staff, so before the close of 1880 the necessity for additional buildings was demonstrated by a daily average attendance of 640 readers. The verdant lawns of the building were encroached upon, and to-day, where the museum employees mustered in 1848 with half a hundred soldiers to repel the expected Chartist attack, a handsome block of buildings holds the vast collection of rare manuscripts and sets of newspapers, and contains reading-rooms for those consulting these archives of the world's history. New art-galleries were added in 1883, and a grand Assyrian room was dedicated to the public use the following year.

The snow-white Ionic main structure, with its grand columnar façade 370 feet in length, contains eight departments; viz., Printed Books, Manuscripts,

Oriental Printed Books and Manuscripts, British and Mediæval Antiquities and Ethnography, Greek and Roman Antiquities, Coins and Medals, Prints and Drawings, Egyptian and Assyrian Antiquities. A brief notice of the principal contents of these is as follows:

*Printed Books.* These form the largest department in the museum. The Sloane collection, and a much smaller one bequeathed to the nation in 1738 by Major Edwards, formed the nucleus. In 1757 George II gave to the Museum the library collected by the kings of England from Henry VII downwards, the gift including the libraries of Cranmer and Casaubon. With the gift of the royal library, the same sovereign conveyed to the Museum the right to a copy of every publication entered at Stationers' Hall. A number of private donors, chief among whom where Dr. Bentley and Sir Joseph Banks, swelled the contents of the library. In 1823 came the gift of George IV. Its value was nearly $1,000,000, and by the terms of the gift it is kept separate from the other books, being known as the Kings' Library. In 1846 the Right Hon. Thomas Grenville bequeathed to the Museum his own library, containing more than 20,000 volumes. On the shelves of the library are to be found the rarest and most precious books, among them being copies of the first edition of almost every famous English work extant. Of some there are copies of many editions—e.g., of the *Pilgrim's Progress*, 75 in English, and 29 in other languages; of the *Paradise Lost*, 72 in English and 52 in other languages; of *Robinson Crusoe*, 100, of which 74 are in English. The catalogues form quite a library in themselves, as may be conceived from the fact that the heading *William Shakespeare* alone fills two volumes.

By purchases, bequests and donations, the library has become one of the first in the world, containing now about 1,600,000 printed volumes. During the year 1895 there were added 35,000 volumes, including music and volumes of newspapers, of which 3,946 were presented, 16,953 purchased, 11,548 acquired by home copyright, and 1,397 by international copyright. There were also added 5,296 pieces of music, and about 2,200 sets of newspapers.

A catalogue of the printed books, in seven octavo volumes, was published in 1813–19. So great have been the additions to the collection, that in 1880 the general MS. catalogue occupied upwards of 2,000 volumes folio. The adoption in that year of the plan of printing the title-slips has checked this rapid rate of growth, and a printed catalogue is now in progress. At the end of 1887, 169 printed volumes had taken the place of 633 in manuscript, and it is calculated that the beginning of the twentieth century will see the whole of the catalogue represented by some 600 printed volumes. The adoption of printing has also facilitated the commencement of a subject catalogue of all new acquisitions, and the first installment of this was issued in 1886. Another important catalogue issued by this department is that of old English books published previously to 1641, a work of the highest bibliographical importance.

*Maps.* There are over 50,000 published and 20,000 manuscript maps in the museum. A catalogue of these in two large quarto volumes has been published.

Cowtan, in his *Memories of the British Museum* (1872), gives the interesting and curious inside history of the much-advertised gift of the Kings' Library by the last of the Georges. The monarch, pressed for money, had agreed to sell the books to the Emperor of Russia, when Heber, the famous bibliograper, aghast at the despoliation of his country, and backed by the wealth and personal influence of Lord Sidmouth, prevailed upon the King to *present* the books to the British Museum, receiving the price of sale from funds paid by France for English losses in the Revolution. Even then the sordid Hanoverian retained the two most celebrated Caxtons, which are to-day in the Royal Library at Windsor Castle.

*Manuscripts.* The manuscripts are contained in several rooms in the southeast angle of the building. The collection consists of—(1) The Sloane manuscripts, relating chiefly to medical and natural history subjects. (2) The Cotton manuscripts, rich in documents referring to the history of Britain, including two of the originals of Magna Charta, in registers of English monasteries, and in original letters of royal and illustrious personages This collection contains the *Durham Book*—a copy of the Latin Gospels with an interlineary Saxon gloss, finished in the year 720. (3) The Harleian manuscripts, a collection rich in illuminated MSS., in ancient, civil and ecclesiastical records, in manuscripts of the classics, among which is one of the earliest known copies of the *Odyssey*, and in early English poetry. (4) The manuscripts of the Ancient Royal Library. These were collected by our kings, from Richard II to George II; many of them were obtained from the monasteries at the dissolution. Amongst the most valuable treasures here are the *Codex Alexandrinus*, a manuscript of the Bible written in uncial Greek before the close of the fifth century, and the *Basilicon Doron* of James I, in his own handwriting. (5) The Lansdowne manuscripts. This collection comprises the Burghley and Cæsar papers, the manuscripts of Bishop Kennett, and numerous valuable historical documents and state papers. (6) The Hargrave manuscripts, almost exclusively connected with law. (7) The Burney manuscripts, containing a large collection of the Greek and Latin classics. Among them is a copy of the *Iliad*, answering that of the *Odyssey* in the Harleian collection. (8) The Howard-Arundel manuscripts, obtained from the Royal Society. This collection is singularly rich in materials for the history of England and its language. (9) The Oriental manuscripts, a collection composed of several purchases and bequests. It includes the manuscripts acquired by Mr. Rich while consul at Bagdad, and consists of numerous Syriac, Arabic, Ethiopic, and other Oriental codices. A large series of Ethiopic manuscripts was obtained at Magdala on the occasion of the Abyssinian War. (10) Additional manuscripts. This collection consists of innumerable bequests, donations and purchases, which from the establishment of the Museum have been and are still being acquired. Catalogues of the complete collections have long been in existence, while that of the additional manuscripts is continually being increased by fresh volumes. Separate catalogues have also been issued of the collections of Greek and Latin, and also of Persian manuscripts, and a valuable catalogue of romances is in progress. The most important recent additions to the department have been the purchase of the Stowe manuscripts from Lord Ashburnham, and the gift by the Earl of Chichester of the Duke of Newcastle's papers, in 430 volumes. In 1887 the department contained upward of 50,000 volumes, 47,000 charters and rolls, nearly 10,000 detached seals and casts of seals, and upward of 100 ancient Greek, Coptic and Latin papyri.

*British and Mediæval Antiquities and Ethnography.* In this department are to be found antiquities anterior to the Roman occupation of Britain, antiquities of the Roman period, Anglo-Saxon antiquities and sculptures, carvings, metal-work, enamels, glass, pottery, etc., of different European nations down to the seventeenth century. There is also a small collection of antiquities found in the catacombs of Rome, and relating to the early Christians. The ethnographical collection includes both the antiquities and the objects in modern use belonging to all nations not of European race.

*Egyptian and Assyrian Antiquities.* These include monuments of the early eighth and nineteenth dynasties of Egypt, of Rameses II, of the later dynasties of the Greek, Roman and Coptic periods; the Rosetta stone; sculptures from Khorsabad, Nimrûd, Nineveh, and the palaces of many kings of the Assyrian empire; mummies and mummy-cases, etc.; Babylonian bricks, terra-cottas, etc.

*Greek and Roman Antiquities.* The most famous of the Grecian antiquities contained in this collection are the Lycian Gallery, consisting of a number of bas-reliefs, friezes, etc., brought from the ancient cities of Lycia, in Asia Minor, in 1842–46, by a British government expedition under the direction of Sir C. Fellows; the Elgin Marbles, collected by the seventh Earl of Elgin in 1801–03 and

purchased from him in 1816 by the nation for $185,000; and the Hellenic Marbles, obtained in various parts of Greece (exclusive of Attica) and its colonies. The most valuable of the last is a collection, known as the Phigalian Marbles, discovered in 1812 amongst the ruins of the temple of Apollo Epicurius, near the ancient city of Phigalia, in Arcadia. In 1874 there were added a number of valuable inscriptions, excavated by Mr. Wood on the site of the Temple of Diana at Ephesus. Of the Roman collection, one of the leading features is the gallery containing the Townley Marbles, purchased for $100,000 in 1805, after the death of Mr. Charles Townley, by whom they were collected. They consist of a number of statues and busts. The other Roman antiquities consist principally of vases called Etruscan, bronze ornaments and weapons, lamps, urns, etc., as well as architectural fragments.

*Coins and Medals.* In this department is arranged an immense number of coins, etc., of every age, the Roman and Anglo-Saxon collections being the most noteworthy. The arrangement of the department is most excellent.

*Prints and Drawings.* Down to 1840 the collections of this department consisted entirely of bequests, but since that date extensive purchases have been made, and there are now to be seen here drawings and engravings illustrative of all the schools of European art. It is peculiarly rich in early Italian and early German and Dutch and Flemish engravings. Among the drawings are fine examples of Raphael, Michael Angelo, Leonardo da Vinci, Albert Dürer and Claude; among the water-colors, of David Cox, Girtin and W. Müller. The collections of etchings by Rembrandt and of engravings by Hogarth are alike unrivaled. There is also an extensive collection of English and foreign portraits and of satirical prints. A large number of Japanese drawings and paintings have recently been acquired, and of these a catalogue was issued in 1887.

The Museum is under the management of forty-eight trustees, the chief of whom are the Archbishop of Canterbury, the Lord Chancellor, and the Speaker of the House of Commons, a trusteeship being esteemed one of the blue ribbons of literature. The staff of the museum consists of the principal librarian, 8 heads of departments and a large staff of principal officers, assistants and attendants, etc.—in all, 322 persons. The total sum voted for the maintenance of the establishment and all other expenses during the financial year 1894–95 was $761,395. The museum is open free to the public daily from 10 a.m. till dusk, and in the evening from 8 to 10 on every week-day. The British and Mediæval Antiquities and rooms in "White Wing" are closed on Tuesdays and Thursdays. The reading-room is open daily, September to April, 9 till 8 p.m.; May to August, till 7 p.m., lighted after dusk by electric light. The print-room and sculpture-galleries are open daily to persons holding tickets, the former from 10 till dusk, and the latter from 9 till the hour of closing. Since the adoption (1880) of electric light in the reading-room, the number of readers has greatly increased, and in 1895 they reached the enormous total of 430,000. The number of books consulted by these readers was 1,189,680.

To-day the Museum stands complete and unrivaled, threatened only by the ceaseless demands for more space for its increasing treasures, being located in a closely inhabited district, in place of the green fields and gardens of eight acres which, long after the time of Evelyn, formed a picturesque suburb of London, where duelists met and cattle browsed. It has justified the words of its first librarian, Sir Frederick Barnard, and is a "perpetual monument of the munificence, judgment and liberal taste of its royal founder, a splendid ornament to the throne, and a perpetual benefit to learning." Its officials, appointed for life, have, since its foundation, given their untiring work to its success. The labors of Panizzi, Bond, Garnett, and Thompson will be, as St. Paul's was to its architect, Wren, their monument, and the world, as well as the nation, the recipients of lasting benefits therefrom.

The authorities dealing with the Museum are numerous. In addition to the official guides and handbooks sold to visitors at the entrance of the building, and Cowtan's interesting *Memories* (1872), Nichol's *Handybook of the British Museum* (1870) and Sims's masterly *Handbook to the Library of the British Museum* are standard authorities, to each of which the writer is indebted for many of the facts contained in this article.

BRITISH NORTH BORNEO. See SABAH, Vol. XXI, p. 123.

BRITON FERRY, a seaport of South Wales, in Glamorganshire, at the mouth of the river Neath, 2½ miles from the busy town of Neath, to which it serves as a port. Population of parish, 6,061.

BRITONS, ancient inhabitants of Britain. See BRITANNIA, Vol. IV, p. 352.

BRITTLE-STARS (*Ophiuroidea*), one of the classes of *Echinodermata*, including forms not far removed from star-fishes, but differing markedly in the more centralized body, more sharply defined arms and more active habit. An illustration is given under the heading *Ophiuroidea*, in the article on ECHINODERATA, in Vol. VII, p. 634. The popular name *brittle-star* refers to the extreme ease with which the arms break. Another common name, "sand-stars," refers to their occasional occurrence on the shore; the technical title, *Ophiuriod*, describes the snake-like coils of their "arms."

BRITTON, capital of Marshall County, north-eastern South Dakota, 28 miles N. of Andover, on the Chicago, Milwaukee and St. Paul railroad. It has flour and feed mills, and had a population of 514 in 1890.

BRITTON, NATHANIEL LORD, an American botanist; born on Staten Island, New York, Jan. 15, 1859. He graduated from the school of mines, Columbia College, in 1879, where he later lectured on botany, being also botanist and geologist to the New Jersey state survey. He has published *Catalogue of the Flora of Richmond County, Staten Island* (1879); *The Geology of Staten Island* (1880); *Catalogue of the Flora of New Jersey* (1892).

BROACH. See BAROACH, in these Supplements.

BROAD ARROW, a mark, either stamped, cut, branded or otherwise affixed by the officers of the British government on all solid materials used in British ships or dockyards, and on government stores of all kinds, in order to prevent embezzlement. The origin of its use for this purpose is not clear. In the latter part of the seventeenth century a dealer in marine stores was prosecuted by the government for having in his possession certain stores bearing this mark. He was acquitted, but this incident led to the passage of an act in 1698 which enacts that persons found in possession of stores or goods of any kind bearing this mark shall forfeit all such goods, be fined £200 and pay the costs.

The name *Broad Arrow* is also the title by which a service gazette published in England is known. For the broad arrow in heraldry, see Vol. XI, p. 703.

BROADHURST, Henry, son of a journeyman stone-mason, was born at the village of Littlemore, near Oxford, in England, in 1840, and became secretary of the Labor Representation League in 1872. In 1875 he was appointed secretary of the Parliamentary committee of the Trades Union Congress, and took a leading part in the organization of public meetings during the agitation on the Eastern question, supporting Gladstone's policy. He was elected member of Parliament for Stoke-on-Trent in 1880, served on two labor commissions, and was elected in 1885 for the constituency of the Bordsley division of Birmingham. In 1886 he was appointed Under-Secretary of State for the Home Department by Mr. Gladstone. At the general election of 1886 he was elected for West Nottingham; failed of re-election in 1892; was elected in 1894 for Leicester, for which he was re-elected in 1895. He took a leading part in the passage of the Employers' Liability Act, and was the author of the Leasehold Enfranchisement Bill.

BROAD MOUNTAIN, in Carbon and Schuylkill counties, east-central Pennsylvania, noted as the anthrachite region of the state. The mountain has an elevation of 2,000 feet above sea-level. It is the northern boundary of the Pottsville coal basin, which it separates from the Mahanoy basin. It is about five miles wide, its western extension being called Locust Mountain.

BROADS, The Norfolk, a series of inland lakes of England, usually said to be formed by the widening or "broadening" out of the rivers. More probably their origin is due to a change in the general level of the land surface of that country even within historic times; for the river Yare was an estuary of the sea, in which herrings were caught, at the time of Domesday. The Broads *par excellence* are these up the Bure or North River, and its tributaries, the Ant and the Thurne. The first (Wroxham) is the largest and deepest, there being sailing-water for large boats all over it. Up the Ant there is a fine broad at Barton, and up the Thurne there is a very large one at Hickling and two others at Martham and Horsey. The Broads have grown greatly in favor with holiday-makers of late, and the influx of visitors has destroyed the extreme quiet which was the great charm of the place to naturalists and fishermen. To the antiquary the district is full of interest, the ruins of St. Benet's Abbey, of Burgh Castle (Roman), and many interesting churches, being within easy reach.

BROAD TOP MOUNTAIN, in the northeast of Bedford County and south of Huntingdon, central southern Pennsylvania, rising about 2,500 feet above sea-level. It has extensive beds of bituminous coal, for the transportation of which the Huntingdon and Broad Top Mountain railroad was built.

BROADUS, John Albert, an American clergyman and author; born in Culpeper County, Virginia, Jan. 24, 1827. He completed his education at the University of Virginia, and for two years taught there as assistant professor of ancient languages. He belonged to the Baptist denomination, and his first pastoral work was in Charlottesville. In 1859 the Southern Baptist Theological Seminary, Greenville, South Carolina, now in Louisville, Kentucky, called him to the chair of New Testament interpretation and homiletics. He has published *The Preparation and Delivery of Sermons* (1870); a series of papers on *Recollections of Travel* (1886–88); *Lectures on the History of Preaching* (1876); *Three Questions as to the Bible* (1884); *Commentary on Matthew* (1886); *Sermons and Addresses* (1886); *Jesus of Nazareth* (1890). The first book mentioned in the list has been largely adopted as a textbook in theological schools. Dr. Broadus is considered the finest Greek scholar and New Testament critic in his denomination in the South.

BROCA, Paul, a French surgeon and anthropologist, born at Sainte-Foy-la-Grande, Gironde, in 1824; died July 9, 1880. After pursuing his medical studies with distinction, he was chosen professor of surgical pathology in the Faculty of Medicine in Paris, and surgeon successively of the four hospitals of Bicêtre, La Salpêtrière, Saint-Antoine and La Pitié. Celebrated as a surgeon, Broca was also regarded as one of the most learned masters of the existing school of anthropology. He founded the Paris Anthropological Society, of which he was secretary till his death, and he was a member of all the leading medical, biological and anatomical societies of Paris and the Continent. In 1861 he enunciated the theory that in aphasia the part of the brain necessarily diseased is the posterior third of the inferior left frontal convolution, which has since received the name of *Broca's convolution*. Elected a member of the Academy of Medicine in 1866, he was decorated with the Legion of Honor in 1868. Broca was a voluminous writer, and among his more important works may be mentioned the following: *Des Anévrismes et de Leur Traitement* (1856); *Sur l'Anésthésie Chirurgicale Hypnotique* (1859); *Études sur les Animaux Ressuscitants* (1860); *Instructions Générales pour les Recherches Anthropologiques* (1865); *Traité des Tumeurs* (1865); *Caractère Physique de l'Homme Préhistorique* (1869). He also collaborated in the production of several important medical and physiological works. In 1878 he presided over an international congress on anthropology held in Paris.

BROCADE (Spanish, *brocado*). This term is applied to a silk material variegated with gold or silver, or ornamented with raised flowers, foliage and various sorts of figures; the name is also applied to other stuffs wrought in the same manner. Oriental brocades date from a remote period, but there were probably no European stuffs of this nature earlier than the thirteenth or fourteenth century, when they were made in Italy and Spain. In common with damasks, figured tissues and other varieties of ornamented silks made in past times, Italian and Spanish brocades, dating from the fourteenth to the seventeenth century, as well as those of Persia and Asia Minor, extending over a longer period of time, are extremely valuable objects of study for the textile designer and decorative artist. Fine examples of

these are to be found in some Continental museums.

BROCCOLI, a well-known and much-esteemed garden vegetable, one of the many varieties which cultivation has produced of the *Brassica oleracea*, the common kale or cabbage. See HORTICULTURE, Vol. XII, p. 279.

BROCHS, the local name applied in the north of Scotland to the ancient, dry-built, circular castles; known also to the Gaelic-speaking people as *duns*. See ORKNEY AND SHETLAND, Vol. XVII, p. 848; also ROUND TOWERS, Vol. XXI, p. 22.

BROCK, SIR ISAAC, an English soldier; born on the island of Guernsey, Oct. 6, 1769; killed in battle at Queenston, Canada, Oct. 13, 1812. As a member of the British army he served in Jamaica, Barbadoes, the North Holland expedition and along the Baltic. In 1810 he was sent to Upper Canada, having been appointed lieutenant-general. He prepared for war with the United States, advanced to Detroit and compelled the surrender of the place. From here he went to the Niagara frontier, where a battle was fought with the Americans, in which Brock was killed.

BROCK, THOMAS, an English sculptor, was born at Worcester in 1847. In London he became a student at the Royal Academy, where, in 1869, he was awarded the gold medal for historical composition. Under the tuition of Foley, he progressed speedily as a sculptor. His *Hercules Strangling Antæus* brought him much notoriety, while an equestrian group, entitled *A Moment of Peril*, was purchased for the nation. He has produced many lifelike statues, and was elected A.R.A. in 1883, and R.A. in January, 1891.

BROCKEN OR BLOCKSBERG, a remarkable mountain in Germany. See HARZ MOUNTAINS, Vol. XI, p. 507.

BROCKES, BARTHOLD HEINRICH, an optimistic German poet; born in Hamburg in 1680; died there in 1747. He was the first of the nature poets and also the first German poet to understand and appreciate English literature, and was known as the translator of Pope. See also GERMANY, Vol. X, p. 532.

BROCKETT, LINUS PIERPONT, an American author; born at Canton, Connecticut, Oct. 16, 1820; studied at Brown University and graduated in medicine at Yale in 1843. After practicing medicine he engaged in the publishing business in Hartford, and from 1857 devoted his whole time to writing. Among his works are *History and Progress of Education* (1859); *The Philanthropic Results of the Civil War* (1864); *The Life and Times of Abraham Lincoln* (1865); *Asiatic Cholera* (1866); *Our Great Captains* (1866); *Grant and Colfax* (1868); *Men of Our Day* (1868); *The Year of Battles, or the Franco-Prussian War* (1871); *Walter Powell, the Thorough Business Man* (1872); *The Silk Industry of America* (1876); *Our Western Empire* (1881). He died in Brooklyn, Jan. 13, 1893.

BROCKHAUS, HEINRICH AND HERMAN, sons of Friedrich Arnold Brockhaus (q.v., Vol. IV, p. 357). HEINRICH was born at Amsterdam, Feb. 4, 1804, succeeded his father in the publishing business and died in Leipsic, Nov. 15, 1874. HERMAN was born at Amsterdam, Jan. 26, 1806, was educated at the universities of Leipsic, Göttingen and Bonn; became a professor at Jena, and subsequently of Sanskrit speech and language in Leipsic, in which town he died, in 1877. He edited several editions of the Sanskrit and Persian text, and was one of the later editors of the *Allgemeine Encyclopädie*. (See ENCYCLOPÆDIA, Vol. VIII, pp. 203,204).—HEINRICH EDUARD and HEINRICH RUDOLF, sons of HEINRICH, above. EDUARD was born at Leipsic, Aug. 7, 1829, and was educated at Leipsic, Heidelberg and Berlin; and was a member of the Reichstag, 1871 to 1878. In 1874 he succeeded his father as head of the publishing house that bore the family name. RUDOLF was born at Leipsic, July 16, 1838, and became his brother's partner.

BROCKPORT, a village, Monroe County, northwestern New York, situated in a fertile and wealthy agricultural district, on the New York Central and Hudson River railroad, about 17 miles W. of Rochester. Farming implements and other machinery are extensively made here, and it is the seat of a state normal school. Population 1890, 3,742.

BROCKTON (formerly North Bridgewater), a manufacturing town of Plymouth County, eastern Massachusetts, about 20 miles S. of Boston. It contains extensive establishments for the manufacture of boots and shoes, being almost unrivaled in this industry. There are also large factories for wooden and paper boxes, shoe-tools, etc. Population 1890, 27,294; 1895, 33,157.

BROCKVILLE, capital of Leeds or Brockville County, Ontario, on the north bank of the St. Lawrence, about 40 miles below Kingston, and on the Grand Trunk railroad. It is a terminal point of the Canadian Pacific railroad, and the terminus in the south and east and of the Brockville, Westport and Sault Ste. Marie railroad. It is a port of entry and call for steamers plying on the St. Lawrence. It is situated at the foot of the celebrated Lake of the Thousand Isles. The town has extensive manufactures of hardware, stoves, farming implements, engines, boilers and gloves, and has tanneries, flouring and saw mills and a manufactory of sulphuric acid and superphosphate of lime. It has a ferry connection with Morristown, New York. Four miles further down the river is Prescott, opposite which, on the south shore of the St. Lawrence, is Ogdensburg, N. Y. The population of Brockville in 1881 was 7,609; in 1891, 8,793. Its estimated population in 1895 was 9,134, with an assessment valuation of $3,527,788.

BROCRAM (signifying "broken rock") is the local name given to the breccias of Lower Permian age which occur in the north of England, or near Appleby and Kirby Stephen. See BRECCIA, in these Supplements.

BRODERICK, DAVID C., born in Washington, District of Columbia, 1820; killed in California, Sept. 16, 1859. He went to the Pacific Slope in 1849, became state senator next year, and in 1856 was elected United States Senator. He got into a difficulty with David S. Terry, then chief justice of the state supreme court, who challenged him, and Broderick fell at the first fire. Terry, in 1889, was shot dead by a United States marshal named Neagle.

BRODHEAD, a town of Green County, southern Wisconsin, situated on Sugar River, about 35 miles S. of Madison, on the Chicago, Milwaukee and St. Paul railroad. It is the seat of a high school, and manufactories of flour, machinery, carriages, wagons, corn-planters and plows. Population 1890, 1,461.

BRODHEAD, JOHN ROMEYN, an American historian; was born at Philadelphia, Jan. 2, 1814; graduated at Rutgers College in 1831, and admitted to the bar in New York City in 1835. In 1839 he was attached to the United States legation at The Hague, and having devoted himself to the study of American history he was appointed to make researches for documents illustrating the early history of the state of New York, in which he was most successful. The documents he collected were afterwards published in 11 quarto volumes. In 1846 he was appointed secretary of legation in London, under United States minister Bancroft, which position he held until 1839. In 1853 he became naval officer of the port of New York. His great work, the *History of the State of New York*, engaged his assiduous attention for years; the first volume did not appear until 1853, and the second not till 1871. He died in New York City, May 6, 1873.

BRODRICK, GEORGE CHARLES, warden of Merton College, Oxford, was born at Castle Rising, Norfolk, England, May 5, 1831; his father being the late Viscount Midleton. He went to Balliol College from Eton, and graduated at the former in 1854, and was elected a fellow of Merton College the following year. He obtained many high scholastic honors, and in 1858 carried off the law scholarship at the University of London, where he received the degree of LL.B. In 1885 he was made D.C.L. of Oxford. He has published *Political Studies* (1880); *English Land and English Landlords* (1881); *The Reform of the English Land System* (1883); *Memorials of Merton College* (1885); *History of the University of Oxford* (1886); besides many important articles in the *Nineteenth Century* and *Fraser's Magazine*.

BROGLIE, AUGUSTE THEODORE PAUL, a French abbé, brother of the following; born at Paris, June 18, 1834; served in the navy; having reached the rank of lieutenant in 1862, he retired from the service to devote himself to an ecclesiastical career. He became chaplain of the normal school in the municipality of Auteuil, and upon the abolition of this office he was appointed professor of apologetics in the Catholic Institute in Paris. He was made honorary canon of Evreux and Paris, and was decorated with the Legion of Honor. He wrote *Lectures upon the Supernatural Life* (1878); *Positivism and Experimental Science* (1881); *Science and Religion* (1883); *Problems and Results of the History of Religion* (1885); *Morality without God* (1886).

BROGLIE, CHARLES JACQUES VICTOR ALBERT, DUC DE, son of Achille (see BROGLIE, Vol. IV, p. 359); born in Paris, June 13, 1821; elected Academician in 1862, and was elected to the Assembly the same year. Under the republic he was, in 1872, minister to England for a short time, returned to lead the opposition to the Thiers government, and became Minister of Foreign Affairs under MacMahon (1873–74). He was elected Senator in 1876; became President of the Council and Minister of Justice in the Conservative cabinet in 1877, and did all in his power to secure the return of Orleanist deputies at the election of that year. An overwhelming Republican majority in the Chamber drove him from power. His most important literary work is *The Church and the Roman Empire in the Fourth Century*, a history of the reign of Constantine from the Catholic standpoint (2 vols., 1856). He has also written two works on Frederick the Great from family papers, and numerous works on religio-historical subjects.

BROGUE, a light shoe made of rawhide, with the hair outward, gathered around the ankle, which was formerly in use among the ruder native Irish and the Scottish Highlanders. The term *brogue*, now applied to any dialectic pronunciation of speech, is thought to have its origin from the rude Irish shoe.

BROKEN BOW, capital of Custer County, central Nebraska, on the Burlington and Missouri River railroad, 80 miles from Grand Island. It is in the center of a rich agricultural region and is growing in importance, its population in 1890 being 1,645.

BROKER. A broker is one who is engaged in the business of negotiating contracts for others, relative to trade or commerce. The distinction between brokers and other classes of agents is, that brokers do not have the custody of the property concerning which the negotiations are made. A broker is the agent of the party for whom he undertakes the negotiation until a bargain is made, when he becomes agent for both parties for the purpose of executing the contract. One transaction, as the selling of one piece of real estate, will not make the agent a broker within the meaning of the laws and ordinances which require certain classes of brokers to pay a broker's license. In most cities ordinances are in force requiring real estate and many other classes of brokers to procure a license and pay a fee to the city for the privilege of carrying on the business of a broker, and when such ordinances exist, a broker who has not complied with it cannot recover any commission or remuneration whatever for his services. A broker may bind his principal by contract within the scope of his authority, and is otherwise governed chiefly by the laws applicable to agency. A broker's compensation is generally a commission, termed brokerage, and is contingent upon his success. The commission is earned when the negotiation is completed and the part undertaken by the broker done according to agreement. If the transaction afterwards fails, through no fault of the broker, or through the fault of the principal, as by failure to give good title, the commission must nevertheless be paid. Several brokers may be employed to effect the same object, and the one who is successful is entitled to his commission without sharing in any way with the others. A broker cannot, except by special agreement with knowledge of the facts, receive compensation from both parties to the transaction. If the broker was the procuring cause of the successful transaction, it

entitles him to compensation, and if such is the case, he may recover his commission, even if the principal actually negotiated the transaction. See BROKER, Vol. IV, p. 360.

BROMAL, a drug similar to chloral. See ALCOHOL, Vol. I, p. 470.

BROME-GRASS, a popular name for grasses of the genus *Bromus*. The species are widely distributed in the north temperate regions of both hemispheres, and are generally such coarse grasses as to be of little value as forage, although *B. unioloides* has some reputation as a fodder. *B. secalinus* is the well-known "chess" or "cheat," so troublesome a weed in wheat-fields, and having given rise to a very current superstition that "wheat turns into cheat." Several species are natives of the United States, and others have been introduced.

BROMELIACEÆ, a family of monocotyledonous plants, allied to *Amaryllidaceæ*, but usually distinguished by their perianth-whorls, differentiated as calyx and corolla, and by their very characteristic habit. The stem is usually short and thick and crowned with a rosette of numerous leaves, which are thick and rigid and often with spiny edges. These leaves are usually channeled, and completely envelop each other at bases, forming a very favorable device for the collection and retention of water. The species are also largely epiphytic, supported usually upon trees or rocks, but depending entirely upon the atmosphere for their food-supply. The species are very numerous and are all natives of tropical and subtropical America. Some of the best-known forms are *Ananas sativa*, the pineapple; *Tillanandsia usneoides*, the long-moss, or black moss, or Spanish moss of the south, whose gray hair-like stems hang in festoons from forest trees; species of *Bilbergia*, known as "traveler's tree," from the somewhat abundant water-supply often found in their sheathing leaf-bases. Many of the species also yield a usable fiber, obtained from their leaves.

BROMIC ACID, the best-known compound of bromine and oxygen. It forms a whole series of salts called bromates, none of which are of importance. See CHEMISTRY, Vol. V, pp. 496, 498.

BROMIDE OF ETHYL, an anæsthetic claimed to be superior to ether or chloroform. It is used by members of the medical profession, for the reason that it does not influence the circulation, except sometimes to produce a slight increase in the rapidity of the heart's action and in arterial pressure. Respiration is but little affected by it, and there is but little, if any, nausea or vomiting. It vaporizes readily, and produces no irritation in the respiratory passages, and there is far less tendency on the part of the patient to struggle, as is frequently the case when ether or chloroform is administered. Complete anæsthesia is accomplished in about one third the time experienced in the use of ether and chloroform, and the recovery is much more rapid, two minutes being enough for its completion. The vapor is not inflammable, hence no danger attends its use in the presence of artificial lights.

BROMINE, a chemical element. (See Vol. IV, p. 361.) Bromine is now being extensively used as a substitute for iodine alcoholic compounds in the manufacture of coal-tar dyes, and also to some extent in the production of various artificial dyestuffs. On account of its volatile nature, it is now generally shipped in a solid or liquid form, as bromide of iron or of ethyl.

BRÖMSEBRO, a village and castle of Sweden, 27 miles S. of Kalmar. Treaties were signed here between Sweden and Denmark in 1541, 1641 and 1645, by which the latter renounced Jemtland, the island of Gothland, etc.

BRONCHI OR BRONCHIAL TUBES. See RESPIRATION, Vol. XX, p. 475.

BRONCHOCELE. See GOITRE, Vol. X, p. 739.

BRONI, a town of northern Italy, with mineral springs, 11 miles S.E. of Pavia. Near by is the castle of Broni, where Prince Eugene obtained a victory over the French in 1703. Population, 5,147.

BRONN, HEINRICH GEORG, a German naturalist; born at Ziegelhausen in 1800; died July 5, 1862. He was educated at Heidelberg, where, in 1828, he commenced a course of lectures on natural history and palæontology. In 1833 he was nominated professor of physics, and was afterwards appointed to the zoölogical lectureship. His most important geological work is *Lethæ Geognostica* (1834); other works are *Geschichte der Natur* (1841–49) and *Allgemeine Zoölogie* (1850). The last-mentioned work was the first attempt to develop zoölogy in its entirety with reference to extinct organisms.

BRONTOMETER, an apparatus for noting the phenomena of a thunder-storm. The form made by MM. Richard *frères* has an endless sheet of paper, fed continuously, by a train of clockwork, under seven recording pens. The first pen serves as a base-line, on which the time may be noted; the second pen gives the record of a special form of anemometer; the third pen permits the observer to make note of the intensity of the rainfall; the fourth pen is for the record of lightning-flashes as seen by the observer; the fifth pen notes the duration of thunder in the same manner; the sixth pen notes the hail observed; the seventh pen operates automatically, and records the atmospheric pressure.

BRONTOTHERIDÆ, a genus of huge extinct (fossil) ungulates discovered aud named by Prof. O. C. Marsh of Yale, in the Miocene east of the Rocky Mountains. The genus includes two species, the *Brontotherium* and the *Titanotherium*. The animals belonging to these species were rhinoceros-like creatures of elephantine size, with a transverse pair of large bony protuberances, probably horn-cores, rising from the nasal region.

BRONZE, AGE OF. See ARCHÆOLOGY, Vol. II, p. 339.

BRONZED SKIN. See *Addison's Disease*, in PATHOLOGY, Vol. XVIII, p. 384.

BRONZEWING AND BRONZE PIGEON, names given to certain Australian birds, mostly of the genus *Phaps*. The wings are marked by large bronze spots. The birds are used as food.

BRONZITE, silicate of magnesia and ferrous oxide, a rock-forming mineral belonging to the pyroxene group. It sometimes has a bronze-like luster, due to microscopic inclusions. (See MINERALOGY, Vol. XVI, p. 415). Spherules of bronzite

have been recovered from the deep-sea deposits of the Atlantic and Pacific, a description of which may be found under PACIFIC OCEAN, Vol. XVIII, p. 126.

BROOKE, STOPFORD AUGUSTUS, born in Letterkenny, Donegal, Ireland, Nov. 14, 1832, After a brilliant course at Trinity College, Dublin, he took orders, and after holding various curacies was incumbent of St. James's Chapel from 1866 to 1875, and subsequently of Bedford Chapel, Bloomsbury, where his ability soon secured him a prominent place among the preachers of London. In 1872 he was appointed chaplain-in-ordinary to the Queen. In 1880, from conscientious motives, he seceded from the Church of England, and joined the Unitarian denomination, but continued to preach in his proprietary chapel in Bloomsbury. His works comprise *Life of Frederick Robertson of Brighton* (1865); *Theology in the English Poets* (1874); *Primer of English Literature*, an invaluable educational handbook (1876); *Tennyson: His Art in Relation to Modern Life* (1894); and six volumes of *Sermons* (1868–88).

BROOK FARM ASSOCIATION FOR EDUCATION AND AGRICULTURE, THE. See RIPLEY, GEORGE, Vol. XX, p. 567.

BROOKFIELD, a town in Linn County, northwestern Missouri. It is situated on Yellow Creek, and on the Hannibal and St. Joseph railroad, about 25 miles E. of Chillicothe. It contains the extensive machine-shops and roundhouse of the Hannibal and St. Joseph railroad; coal is found in the vicinity. Population 1890, 4,547.

BROOKHAVEN, capital of Lincoln County, southwestern Mississippi. It is on the Illinois Central railroad, 50 miles S. of Jackson. It is the seat of Whitworth Girls' College, and the center of a lumber and cotton trade. Population 1890, 2,142.

BROOKINGS, capital of Brookings County, eastern South Dakota, situated in a fertile agricultural district, on the Chicago and Northwestern railroad, 65 miles W. of Tracy, Minnesota. It has large milling interests, and is the seat of the State Agricultural College, and the location of a United States agricultural experiment station. Population 1890, 1,518.

BROOKITE, a mineral found in Scotland, Savoy and a few other places; named after its discoverer, H. J. Brooke, a British mineralogist. See MINERALOGY, Vol. XVI, p. 387.

BROOKLIME, species of *Veronica*, a genus of *Scrophulariaceæ*, growing in ditches, watercourses and wet places near springs. The name was originally applied to the European *V. Beccabunga*, but has come into use for all the "water speedwells," such as *V. Anagallis*, *V. Americana*, etc. The flowers are small and blue.

BROOKLINE, a town of Norfolk County, central eastern Massachusetts, on the Boston and Albany railroad, four miles S. of Boston, from which and Cambridge it is separated by the Charles River. It is a residential suburb of Boston, with which it is connected by railroad and street-cars. It is beautifully laid out and shaded, and has many fine residence and public buildings. Scientific apparatus and instruments are manufactured here. Population 1890, 12,103; 1895, 16,159.

BROOKLYN, a town of Poweshiek County, southeast central Iowa, about 100 miles W. of Davenport. It has grain-elevators, a steam flouring-mill and a roundhouse. Population 1890, 1,244.

BROOKLYN, capital of Wyndham County, northeastern Connecticut, two miles E. of the Quinebaug River, and 42 miles E. of Hartford. It has a creamery, and manufactures cotton goods and spectacles. Population 1890, 2,628.

BROOKLYN, the second city of the state of New York. For its early history and local map, see BROOKLYN, Vol. IV, pp. 370, 371. Its population was 206,661 in 1860, 396,099 in 1870, 566,689 in 1880, and 806,343 in 1890. Its magnificent Prospect Park has been greatly improved, and the two boulevards connected with it have been extended, one to Coney Island and the other to East New York. The city now covers an area of nearly 25 square miles, and its boundary line reaches an extent of about 22 miles, with a water frontage of 8½ miles. The Long Island railway system connects the city with every part of Long Island, and two extensive elevated railway systems (the first opened in 1885) furnish rapid transit from the suspension bridge and the principal ferries to the more distant portions of the city. The Atlantic dock embraces within its piers an area of about 41 acres, Brooklyn basin 40 acres, and the Erie basin 60 acres. They are the most extensive works of the kind in the United States, and are lined with immense storehouses for grain and other freight, forming probably the largest grain depot in the world. The United States navy-yard occupies about 40 acres, and contains extensive workshops and an immense dry-dock costing about $1,000,000. The principal public buildings are the courthouse, city hall, post-office (completed in 1891), Academy of Music, with seating capacity of 2,400, Academy of Design, municipal building, hospitals, house of correction, almshouse, lunatic asylum, and deaf mutes' asylum. Charitable institutions are numerous. The Seney Methodist Hospital, completed in 1888, is one of the largest and most thoroughly equipped hospitals in America. The churches number about 375, with a total of nearly 350,000 communicants. The industrial establishments number over 10,000, with an aggregate capital of over $125,000,000, and employing over 100,000 operatives. There are 11 distinct libraries. The Brooklyn Library contains 105,000 volumes; the Long Island Historical Library, 45,000 volumes. The Brooklyn Institute and Youths' Free Library, 16,000; Law Library, 11,000; Long Island Free Library, 5,000; Pratt Institute Library, 20,000; and the Young Men's Christian Association Library, 10,000. Educational institutions abound, many being of a high order. There are 78 public schools, and in 1890 there were registered 86,000 pupils. The value of school property is about $6,000,000. Among the higher institutions of learning are the Brooklyn Institute, embracing 14 departments; Adelphi Academy; Polytechnic Institute; Pratt Institute; St. Francis College, and St. John's College. On May 11, 1896, in spite of

opposition by the mayors of Brooklyn and New York City, the legislative bill became law which made Brooklyn a part of Greater New York.

BROOKS, CAROLINE SHAWK, an American sculptress; born in Cincinnati, Ohio, April 28, 1840. She first attracted notice by modeling in butter a head of *Dreaming Iolanthe*, and exhibiting it at the Centennial Exhibition in 1876. A larger one was exhibited at the Paris Exposition in 1878. She subsequently made marble busts of Garfield, George Eliot, Thomas Carlyle, Emanuel Swedenborg and others.

BROOKS, CHARLES TIMOTHY, an American author; born in Salem, Massachusetts, June 20, 1813; died in Newport, Rhode Island, June 14, 1883. He graduated from Harvard in 1832, and after pursuing a course of study in theology began to preach in 1835. Two years later he became pastor of a Unitarian church in Newport, Rhode Island. He published poems, sermons, a *Life of William Ellery Channing* (1880), and a book concerning his travels in India. He is best known as a German translator. Some of his translations are Schiller's *William Tell; Homage of the Arts;* Goethe's *Faust;* Richter's *Titan* and *Hesperus*.

BROOKS, ERASTUS, an American statesman; brother of James Brooks; born in Portland, Maine, Jan. 31, 1815. He was a printer and journalist, being successively connected with the *Maine Yankee*, the Haverhill *Gazette*, and the New York *Express*. During 16 successive sessions of Congress he was Washington correspondent of the latter. In 1843 he went abroad as foreign correspondent. He was one of the leaders of the American or "Know-nothing" party, and its candidate for governor of New York in 1856. Defeated, he joined the Democrats. He was several times elected to the New York legislature. In 1853–57, while state senator, his support of the bill to divest Catholic bishops of the title to church property involved him in his noted controversy with Bishop Hughes, which was published in two volumes (1855). He died Nov. 25, 1886.

BROOKS, JAMES, an American journalist; born in Portland, Maine, Nov. 10, 1810; died in Washington, District of Columbia, April 30, 1873. He found much difficulty in obtaining an education, on account of his father's death and the poverty of the family. His employer aiding him, he graduated at Waterville in 1831, and began the study of law. He was already a newspaper correspondent, and in 1832 he went to Washington, and from there contributed articles to the Portland *Advertiser*. These were the first "Washington letters," and they set the fashion. He traveled through the South and Europe, sending to the newspaper accounts of his trips. In 1836 he started the New York *Express*. He was a member of the Maine legislature (1835), the New York legislature (1847), and of Congress (1849). He was a member of the American party up to 1861, when he became a Democrat. From 1865 to 1873 he was in Congress. In the last-mentioned year he was censured by Congress for having stock in the Crédit Mobilier. The mortification caused by this rebuke is thought to have hastened his death. He was, in 1869, one of the government directors of the Union Pacific railroad. In 1871 and 1872 Mr. Brooks made a voyage around the world, and wrote a description of his travels.

BROOKS, MARIA GOWEN, an American poetess; born in Bedford, Massachusetts, about 1795; died in Matanzas, Cuba, Nov. 11, 1845. Her father was a man of literary tastes, which she inherited. At the age of 19 she wrote lyrics and a metrical romance. She published *Judith, Esther, and Other Poems, by a Lover of the Fine Arts; Zophiël; Idomen, or the Vale of Yumuri;* and an *Ode to the Departed*.

BROOKS, NOAH, an American author; born in Castine, Maine, Oct. 30, 1830. He has been connected with the *Alta Californian*, New York *Times* and *Tribune*, but is best known as a magazine-writer, the author of books for boys, and a *Life of Abraham Lincoln* (1888).

BROOKS, PHILLIPS, clergyman; born in Boston, Massachusetts, Dec. 13, 1835. He graduated at Harvard in 1855, and received his theological training at the Alexandria (Virginia) Seminary. Ordained in 1859, he was made rector of the Church of the Advent at Philadelphia, and was called to Holy Trinity, in the same city, three years later. After seven years' ministration there, he accepted the rectorship of Trinity Church, Boston. Phillips Brooks's reputation as a sermonizer was very great. He was rapid in utterance, full of spiritual thought, and of noble and majestic stature. In 1886 he declined the election to be assistant bishop of Pennsylvania. He became noted for his broad church views. He exerted a marked influence over young men, and was a stated preacher at Harvard University. In 1891 he was elected bishop of Massachusetts. He died Jan. 23, 1893. His *Lectures on Preaching* were delivered on the Lyman Beecher foundation at Yale University. He also published five volumes of sermons, held in high estimation. A statue of him stands in Copley Square, near the scene of his pulpit labors. He was a great traveler, and received distinguished academic and social recognition in England.



PHILLIPS BROOKS.

BROOKS, PRESTON SMITH, an American Congressman; born in Edgefield District, South Carolina, Aug. 4, 1819; died in Washington, District of Columbia, Jan. 27, 1857. He graduated at the State University, was admitted to practice law, elected to the legislature in 1844, and served in the Mexican War. He was three times sent to Congress as a State Rights Democrat. He is remembered chiefly from his brutal attack on Senator Sumner, May 22, 1856 (see SUMNER, Vol. XXII, p. 643), on the floor of the Senate, after the adjournment of the members. He repeatedly struck Sumner on the head with a cane till the latter fell insensible to the floor. The vote was taken afterwards to expel him from the House, but his friends were in the majority, and the motion did not pass. He was afterwards implicated

in a quarrel with Anson Burlingame, and a duel was arranged to be fought in Canada, but Brooks failed to appear, alleging that in order to reach Canada he would have "to pass through the enemy's country."

BROOKS, WILLIAM KEITH, an American biologist; born in Cleveland, Ohio, March 25, 1848. He was graduated at Williams College in 1870, and at Harvard in 1878, where he received the degree of Ph.D. In 1876 he became a fellow of Johns Hopkins University, associate in the same year, and professor of morphology in 1883. In 1878 he organized the Chesapeake Summer Laboratory for the study of marine life, which has become famous among the world's institutions of the kind. In 1884 he was elected a member of the National Academy of Sciences, is chairman of the Maryland Oyster Commission, and is a member of many other American and foreign scientific bodies. He has published *Studies from the Biological Laboratory* (1879 and 1893); *Handbook of Invertebrate Zoölogy* (1881); *The Law of Heredity* (1883); *The Development and Protection of the Oyster in Maryland* (1884); *Conifer: A Study in Morphology*, published in *The Transactions of the Royal Society*, London (1881); *Report on the Stomatopoda Collected by H.M.S. Challenger*, also published in the same transactions (1868).

BROOKSVILLE, capital of Hernando County, western Florida, on the Florida Southern railroad, 50 miles N. of Tampa, and about 25 miles from the Gulf of Mexico. Cotton, sugar and cereals are cultivated in the district, and there are also orange-groves and truck-farms. Population 1890, 512.

BROOKSVILLE, capital of Bracken County, northeast Kentucky, about eight miles S. of the Ohio River. Population 1890, 330.

BROOKVILLE, capital of Franklin County, eastern Indiana, situated on the Whitewater River, about 40 miles N.W. of Cincinnati. The river furnishes an immense water-power for the manufacture of paper, flour and machinery. Brookville is the seat of Brookville College. Population 1890, 2,028.

BROOKVILLE, capital of Jefferson County, west-central Pennsylvania, 42 miles S. of Oil City, on the Alleghany railroad and on the Red Bank Creek. It has saw, shingle, planing and flouring mills, also iron foundries. Coal and iron abound in the vicinity. Population 1890, 2,478.

BROOM, a popular name given to a number of species of leguminous shrubs, characterized by long, slender branches and yellow flowers. The common broom (*Cytisus*, or *Sarothamnus scoparius*)—(see BOTANY, Vol. IV, pl. 5)—is a well-known native of Britain, the continent of Europe and northern Asia, growing in dry soils and ornamenting hedge-banks, hills and bushy places, in May and June, with its large yellow flowers. It is famous as the *Planta genista* (French, *plante genêt*), which was the badge of the Plantagenets. In South Germany it is sometimes planted for its fibers; the flowers were formerly employed in medicine, and as a yellow dye. Spanish broom (*Spartium junceum*), a closely allied species, is a native of the south of Europe. It is the *Spartium* of the ancients, and the fiber of the branchlets has been used from time immemorial in some parts of Italy, France and Spain for the making of canvas, nets, ropes, etc. Dyer's broom (*Genista tinctoria*) is, with other members of the same genus, a well-known source of yellow coloring matter.

BROOM-CORN, a variety of *Sorghum vulgare*, a reed-like grass, growing to a height of 8 or 10 and sometimes 15 feet. It is nearly allied to the durra (q.v.) and the millet (q.v). Its introduction into the United States is ascribed to Benjamin Franklin. It is a native of India, but largely cultivated in North America for the manufacture of brooms and whisks, which are made of the tops of the culms and the branches of the panicle. Before harvesting, the stalks are broken or bent some three feet above the ground, so that the top or panicle may hang in a drooping position. This process is called "tabling," and is done to secure straight brush. The seed is sometimes used for feeding poultry and the leaves for cattle-feed.

BROOME, SIR FREDERICK NAPIER, an English public official; born in Canada in 1842; was educated in England and emigrated to New Zealand in 1857. In 1864 he returned to England and married Lady Barker. (See LADY BROOME, below.) He became an attaché on the staff of *The Times*, representing that journal at the marriage of the Duke of Edinburgh to the daughter of the Czar of Russia in 1874. The following year he was appointed secretary to the government of Natal, and in 1877 to the government of the Mauritius, becoming lieutenant-governor of the latter in 1880. In 1882 he was appointed governor of Western Australia, from which he was sent to be governor at Trinidad. He was made a K.C.M.G. in 1877. He has published two volumes of poetry: *Poems from New Zealand* (1868) and *The Stranger of Seriphos* (1869).

BROOME, MARY ANN, formerly LADY BARKER, authoress, the eldest daughter of the late W. G. Stewart, secretary of Jamaica, where she was born. She was sent to England when she was two years old and returned to Jamaica in 1850. Two years later she married Captain (afterward Colonel Sir) G. R. Barker. After the death of Sir George in 1860, she, in 1865, married Mr. (afterward Sir) Frederick Napier Broome (q.v., above), who was then in New Zealand. Lady Broome wrote and published *Station Life in New Zealand* (1869); which was so well received that she was encouraged to other efforts, among them being *A Christmas Cake in Four Parts* (1871); *Traveling About New and Old Ground* (1871); *Ribbon Stories* (1872); *Station Amusements in New Zealand* (1873); *Sybil's Book* (1873); *This Troublesome World* (1874); *The White Rat* (1880); besides other works on housekeeping, cooking and home life. Her books were all published in London, where she accepted the post of lady superintendent of the National Training School of Cookery. She was very popular in New Zealand, South Africa, Mauritius, Western Australia and Trinidad, where she successively resided with her husband.

BRORA BEDS, a series of strata occurring at Brora, a village in Sutherlandshire. See COAL, Vol. VI, pp. 53, 55.

BROSE, a Scotch dish, prepared by pouring boiling water, milk or the liquor in which meat has been boiled on oatmeal and mixing the ingredients by immediate stirring. When the brose is made with water, butter is usually added. The dish is denominated, according to the liquid used, *kail-brose*, *water-brose* or *beef-brose*. *Athole-brose* a famous Highland cordial, is a compound of honey and whisky, so called from Athole, a district of Perthshire, Scotland.

BROT, CHARLES ALPHONSE, a French novelist; born at Paris, April 12, 1809. After being for a time engaged in a law office and then in a bank, he adopted the profession of literature and became chief of the bureau of printing in the Department of the Interior. In 1830 he made his first literary attempt before the public, with *Chants d'Amour*, which he followed in 1833 with *Priez pour Elle!* (1833); *Ainsi Soit-il!* (1833); *Jane Grey* (1835; 3d ed., 1838); *La Comtesse aux Trois Galants* (1839); *Les Secrets de Famille* (1841); *La Sirène de Paris* (1845); *Le Réveil-Matin* (1847); *La Terre Promise* (1848); *Deux Coups de Tonnerre* (1853); *Les Deux Péchés* (1857); *La Cousine du Roi* (1855); *Miss Million* (1880); *La Déesse Raison* (1881); *Les Compagnons de l'Arche* (1881); the two latter with M. Saint-Véran. Besides the above, M. Brot has produced several dramas in collaboration with others.

BROTHER JONATHAN. See TRUMBULL, JONATHAN, Vol. XXIII, p. 592.

BROTHERHOODS, RELIGIOUS, numerous societies instituted in the middle ages for pious and benevolent purposes. Where the rules of monastic life appeared too narrow and severe, the Roman Church favored a freer form of consecrated life, without vows other than that of devotion to good works or penitential exercises; but in many other respects, as in living together and the like, the brotherhoods resembled the spiritual orders. Several of the confraternities, that either did not seek or did not obtain the recognition of the Church, assumed the character of sect, and being suspected of heresy, were severely persecuted. Even within the Protestant churches single brotherhoods have been formed, as the Ranhes Hans, founded by Wichern at Hamburg in 1833. Those formed by Father Ignatius and the Cowley Fathers at Oxford are Anglican brotherhoods. See also MONACHISM, Vol. XVI, p. 712.

BROTHERS, a name given to a group of six or eight rocky islets immediately outside the strait of Beb-el-Mandeb, varying in height from 250 to 350 feet. Brothers is also the name given to three isolated mountains near the coast of New South Wales, between Harrington Inlet to the south and Port Macquarie to the north. They are valuable as landmarks.

BROTHERS, LAY, an inferior class of monks, not in holy orders, but bound by monastic rules, and employed as servants in monasteries.

BROTHERS OF THE CHRISTIAN SCHOOLS, an order of Roman Catholic monks, devoted chiefly to the education of the poor. It was founded in France in 1679 by the Abbé La Salle. Its members cannot become priests. The order has under its control nearly 1,500 houses in various parts of the world. In the United States it has many colleges, academies and other institutions, mostly educational, under its management.

BROTHERS, RICHARD, the originator of the Anglo-Israelite craze; born in Newfoundland in 1757, and in 1772 entered the British navy, which he quitted with a lieutenant's half-pay in 1789. Refusing, from conscientious scruples, to take the oath requisite to enable him to draw his half-pay, he was reduced to great distress, and became an inmate of the workhouse. In 1793 he announced himself as "the Nephew of the Almighty, and Prince of the Hebrews, appointed to lead them to the land of Canaan," and in 1794 he published a book, *A Revealed Knowledge of the Prophecies and Times*. For prophesying the death of the king and the destruction of the monarchy he was committed in 1795 to Newgate, and thence soon after transferred to a lunatic asylum. His disciples included Nathaniel Halhed, the member of Parliament and Orientalist; Sharpe the engraver (see SHARPE, WILLIAM, Vol. XXI, p. 781); and Finlayson, a lawyer from Fife. Brothers was released from the asylum in 1806, and died Jan. 25, 1824.

BROUGH, JOHN, the "war governor" of Ohio; born at Marietta, Ohio, in 1811; died in Cleveland, Aug. 29, 1865. His early education was obtained chiefly in printing-offices, and he fitted himself to enter the Ohio University. He was for a time proprietor of the *Washington County Republican* and later of the Lancaster *Eagle*. He was clerk of the Ohio senate, and afterward sat as a member of that body. Elected to the office of state auditor, he gave careful attention to the financial system. He was next connected with the Cincinnati *Enquirer* and at the same time practiced law. Each paper with which Mr. Brough was successively connected became, under his management, a powerful Democratic organ. In 1848 he left politics, but during the Civil War, in 1863, he was urged to accept the nomination for governor, Clement L. Vallandigham, who had been court-martialed and was then living in exile, being the opposing candidate. Brough was elected by a very large majority. He served the state with patriotism and fearlessness.

BROUGHAM, JOHN, an Irish actor and playwriter; born in Dublin, May 9, 1810; died in New York, June 7, 1880. His father, an Irishman of good family, died young, leaving his widow in great destitution. The son was brought up by an eccentric and rich uncle, who sent him to the University. The stage attracted him, and when his uncle met with financial misfortune the young man went to London in 1830, and entered the dramatic profession, finding a friend in Mme. Vestris, afterward Mrs. Charles Mathews, who at that time was manager of two theaters. For fifty years he followed the profession, as author of plays, manager of theaters, an actor in Dublin, London and New York, and was usually successful; yet, but for the generosity of friends, his last years would have been spent in poverty. A benefit was given him in New York, and an annuity bought with the proceeds. He wrote *Life in the Clouds; Love's Livery*; *Enthusiasm; Playing with Fire;* and many other plays. He

was editor and proprietor of the *Lantern*, a comic paper, and published collections of his writings, entitled *A Basket of Chips* and the *Bunsby Papers*.

BROUGHTON, RHODA, an English novelist; born at Segrwyd, North Wales, Nov. 29, 1840. Her first work, *Cometh Up as a Flower*, published in 1867, was at once popular, and was closely followed by *Not Wisely, but Too Well* (1867); *Red as a Rose is She* (1870); *Nancy* (1873); *Joan* (1876); *Belinda* (1883); *Doctor Cupid* (1887); *Alas* (1890); *Mrs. Bligh* (1892); and *A Beginner* (1894). She has spent much of her time at Oxford, and later resided at Broughton Hall, Cheshire.

BROUGHTY-FERRY, a town of Forfarshire, Scotland, and a favorite watering-place. See DUNDEE, Vol. VII, p. 536.

BROUSSON, CLAUDE, a Huguenot martyr; born in Nimes in 1647. He was educated for the law, and practiced in Toulouse with marked success. He denounced the persecution of the Huguenots, and after the revocation of the Edict of Nantes in 1685, his house became the refuge and rendezvous of leaders of the sect. These meetings led to an outbreak in Toulouse, and Brousson was compelled to flee to Switzerland. In Lausanne he was consecrated to the ministry, and returned to France, and at the risk of his life preached in the caves of the Cévennes, these meetings becoming famous as the *assemblées du désert*. In 1693 he went to Holland, and after traveling through Europe in the cause of the Protestants, he re-entered France from the Jura Mountains and commenced to preach as he had done before, but he was captured, conveyed to Montpellier in 1697, tried on a charge of treasonable conspiracy with the Duke of Schomberg to invade France, and was condemned and broken on the wheel, Nov. 4, 1698. He was the author of *L'État des Réformés de France* (1684); *Relation Sommaire des Merveilles que Dieu Fait en France dans les Cévennes* (1694); *La Manne Mystique du Désert* (1695); besides *Letters*, addressed to the clergy of France and Europe.

BROUSSONETIA. See MULBERRY, Vol. XVII, p. 13.

BROWN, AARON VENABLE, an American statesman; born in Brunswick County, Virginia, Aug. 15, 1795; died in Washington, District of Columbia, March 8, 1859. A lawyer, in the legislature almost continuously from 1821 to 1832, he was elected to Congress in 1839, 1841 and 1843; was governor of Tennessee, and held other political offices under the Democratic party, and was Postmaster-General under President Buchanan. He instituted some reforms in his department, such as shortening the mail route to California by crossing the Isthmus of Tehuantepec.

BROWN, BENJAMIN GRATZ, an American statesman and soldier; born in Lexington, Kentucky, May 28, 1826; died in St. Louis, Missouri, December 13, 1885. He was graduated at the Transylvania University, in his native city, in 1845, and at Yale in 1847; studied law at Louisville, and about 1850 took up his residence in St. Louis. He was a member of the Missouri legislature from 1852 to 1858, during which time he established the *Missouri Democrat*, which advocated Republican sentiments. During the Civil War he favored the Union; raised a regiment, afterward commanding a brigade of militia. From 1863 to 1867 he was United States Senator from Missouri, and in 1870 was elected governor of the state. In 1872 he was candidate for Vice-President on the Greeley ticket.

BROWN, CHAD OR CHADD, elder in the Baptist Church. The dates of his birth and death are uncertain, but he probably died in 1665. He was the first elder of the oldest church of the denomination in America, and was chosen to succeed Roger Williams as leader in the Providence colony. Many religious and civil controversies arose in the settlement, which, but for Elder Brown's firmness and judicious rulings, would have been settled by physical force. The good elder earned the name of "Peacemaker," and to his memory a stone was erected over his grave a century after his death.

BROWN, FORD MADOX, author and painter; born at Calais, France, in 1821. He pursued his earlier studies at Antwerp under Baron Wappers. After a brief period spent in portrait-painting in England, he resided for three years in Paris, where he produced works intensely dramatic in feeling, but somber in coloring. A visit to Italy about 1845 led him to seek greater variety and richness of coloring, and its results were apparent in his subsequent works. In 1850 he was a contributor of verse, prose and design to the pre-Raphaelite paper, *The Germ*. (See ROSSETTI, Vol. XX, pp. 858, 859). He is known to some extent as a book-illustrator, and among the examples of stained glass which he designed are windows in St. Oswald's Church, Durham. He died Oct. 6, 1893.

BROWN, OLIVER MADOX, son of the preceding, author and artist; born at Finchley, near London, England, Jan. 20, 1855; died Nov. 5, 1874. At the age of 12 years he executed a water-color picture, *Margaret of Anjou and the Robber*, of very considerable merit; two years later his *Chiron* was shown at the Dudley exhibition; in 1870 his equestrian *Exercise* found a place in the Royal Academy, and already several of his designs had been engraved. In 1871–72 he wrote his first novel, *The Black Swan*, a marvelous production for a lad. The tales of *The Dwale Bluth* and *Hebditch's Legacy*, with some minor pieces, were incomplete at the time of his early death.

BROWN, FRANCIS, an American author; born in Hanover, New Hampshire, Dec. 26, 1849; was graduated at Dartmouth College in 1870, and at the Union Theological Seminary in 1877. After studying in Europe he was, in 1879, appointed instructor in the Union Theological Seminary, in 1881 associate professor of Biblical philology, and in 1890 professor of Hebrew. He edited *The Beginnings of History*, from the French of F. Lenormant (1882), and published *Assyriology* (1885), and, with Dr. R. D. Hitchcock, *The Teachings of the Twelve Apostles* (1884).

BROWN, GEORGE, Canadian journalist; born in Edinburgh, Scotland, Nov. 29, 1818; died in Toronto, May 9, 1880. He assisted his father in the printing business in Toronto, then came to New York, where he published the *British Colonist* for

his father. He returned to Canada, and in 1844 established *The Globe.* Twenty years later, having made this a successful daily paper, he started the *Canadian Farmer.* In 1852 he entered the Canadian Parliament, and soon became a powerful leader. In August, 1858, he was called to assist in forming a government, and the Brown-Dorion administration came into being; but on account of dissatisfaction in the assembly, Brown and his colleagues resigned. In the movement for constitutional changes which was begun in 1864, he was leader of the reform section, and the report of the committee which he formed was carried out in 1869. He was twice offered the honor of knighthood; sat in many public conferences; was sent as delegate to London in 1865, and to Washington, in 1874, to assist in formulating a commercial treaty. He declined the lieutenant-governorship of Ontario in 1875. Mr. Brown's death resulted from his being shot in the leg by a discharged employee. In Queen's Park, Toronto, there is a statue which was erected to his memory in 1884.

BROWN, Sir George, British general; born at Linkwood, near Elgin, Scotland, in 1790; died at Linkwood, Aug. 27, 1865. He entered the army in 1806; served through the Peninsular campaign (1808–13) and in 1814 joined Ross's expedition against the United States. In the Crimean War (1854–55) he commanded the Light Division, and was severely wounded at Inkerman. In 1860 he became commander-in-chief in Ireland.

BROWN, George Loring, an American painter; born in Boston, Massachusetts, Feb. 2, 1814; died in Malden, Massachusetts, June 25, 1889. He studied art in Boston under Washington Allston, and in Paris with Eugene Isabey, and became noted as a landscape-painter. Some of his best pictures are *The Bay of New York; Crown of New England* (purchased by H.R.H. the Prince of Wales); *Niagara by Moonlight; Venice;* and *Doge's Palace at Sunrise.*

BROWN, Goold, an American grammarian; born in Providence, Rhode Island, March 7, 1791; died in Lynn, Massachusetts, March 31, 1857. He was of Quaker descent; taught school in Rhode Island and in a Friends' school in Dutchess County, New York, and in 1813 removed to New York City, where he conducted an academy for over twenty years. He published grammars which were great improvements on those previously in use, and were authorities for years. Their titles were *Institutes of English Grammar; First Lines of English Grammar; A Grammar of English Grammars.*

BROWN, Harvey, an American soldier; born in Rahway, New Jersey, in 1795; died in Clifton, New York, March 31, 1874. In 1818 he graduated at the United States Military Academy, and served successively in the Black Hawk expedition; in Florida, in 1836, in the campaign against the Seminoles; on the Canadian border; and again on the Mexican border. He was ordered against the Seminoles in 1852–53, and again in 1854–56; was commander of the Washington defenses until April 4, 1861; was ordered to Fort Pickens, Florida, in 1861–62, and his last important services were rendered in New York City, July 12–16, 1863, during the draft riots. For this he was brevetted major-general of the regular army. In the same year he was retired from active service, having had his name on the army register for more than forty-five years.

BROWN, Henry Armitt, an American orator; born in Philadelphia, Pennsylvania, Dec. 1, 1844; died there, Aug. 21, 1879. He was a Yale graduate, studied law in Columbia, traveled in Europe and the East, and on his return became famous as an orator on historical, social or political occasions. His chief historical addresses were collected and published in one volume at Philadelphia in 1880.

BROWN, Henry Billings, associate justice of the supreme court of the United States, was born in South Lee, Massachusetts, March 2, 1836; admitted to the Michigan bar in 1860; appointed assistant United States attorney by President Lincoln; and appointed judge of the state circuit court of Wayne County. He returned to active practice until 1875, when President Grant appointed him district judge for the eastern district of Michigan. On Dec. 23, 1890, he was appointed associate Justice of the supreme court to succeed Justice Samuel F. Miller.

BROWN, Henry Kirke, an American sculptor; born in Leyden, Massachusetts, Feb. 24, 1814; died in Newburgh, New York, July 10, 1886. At an early age he began to paint, and at 17 he studied with Chester Harding, a portrait-painter, in Boston. Removing to Albany, he made portrait busts of Dr. William B. Sprague, Erastus Corning and others. In Italy (1842–46) he produced *Ruth;* a group representing a boy and a dog, now owned by the Historical Society of New York; a *Rebecca;* and a *David,* which was destroyed. In 1846 he returned to New York, where, assisted by skilled foreign workmen, he achieved the first bronze casting ever done in America. In 1848 he went among the Indians and modeled many interesting subjects, some of which were reproduced in bronze. In 1855 he finished the equestrian statue of *Washington* in Union Square, New York. He constructed the altar-piece for the Church of the Annunciation in New York, and modeled portrait busts of his friends, Dr. Willard Parker and William Cullen Bryant. He made the statue of De Witt Clinton for Greenwood Cemetery. For several years he lived in South Carolina, where he was engaged on an ideal group to adorn the Columbia State House. Unfortunately, Sherman's army destroyed this work of art before it had been completed. Mr. Brown's average work suffers by comparison with the highest standards of the sculptor's art. But his best efforts evince earnestness, dignity and no small degree of artistic talent. His equestrian statue of *General Winfield Scott,* at the National capitol, is considered his best work, although all his equestrian statues show a decided love for horses and a thorough knowledge of their finer points. Among the other works executed by this artist are *Dr. George W. Bethune,* in Parker Institute, Brooklyn; *Lincoln,* in Union Square, New York; *General Philip Kearny; Richard Stockton;* an equestrian statue of *General Nathaniel Greene;* and two ideal statues, one of *Hope,* the other a *Discobo-*

*lus.* Most of Mr. Brown's works are owned by public or national associations. His equestrian statues are ranked as his best.

BROWN, JACOB, an American soldier; born in Bucks County, Pennsylvania, May 9, 1775; died in Washington, District of Columbia, Feb. 24, 1828. In early life he engaged in surveying, teaching, writing for newspapers, studying law and in military service. He fought at Ogdensburg, Oct. 4, 1812; at Sackett's Harbor, May 29, 1813; at Chippewa, July 5, 1814; at Lundy's Lane, July 25, 1814; and at Fort Erie, Sept. 17, 1814. He was very successful in leading his troops, and Congress awarded him thanks and a gold medal. He succeeded to the chief command of the United States army, March 10, 1821.

BROWN, JOHN, grandson of Chad Brown (q.v., in these Supplements); born in Providence, Rhode Island, Jan. 27, 1736; died there, Sept. 20, 1803. He was a wealthy merchant, and his were said to be the first ships trading between Rhode Island and the East. Anticipating the American Revolution, he had his ships from the East freighted with gunpowder, which went to supply the soldiers of Cambridge. The corner-stone of the first building of Brown University was laid by him. He was one of the largest contributors to that institution, and was for twenty years its treasurer.

BROWN, JOHN CALVIN, soldier; born in Giles County, Tennessee, Jan. 6, 1827; died in Macon County, Tennessee, August 17, 1889. He was graduated at Jackson College, Tennessee, 1846, and studied law. He traveled extensively in Europe, Asia and Africa, and returning to America was chosen elector of his Congressional district on the Whig ticket in 1860. He entered the military service of the state of Tennessee in 1861 as captain of a company; was elected colonel of a regiment, and transferred to the service of the Confederate States, in which he was successively promoted to the grades of brigadier and major-general. He was made prisoner at Fort Donelson; was a prisoner of war at Fort Warren, Massachusetts, and after seven months was exchanged, and re-entered the Confederate army with his command at Chattanooga in September, 1862. He was with General Bragg on his Kentucky campaign; participated in the battles of Perryville, Kentucky; Murfreesboro, or Stone River; Chickamauga; Missionary Ridge; Kenesaw Mountain; in the battles near Atlanta, Georgia; at Jonesboro, Georgia; and at Franklin, Tennessee. At the latter battle he commanded a division of Tennesseeans (formerly Cheatham's division), and when the advanced and inferior line of the Federal forces had been stormed and routed, and had sought refuge in their main line, strongly intrenched, and near a half-mile to the rear, he directed his command to "go into the works with them." His order was obeyed, and a portion of his division, under command of Brigadier-General George W. Gordon, were the only Confederate troops that made a breach in the main line of the Federal works. But the Federals were opportunely re-enforced at that point and the Confederates were driven back to and on the opposite side of the main line of works, Gordon being captured and the battle proving a disaster to the Confederate arms.

After the war, General Brown was elected president of the constitutional convention of his state (1870), and was twice elected governor of Tennessee, serving as such from 1871 to 1875. Retiring from public life, he became vice-president of the Texas Pacific railroad, and subsequently became solicitor for Jay Gould's Western system of railroads, and receiver of the Missouri Pacific railroad.

BROWN, JOHN CARTER, an American philanthropist and book-collector; born in Providence, Rhode Island, Aug. 28, 1797; died there, June 10, 1874. He was a son of the merchant-philanthropist, Nicholas Brown. In 1816 he graduated at Brown University, and entered the counting-room of his father. He gathered a library of Americana, which numbered 6,235 volumes, among which were 48 containing the journals and letters of the North American Jesuits. He was a liberal patron of Brown University, supplying the funds (more than $160,000) for erecting and equipping its fire-proof library building.

BROWN, JOHN GEORGE, an American painter; born at Durham, England, Nov. 11, 1831, and studied at Newcastle-on-Tyne and at Edinburgh, where he received a medal from the Royal Scottish Academy in the antique class of 1853. He removed to New York City in the latter year, and was made a member of the National Academy of Design. He established his studio in New York City, and received a medal from Boston and one from San Francisco in 1877. He was an original member of the Water-Color Society (1866), and received honorable mention at the Paris Exposition of 1889. He exhibited at the National Academy, in 1863, *Curling in Central Park*, which he sent to the Centennial Exhibition at Philadelphia in 1876, where it received much praise. Among his other works are *Pennies in Prospect* (1873); *Hiding in the Old Oak* (1874); *Yes or No?* (1876); *Now We Are Off* and *The Country Gallants* (1876); *The High Note* (1877); *By the Sad Sea Waves* (1878); *Pull for the Shore* (1878); while among his water-color exhibits are *The Swing* (1871); *The Rustic Milliner* (1874); *A Well-Fished Preserve* (1876); and *Crossing the Brook* (1877).

BROWN, JOHN PORTER, an American Orientalist; born in Chillicothe, Ohio, Aug. 17, 1814; died in Constantinople, Turkey, April 23, 1872. He was in the naval service till his uncle, David Porter, was sent as minister to the Porte in 1832, when he accompanied him abroad, and giving his attention to the study of Oriental literature, achieved a high reputation. In various capacities he spent forty years in Turkey, during the last fourteen of which he was secretary of legation, and a portion of the time *chargé d'affaires*. He published *Dervishes, or Oriental Spiritualism* (1858); *Turkish Evening Entertainments*, a translation from Ahmed Ben Hemden; and *Ancient and Modern Constantinople*, also a translation. He frequently contributed to American magazines.

BROWN, JOSEPH EMERSON, war governor of

Georgia, was born in Pickens County, South Carolina, April 15, 1821; graduated at Yale in 1846, and became a lawyer in Georgia. He was elected to the state senate in 1849, became judge in 1855, and was governor of Georgia from 1857 to 1865. At the outbreak of the Civil War, Governor Brown, who was an active secessionist, seized the United States forts and the arsenal at Augusta, Georgia. After the war he advised his state to accept the terms of reconstruction offered, and for a time he acted with the Republican party. He was defeated for United States Senator in 1868, and was appointed chief justice of the state supreme court in the same year. In 1872 he again joined the Democratic party, during the Greeley campaign; in 1880 he was elected United States Senator for the unexpired term of General Gordon, and was re-elected in 1884 for the term ending March 3, 1891. He donated $50,000 to the State University, and as much more to the Southern Baptist Theological Seminary at Louisville, Kentucky. He died Nov. 30, 1894, and left an estate valued at over $2,000,000.



JOSEPH E. BROWN.

BROWN, MATTHEW, an American educator, was born in Northumberland County, Pennsylvania, in 1776. He graduated at Dickinson College, Carlisle, Pennsylvania, in 1794; studied divinity in 1796, and began to preach in 1799. He was the first president of Washington College, and in 1822 accepted the presidency of Jefferson College. Several American universities conferred honorary degrees upon him. He died July 29, 1853.

BROWN, NICHOLAS, an American philanthropist, great-grandson of Chad Brown (q.v., in these Supplements); born in Providence, Rhode Island, April 14, 1769; died there, Sept. 27, 1841. He was a graduate of Rhode Island College, and for many years was a member of the state legislature. Rhode Island College was renamed in his honor. He gave nearly $100,000 to Brown University. Hope College and Manning Hall were erected by him, the former being named after his sister, Mrs. Hope Ives. For 50 years he was officially connected with the college. He was a liberal benefactor of other literary or charitable institutions.

BROWN, OLYMPIA, an American preacher and lecturer; born in Prairie Ronde, Michigan, Jan. 5, 1835. She was educated at Mount Holyoke Female Seminary and at Antioch College, Yellow Springs, Ohio. She studied theology at the Universalist School at Canton, New York, and in 1864 was installed pastor of a church in Weymouth, Massachusetts. She has since been pastor of Western churches, has lectured, and is president of the Wisconsin Woman Suffrage Association. She is married to Henry Willis.

BROWN, ROBERT, a Scotch traveller; born at Campster, Caithness-shire, March 23, 1842. He was an honors' student at Edinburgh University, and studied at Leyden, Copenhagen and Rostock, from which he received the degree of Ph.D. In 1861 he visited Jan Mayen, Spitzbergen, and Greenland and the western shore of Baffin's Bay, discovering the cause of the discoloration of the arctic ocean. From 1863 until 1866 he traveled in the Pacific Islands, Alaska, Venezuela, the Bering sea-coast and Vancouver, during which time he sent many new plants to Europe and made charts of the interior of Vancouver. In 1867 he visited Greenland a second time, from his observations at this time formulating theories which have been since confirmed by Peary and Nansen. He later visited the Barbary states of North Africa, and returning to Britain, lectured in various institutions in Edinburgh, Glasgow and elsewhere. A number of new species and places have been named after him. His arctic researches have been embodied in works published in Germany. His chief individual works consist of *The Races of Mankind* (1873–76), afterwards published as *The Peoples of the World* (1882–85); *Our Earth and Its Story* (1887–88); besides which he has edited *Science for All*, in five volumes; *Bibliography of Morocco*, in conjunction with Lord Playfair; and *Leo Africanus*, for the Hakluyt Society.

BROWN, ROBERT, JR., an English author; born in Barton-on-Humber, July 6, 1844; was educated at Cheltenham College, and is a solicitor and registrar of the court of his native town. He is a member of the Society of Biblical Archæology and a fellow of the Antiquarian Society. Among his works are *Poseidon: A Link between Semite, Hamite and Aryan* (1872); *The Great Dionysiak Myth* (1877); *Language, and Theories of Its Origin* (1881); *The Unicorn: A Mythological Investigation* (1881); *The Law of Cosmic Order* (1882); *Eridanus: River and Constellation; A Story of the Southern Archaic Asteriams* (1883); *The Myth of Kirké* (1883); *A Trilogy of the Life to Come, and Other Poems* (1887); *The Etruscan Numerals* (1889); *Remarks on the Tablet of the Thirty Stars, or Babylonian Lunar Zodiac* (1890).

BROWN, SAMUEL, an American physician; born in Rockbridge County, Virginia, Jan. 30, 1769; died in Alabama, Jan. 12, 1830. He graduated at Dickinson College, and studied medicine with Dr. Rush in Philadelphia. For six years he was professor of medicine in Transylvania University, Lexington, Kentucky, and afterward assisted in establishing a medical school in that city. Dr. Brown had a large practice, yet found time to originate various industrial and agricultural improvements, the clarification of ginseng being one of these. He was founder of the first American medical association.

BROWN, SAMUEL GILMAN, an American educator and author; born in North Yarmouth, Maine, Jan. 4, 1813; graduated at Dartmouth in 1831, at Andover Theological Seminary in 1837, and ordained a Congregational minister in 1852. He was appointed professor of oratory and *belles-lettres* at Dartmouth in 1839, of intellectual philosophy and political economy in 1863, and president of Hamilton College in 1867, resigning in 1881. His works include *Biography of a Self-Taught Man* (1847) and *Life*

*of Rufus Choate* (1862). He died in Utica, New York, Nov. 5, 1885.

BROWN, Sir William, founder of the Liverpool Free Library; born at Ballymena, County Antrim, Ireland, in 1784; died March 3, 1864. In 1809 he established at Liverpool a branch of his father's linen business, and laid the foundation of one of the largest mercantile firms in the world. He took a prominent part in local and public affairs, being especially interested in the promotion of education among the people. In 1846 he was elected member of Parliament for South Lancashire, and was thrice afterward re-elected. In 1857, at a cost to himself of £40,000, he founded the Free Public Library of Liverpool, and in 1859 he raised a corps of volunteer artillery. He was made a baronet in 1863.

BROWN, Mount, in the Rocky Mountains, near the source of the Columbia River, and on the borders of British Columbia and Alberta. It is 16,000 feet high.

BROWNE, Edward Harold, English divine; born March 6, 1811, at Morton House, Bucks, and educated at Eton and at Emanuel College, Cambridge, where he became a fellow and tutor. He was made professor of Hebrew at Lampeter in 1841, and Norrisian professor of divinity at Cambridge in 1854; was consecrated bishop of Ely in 1864, and translated to Winchester in 1873. His works comprise several volumes of sermons, a book on the Pentateuch, and the well-known *Exposition of the Thirty-nine Articles* (1850; 12th ed. 1882). He died Dec. 19, 1891.

BROWNE, Frances, known as the "Blind Poetess of Ulster"; born in the village of Stranolar, County Donegal, Ireland, Jan. 16, 1846, of which place her father was post-master. She became blind soon after birth, but received the benefits of education, and exhibited the poetic instinct while quite young, her verses being published in the local newspapers, and creating comment. In 1841 she had the good fortune to attract the attention of the editor of the *Athenæum*, who published a series of her poems in that journal, which paved the way for her entrance into London literary circles. Her first published book was *The Star of Atteghei* (1844); soon after the appearance of which she received a pension upon the recommendation of Sir Robert Peel, which was increased in 1852. She next contributed a series of stories to *Fraser's Magazine*, *Chambers's Journal*, and the *Leisure Hour*, etc. Among her works are *Lyrics and Miscellaneous Poems* (1847); *Pictures and Songs of Home* (1856); *Granny's Wonderful Chair* (1856); *Our Uncle the Traveler's Tales* (1859); *The Castleford Case* (1861); *My Share of the World: An Autobiography* (1861); *The Hidden Sin* (1866); *The Exile's Trust: A Tale of the French Revolution* (1869); *The Dangerous Guest* (1875); *The First of the African Diamonds* (1877); etc. Several of her books were translated into French.

BROWNE, Hablot Knight, artist, the "Phiz" of many clever and humorous book-illustrations; born at Kennington, Surrey, England, June 15, 1815; died at West Brighton, July 8, 1882. He early showed a taste for drawing, and was apprenticed to Finden; but, disliking the laborious methods of line-engraving, he took to the freer processes of etching and water-color painting, and in 1883 gained a medal from the Society of Arts for an etching of *John Gilpin*. In 1836 Browne succeeded Seymour and R. W. Buss as illustrators of Dickens's *Pickwick*, competing successfully against Thackeray for the work; and he soon enjoyed a reputation which was continued and preserved by his designs for *Nicholas Nickleby*, *Master Humphrey's Clock*, *Martin Chuzzlewit*, *David Copperfield*, and other of Dickens's works. He also illustrated many of Lever's and several of Ainsworth's novels.

BROWNE, J. Crichton. See Crichton-Browne, in these Supplements.

BROWNE, John Hutton Balfour, an English jurist and legal writer; born in Dumfries, Scotland, Sept. 13, 1845; educated at Dumfries Academy and Edinburgh University; called to the bar by the Middle Temple in June, 1870. As a specialist Mr. Browne became well known by his *Medical Jurisprudence of Insanity* (1870) and *The Law of Carriers* (1874), a masterly work which secured for him the appointment of registrar and secretary to the Railway Commission. In 1874 he published *The Law of Rating*, and in 1880 *The Law of Railways*, both of which became standard legal textbooks. His legal practice was principally at the Parliamentary bar, where he was esteemed the leading authority on gas and water bills. Mr. Browne made an excursion into fiction in 1870; his *For Very Life* was praised by Lord Beaconsfield; a second novel was dedicated to his neighbor, Thomas Carlyle.

BROWNE, The Venerable Robert William, an English clergyman and educational writer; born at Kennington, near London, Nov. 12, 1809; educated at Merchant Taylors' School and St. John's College, Oxford. After a tutorship in his college was appointed, in 1835, to the professorship of classical literature in King's College, London. He was successively assistant preacher of Lincoln's Inn, chaplain to the bishop of Lichfield, senior chaplain to the forces in London, prebendary of St. Paul's, examining chaplain to the Bishop of Bath and Wells, archdeacon of Bath, rector of Weston-supermare and canon of Wells Cathedral. He wrote *Histories of Greece and Rome* for school use, translated many of the classics and won the honorary degree of Ph.D. from the University of Heidelberg by his erudite *Histories of Greek and Roman Literature*. He died Dec. 12, 1895.

BROWNELL, Henry Howard, author; born in Providence, Rhode Island, Feb. 6, 1820; died in East Hartford, Connecticut, Oct. 31, 1872. He studied law, but applied himself to teaching in Hartford. During the early part of the Civil War he versified Farragut's general orders to his fleet in the attack on New Orleans. The bright little poem came to Farragut's notice, and the poet and commander met each other. Through the influence of the latter, Brownell's desire to witness a naval battle was granted, for he was appointed acting ensign on the flagship *Hartford*. He was present at the battle of Mobile Bay. *The River Fight* and *The Bay Fight* were his best poems, and both obtained praise from

Oliver Wendell Holmes. Brownell published a volume of poems and a few other works.

BROWNELL, THOMAS CHURCH, bishop of the Protestant Episcopal Church; born in Westport, Massachusetts, Oct. 19, 1779; died in Hartford, Connecticut, Jan. 13, 1865. He studied at Brown, graduated at Union as valedictorian of his class in 1804, was appointed Greek and Latin tutor, professor of logic and *belles-lettres* in 1806; lectured on chemistry, and in 1814 was elected professor of rhetoric and chemistry. A little time previous to this his religious views had changed; he abandoned the Calvinistic theory, and began the study of theology, with the intention of becoming an Episcopal clergyman. He was ordained deacon in 1816, and two years later was elected assistant minister of Trinity Church, New York. In 1819 he was consecrated bishop. He labored earnestly for a church college in Connecticut, and in 1823 the charter for Washington (now Trinity) College was granted. He was its first president, but continued in office only a year, as the duties of his episcopate required his whole time. He organized churches in the South, published sermons and religious books, and during the 45 years of his episcopate ordained 179 deacons and confirmed 15,000 people.

BROWNIAN MOVEMENT, also and originally called *Brunonian Motion* or *Movement*, an incessant vibratory motion frequently observed in very small, solid particles when suspended in water, as when gamboge is rubbed up in water, and first described by Robert Brown (q.v., Vol. IV, pp. 385, 386). The same movements are also manifested by microscopic germs, but the Brownian movement is entirely physical, not vital. Its cause is somewhat obscure, but may perhaps be explained by the fact that the particles, being in delicate equilibrium, are extremely sensitive to change of temperature.

BROWNIE, kind of domestic spirit in the folklore of Scotland. See APPARITIONS, Vol. II, p. 204. For a modern limner of brownies, see PALMER, Cox, in these Supplements.

*BROWNING, ROBERT, an English poet, was born on May 7, 1812, in Camberwell, London. His father, a man of sturdy stock, was a diligent reader, whose 40 years of service in the Bank of England resulted in pecuniary independence. His mother was a woman of devout sensibilities, warmly attached to a dissenting church, for which the poet throughout his life showed a marked affection. The boy at 12 years of age had written a considerable number of verses, for which his father vainly sought a publisher. The child was fond of strange pets, was mystically pious, rather self-assertive, but not devoid of the health and good spirits that seldom deserted the man. The poems of Shelley and Keats, then far from being popular, riveted his attention and roused his enthusiasm when he was scarcely 14 years of age.



ROBERT BROWNING.

He was put in a school at Dulwich, acquired some knowledge of music, loved athletic exercises, cared little for mathematics, and left the benches of the University of London with his course of study incomplete. Browning's first published work, *Pauline, a Fragment of a Confession*, published in 1832, was of suggestive character, showed considerable art of metrical composition, and was recognized by a few, like John Stuart Mill and Dante Rossetti, as giving promise of good work to come. Fifty-seven years later the author brought it out in a revised form and much improved. In 1834 he was in St. Petersburg, connected with the British legation, but the following year he was again in London, and gave to the public *Paracelsus*, his father paying for the publication. Both of these works indicated the future lines of Browning's productiveness. The mental analysis that goes on in *Pauline* had to be made objective and dramatic, but the psychological quality was never to cease. The shadowy, legendary background of *Paracelsus*, over which the figures moved energetically, the clear lyrical passages and the lesson taught by *Paracelsus's* failure to understand his environment, are all characteristic of Browning's later genius. It did not appeal to the popular taste, but it did make friends of such diverse men as Leigh Hunt, Talfourd, Landor, Wordsworth and Dickens. So dramatic was it that Macready thought its author a suitable person to write plays with *rôles* in them for him. *Strafford*, a play founded on the hapless Earl of Strafford, appeared in 1837, and *Sordello*, after two years of labor, appeared in 1840. The obscurity of the latter not only kept it from general reading, but created prejudice against its author, which long retarded his recognition as a great poet. A version of it in prose by Miss Wall was brought out in 1887, under the title of *Sordello's Story*. The book did not pay for publishing, and Browning concluded to produce his own books in a cheap, serial form. Thus *Bells and Pomegranates* were produced in eight numbers. *Pippa Passes* was the first of this series. The story of *Pippa* is of a little silk-winder of Asolo, whose songs, as she passes on her festal day, have touched the soul with cheer and gladness. *Colombe's Birthday* (1843), the sixth number, was afterwards dramatized. The series ended in 1846 with *Luria* and *A Soul's Tragedy*. While this series was running, Browning published *Dramatic Lyrics* (1842) and the play *King Victor and King Charles*. Among the *Lyrics* was *The Pied Piper of Hamelin*, widely known by its incorporation into scores of school-readers. In 1843 came *The Blot in the 'Scutcheon*, which was a play written for Macready, but in which he did not perform, owing to a quarrel that sprang up between the two men over its dramatic action and sequence. However, it was brought out at the Drury Lane Theatre in due time, but was not well received. At this time lack of appreciation weighed heavily upon the poet, but instead of giving away to depression, his sturdy spirit rose with increasing indifference to fame and to criticism. He went on his own way, self-contained, irrepressible and full of his own projects.

He was married in 1846, clandestinely, at St. Pancras's Church. This romance, that never ended, is

*Copyright, 1896, by The Werner Company.

partly told in the sketch of ELIZABETH BARRETT BROWNING, Vol. IV, p. 391. Perhaps the subject of spiritualism, for which the wife had some tenderness and the husband none, was the only false note sounded in their union. It is said that during their married life they dined only twice apart, and he thought himself a plodder beside her vivacious genius. A single instance of personal invective from him grew out of his devotion to her. At her death Fitzgerald unfortunately expressed his gratification that there could be no more *Aurora Leighs*, and it came to Browning's ears. His retort was vehement and scornful, and, as he confessed, too much so to come "from lips once sanctified by hers." Their married life was mostly passed in Florence.

In 1850 he published *Christmas Eve* and *Easter Day; Men and Women* came five years later. His *Dramatis Personæ* (1864) are strange studies; their exploitations of mental conditions are sometimes grotesque, often remote and unusual, in their use of antiquarian lore. It was not because he had curious learning, or delighted in strange phases of life, that he wrote on the religion of an abject creature in *Caliban Upon Setebos*, or on the self-revelations of old *Cleon* to his friend King Protus, or of the evolution of the painter's art in *Andrea del Sarto;* but because he wished to disengage himself from the conventional world about him and to work out his own thoughts in a strange and hazy atmosphere. He loved to study the subtle processes of the soul, not as an analyst, but as an artist. Through all these studies there is a psychological elaboration that transcends Goethe's *Faust*, to which he owed so little.

In 1861 Mrs. Browning died, and her husband left Florence, never to abide there again. The last of his days were passed between Venice and London. In the latter city he dwelt with his sister, in Bayswater, near Hyde Park, until in 1887 they removed to Kensington. Late in life he bought an old palace on the Grand Canal in Venice, once used for studios, and there he died, on the 12th of December, 1889, his failing hearing gratified by learning that the first edition of his *Asolando* was nearly exhausted. He was buried at Westminster Abbey on the last day of the year.

In London, Browning indulged his social tastes with welcome freedom. He was known in many a drawing-room and at many a table for the richness and cheer of his conversation, although, like Coleridge before him, that conversation was largely in monologue. The first work that followed Mrs. Browning's death was *The Ring and the Book* (1869). The book indicated in this title was picked up in a stall at Florence, and was a record of a murderer. Out of the gold of this old tale the author has made a ring with which he would unite Italy and England in greater sympathy. It is a response to that ardent love of his wife for the land of sunshine and of art which drew from her some of her finest outpourings of song. It marked the turn of public sentiment, for his popularity now began and continued to the end. The heroine of this book is regarded, in some aspects, as an attempt of his to typify elements in the nature of his dead wife.

Browning now turned his thoughts towards Greek themes. The art of this people he had discoursed upon in *Cleon*, but he regarded it only as a tribute to the larger poesy of humanity—a step in the growth of that art. Browning's philosophy was, that all things are limited; that they are wrought to a failing end, and out of their decay new life arises: the ripples that circle about a man or an age move on in expanding and lessening circles until they break, to be succeeded by others of larger energy and greater momentum. "Most progress is most failure." With him health and happiness were vital virtues; he had no patience with theories of decadence for the race, although the decadence of man and times was part of his philosophy. His attitude towards life and all of its promise was full of indomitable courage,—perhaps is best emphasized in his own epilogue to his last book, *Asolando*, which has so often been quoted, and seems like an unconscious epitaph from his own hand:

> "One who never turned his back, but marched breast forward;
> Never doubted clouds would break;
> Never dreamed, though rights were worsted, wrong would triumph:
> Held we fall to rise, are baffled to fight better,
> Sleep to wake."

A winsome Greek girl, tall and fair as the Greeks loved them, full of undisciplined, natural impulses, radiant with joy and self-confidence, tells her story before companions, and of her resolution—soon broken, as such resolutions so often are—to stay unmarried. This is the theme of *Balaustion's Adventure* (1871), in which there is a rendering of *Alcestis*, and to which *Aristophanes's Apology* (1875) came as a sequel. Browning translated the *Agamennon of Æschylus*, it is supposed, to vindicate his theory that Greek poetry was not a finality in literary art. *Fifine at the Fair* (1872), and perhaps *The Statue and the Bust*, show Browning's thought at his greatest deviation from accepted views of morality. *Fifine* is a gipsy; Elvira is a steadfast and chaste wife, and their characters are accentuated by displaying them one against the other. The husband professes an equal interest in either; but for diverse reasons: one ministered to his sensuous and the other to his spiritual nature; and in the combination he finds an ideal marriage. He did not wish either to be like the other; grants man a large license, but demands fidelity in woman. His scheme breaks down, not because Elvira is exacting or unforgiving, but because the man's moral nature is not proof against the insidious depravities involved in the scheme. Elvira's triumph comes at the end, with the discovery that "Love is all, Death is naught," and man and wife are restored to each other in perfect union. It reads like an apology for license; it is a psychological study of it. In *The Statue and the Bust* he deals again with a futile, adulterous passion.

*The Red Cotton Night-Cap Country, or Turf and Towers* (1873), is a tale of peasant-life in Brittany, and one of the least interesting of his books. Students of Browning's writings have sought to find some revelation of his religious belief in the *Two Poets of Croisic* and *La Saisiaz*, both published in 1878. In fact, the influence of his mother's evan-

gelical spirit and teachings never vanished from his mind, but seemed curiously blended with his excursions into sociology and idealism. The last book from his pen was *Asolando, Fancies and Facts*. Its appearance in the book-stalls of London was so nearly simultaneous with his death that he only survived long enough to learn the fact.

Among his books not yet named it remains to transcribe the titles of *Prince Hohenstiel-Schwangau, Saviour of Society* (1891); *The Inn-Album* (1875); *Pacchiarotto* (1867); two series of *Dramatic Idylls* (1879–80); *Jocoseria* (1883); *Ferishtah's Fancies* (1884); *Parleyings with Certain People of Importance in their Day* (1887).

During the last ten years of Browning's life there grew up what may be called a cult for the study of his works. It took the form of clubs in many cities, and gave rise to abridgments, annotations, compilations of selected poems, criticisms and stories, in which some writers sought fame and others pay. The poet's work offered a large field and temptations to such authors. His obscurities of thought, his subtle or mystic fancies, his involved or broken style, lent themselves effectively to such study.

In regard to the form his works took, it needs to be understood that Browning's genius was essentially dramatic; but it was a drama without scenery and without dialogue; often with slight plot and little narration, frequently producing the impression of more ingenuity than art. His method was monologue, which he elaborated and even strained to extraordinary effects. Punctuation, exclamations, questions, interjections, are part of his machinery of action; transitions are abrupt, sense is often incomplete, but with it all there is a constant virile force and animation. He loved compact expression, shunned abstraction, labored to make the ideal concrete. To use his own phrase, he loved the "soul clothed in circumstance." At times he arose to glorious lyrical strength and purity. The language has hardly a ballad more animated, majestic and delightfully metrical than *How they Brought the Good News from Ghent to Aix*. Equally stirring is *Hervé Riel*, a metrical version of the Battle of La Hogue. Not infrequently did he rise to high lyrical art; but predominantly his eye was upon the soul that was in man; and he followed its moods and passions with such subtlety and into such strangenesses that he has been properly distinguished as "the poet of idiosyncrasies." Of women he could write without understanding. He was fond of their company, but strangely blundered in anticipating how they would act under given conditions. His manner was genial, effusive; his presence sometimes seemed obtrusive, but he suffered from embarrassment in company, and perhaps these were the methods with which he would suppress the revelation of it.

He left an only son, Robert Wiedmann Barrett Browning, of Florentine birth, who took up his abode in the Venetian palace on the Grand Canal, and has fame as a sculptor and painter.

A complete revised edition of Browning's works, in 17 volumes, appeared in 1889. Furnivall published a *Bibliography* up to 1881; Corson's *Introductions to the Study of Robert Browning* is a sympathetic criticism founded on much thought; William Sharp and Mrs. Sutherland Orr have published two of the best biographies of him, Mrs. Orr having been indebted to the reminiscences of the poet's sister.

D. O. Kellogg.

BROWNLOW, William Gannaway, born in Wythe County, Virginia, Aug. 29, 1805; died in Knoxville, Tennessee, April 29, 1877. He was an itinerant Methodist preacher, who, in 1828, began to interest himself in politics. He soon became known as the "Fighting Parson." He was opposed to nullification, in favor of slavery, but opposed to secession. He was editor of the Knoxville *Whig* from 1838 to 1861, at which last date his paper was suppressed. He was persuaded to leave the town, for he would not take the oath of allegiance to the Confederate government, but on his return was treacherously arrested and imprisoned. Judah P. Benjamin regarded him with distrust, and advised his being set at liberty. Brownlow was put inside the Union lines, and then made a trip North, lecturing in prominent cities to large audiences. In 1864 he returned to Tennessee, and the following year was elected governor. He served a second term. The Kuklux trouble broke out at this time, and the governor was obliged to proclaim martial law in nine counties. He was elected to the United States Senate in 1869, and at the close of his term returned to Knoxville, purchased a controlling interest in his old newspaper, and edited it till the time of his death.

BROWN-SÉQUARD, Charles Édouard, physiologist and physician; born at Port Louis, Mauritius, April 8, 1818, his father being a sea-captain from Philadelphia, Pennsylvania, who married on the island a lady named Séquard. The son studied at Paris, and was graduated M.D. in 1846. He afterward received numerous prizes for the results of valuable experiments in various departments of physiological science, principally connected with the blood, the brain and the nervous system. He also edited several medical journals, and held the chair of medicine in the Paris School of Medicine, and from 1878 the chair of experimental medicine in the College of France, and again in the French Academy of Sciences. He occupied the chair of physiology in Harvard College from 1864 till 1869. He also practiced medicine in New York City from 1873 to 1878. His announced discovery of an *elixir vitæ* subjected him to much ridicule and criticism. He set forth this discovery in a volume published in 1890. He died in Paris, April 2, 1894.

BROWNSON, Orestes Augustus, born in Stockbridge, Vermont, Sept. 16, 1803. In 1822 he united with the Presbyterian Church at Ballston, New York, but his religious views changed, and three years later he became a Universalist, preached in New York and Vermont, and conducted successfully the *Gospel Advocate* and the *Philanthropist*, organs of Universalism. In 1828, attracted by the views of Robert Owen, he helped to form the Workingmen's Party. The writings of Dr. Channing next influenced him to study

Unitarianism, and he became a preacher in that denomination in 1832. He was one of the founders of the Locofoco Party in New York, and a supporter of Van Buren. He started the Boston *Quarterly Review*, which was afterward incorporated with the *Democratic Review* of New York. In 1844 he joined the Roman Catholic Church. Dr. Brownson advocated his ideas on politics and religion in the paper published in New York as *Brownson's Quarterly Review*, then the leading Roman Catholic periodical of the United States, in which his pro-slavery attitude was as pronounced as it was bitter. His orthodoxy was questioned, but Cardinal Franzelin pronounced his published works undeserving of censure. His last years were spent at the home of his son in Detroit. The collected edition of his works is published in 19 volumes, among these being *Essays and Reviews; The Spirit Rapper: An Autobiography; Charles Elwood, or the Infidel Converted;* and *Conversations on Liberalism and the Church.* In his political relations Dr. Brownson was unstable and liable to a change of views. As a stump speaker and as a writer he was vigorous and acrimonious. He died in Detroit, Michigan, April 17, 1876.

BROWN-SPAR, a name often given by mineralogists to certain varieties of dolomite. See MINERALOGY, Vol. XVI, p. 397.

BROWNSTOWN, a town of southern Indiana, county seat of Jackson County; situated on a branch of the Baltimore and Ohio railroad, 46 miles N. of New Albany, in a rich timber and orchard region. The town has flour, lumber and sash manufactures and an extensive canning industry. Population 1890, 1,422.

BROWNSVILLE, a town of Fayette County, Pennsylvania, situated on the east bank of the Monongahela River, and on the line of the Pennsylvania railroad, about 30 miles S. of Pittsburg. It contains extensive manufactories of glass, iron, machinery, flour, steam-engines and lumber. Coal and iron are mined in the vicinity. Population 1890, 1,417.

BROWNSVILLE, a town of western Tennessee and county seat of Haywood County. It is situated in a fertile cotton-growing region, on the Louisville and Nashville railroad, about 5 miles N. of the Hatchie River and 57 miles N.E. of Memphis. It is the seat of four Baptist and Methodist colleges, and an important shipping-point for cotton. Population 1890, 2,516.

BROWNSVILLE, a city of Texas, county seat of Cameron County, and a port of entry. It is situated on the Rio Grande River, about 35 miles from the mouth, and opposite Matamoros, Mexico. It is historical as the scene of two engagements, the first being an unsuccessful attack by the Mexicans, in May, 1846; the second being the capture of the city by General Banks, in November, 1863. It contains a custom-house, has a trade with Mexico and by steamboat on the river. It is in the midst of a stock-raising district, and is the seat of St. Joseph's Roman Catholic College and Convent. Population 1890, 6,134.

BROWN UNIVERSITY, an educational institution dating back to colonial days, and one of the leading universities of the United States; first located at Warren, in Rhode Island, in 1764, under the title of Rhode Island College, it was removed to its present site at Providence four years later, taking its present name in honor of its principal benefactor, Nicholas Brown. The present administration of the university takes the form of a corporation, governed by 12 fellows and 36 trustees, a majority of whom must be Baptists. The buildings are 13 in number, and include a remarkable observatory and well-equipped gymnasium. The education, which is non-sectarian, is only for the sterner sex. Under the presidency of E. B. Andrews, 78 instructors are engaged in the tuition of an average of 850 students, most of whom are from the state, and nearly all from New England. The productive funds exceed



BROWN UNIVERSITY.

$1,200,000, and the total income of the university is over $190,000. Degrees in arts, physics, sciences and engineering are conferred.

BROWNVILLE, one of the oldest towns of Nebraska, county seat of Nemaha County. It is pleasantly situated on the Missouri River, about 120 miles, by water, below Omaha. It contains several mills and factories, and has a flourishing local and river trade. Population 1890, 980.

BROWNWOOD, a city of western central Texas, the county seat of Brown County. It is situated on the Pecan River, near the foot of the Comanche Mountain, about 75 miles N.W. of Lampasas. It is the seat of Howard Payne (Baptist) College and of Daniel Baker (Presbyterian) College. The surrounding country is rich in pasturage, and in the vicinity are valuable groves of timber. Population 1890, 2,176.

BROXBURN, a mining and manufacturing village of Scotland, situated on the Union canal, 12 miles W. of Edinburgh. It is chiefly notable for its shale-oil works. (See PARAFFIN, Vol. XVIII, p. 240.) Those of the Broxburn Oil Company, built in 1878, employ about 1,600 men, and turn out annually about 10,000,000 gallons of crude paraffin oil from the shale mined in the

neighborhood, besides paraffin candles and wax, sulphate of ammonia and other products. Population 1890, 3,210.

BROZIK, VACZLAV, a Bohemian painter of historical compositions; born at Pilsen, Bohemia, in 1852; a pupil of Piloty and Munkacsy, studied in Prague. He was made an officer of the Legion of Honor in 1890. His *Embassy of the King of Bohemia and Hungary at the Court of Charles VII, 1457*, obtained a medal of the second class in the Paris Salon of 1878. Among his other noted works may be mentioned *An Episode of the War of the Hussites in Bohemia in 1419* (Salon, 1877); *Columbus Before Ferdinand and Isabella* (in the Metropolitan Museum of Art, New York), and *The Defenestration of Prague, 1618* (exhibited at the World's Columbian Exposition). His pictures are dramatic in composition, fair in drawing and strong in color.

BRUCE, a Scottish noble family of Norman descent. See ROBERT, THE BRUCE, Vol. XX, p. 592; and also SCOTLAND, Vol. XX, p. 488.

BRUCE, ALEXANDER, a Scotch theologian and educator; born in Perthshire in 1831. He became professor of New Testament exegesis in the Free Church College at Glasgow in 1875. His literary works are chiefly theological. Among them may be mentioned *The Training of the Twelve Apostles; The Chief End of Revelation; The Parabolic Teaching of Christ;* and *Apologetics* (1892).

BRUCE, BLANCHE K., born in Prince Edward County, Virginia, March 1, 1841. He is an African, was born in slavery, and continued in servitude till the Civil War, when his young master enlisted in the Confederate army. Young Bruce had received some education from his master's tutor, and he taught school in Hannibal, Missouri, and then entered Oberlin College. After the war he became a Mississippi planter, and was elected to several county and state offices, and in 1875 was elected on the Republican ticket to the United States Senate. Since 1868 he has been a member of every Republican convention. In 1881 he was appointed by President Garfield to the office of Register of the Treasury. Senator Bruce is highly esteemed as a platform lecturer as well as a politician.

BRUCE, DAVID, king of Scotland, as David II. See SCOTLAND, Vol. XXI, p. 489.

BRUCE, GEORGE, type-founder; born in Edinburgh, Scotland, June 26, 1781; died in New York City, July 6, 1886. Coming to New York at the age of 14, he was apprenticed to a bookbinder, and, with his brother David, afterward drifted to Philadelphia, Albany, then back to New York. They had had some printing-house experience, and in 1806 opened a book-printing office. Three years later they were able to move to a better locality. In 1812 the secret of stereotyping was learned by David during a visit to England, and the brothers henceforth employed the process in their work, finding it necessary to cast their own type, and in various other ways overcome obstacles. The New Testament, in bourgeois (1814), was their first stereotyped work. In 1816 they abandoned the printing business and became exclusively type-founders, erecting in 1818, on Chambers Street, the present foundry. George Bruce introduced many improvements in types, and, assisted by his nephew David, his brother having retired from the business, invented the only successful type-casting machine. Mr. Bruce was connected with various industrial societies, and was noted for integrity and benevolence.

BRUCE, SIR GEORGE BARCLAY, an English civil engineer; born in Newcastle-on-Tyne in 1821; after a professional education under the care of Robert Stephenson, he held several railroad appointments; was resident engineer for the Royal Border bridge, chief engineer for the Madras and South Indian railways, and superintended the construction of railroads in Prussia, Spain, New Zealand and Spanish South America. He was twice elected president of the Institution of Civil Engineers and received the dignity of knighthood at the Queen's jubilee in 1887.

BRUCE, HENRY AUSTIN. See ABERDARE, LORD, in these Supplements.

BRUCE, JOHN COLLINGWOOD, English antiquary; born at Newcastle in 1805; graduated at Glasgow in 1826, and was trained for the Presbyterian ministry, but devoted himself to teaching. He was moderator of the English Presbyterian Church in 1881. His works include *The Roman Wall* (1851; 3d ed., 1866); *The Bayeux Tapestry Elucidated* (1856); *Lapidarium Septentrionale* (1875), an account of all the Roman monuments in the north of England; and a *Handbook to the Roman Wall* (1863). He died in 1892.

BRUCEA, a genus of *Rutaceæ*, named after J. Bruce (1730–94), the African explorer. *Brucea antidysenterica*, or *ferruginea*, is an Abyssinian shrub, the leaves of which are said to be tonic, astringent, and useful in dysentery. Those of *Brucea sumatrana* a native of the Indian Archipelago, China, etc., possess the same medicinal properties. They are intensely bitter, their properties resembling those of quassia. The Abyssinian species acquired a factitious importance in the beginning of the nineteenth century, from a mistaken belief that it produced the dangerous false Angostura bark, and in this belief the name *brucin* or *brucine* was given to an alkaloid really produced by *Strychnos Nux-vomica*.

BRUCITE, a mineral. See MINERALOGY, Vol. XVI, p. 388.

BRUCH, MAX, an eminent German composer; born at Cologne, Jan. 6, 1838. His father was a government official, while his mother came of a well-known and gifted musical family of the lower Rhine. Herself a distinguished singer, she tended the early development of her son's musical talents. After theoretical training at Bonn, he won the Mozart scholarship at Frankfort-on-the-Main, and continued his studies under Hiller, Reinecke and Breunnung at Cologne. He visited the old-time haunts of melody at Leipsic, Munich and a score of old German towns, and at Mannheim won his first wreath of bays by his setting of the poet Geibel's *Loreley*, originally written for Mendels-

sohn. In 1865 he was chosen as musical director at Coblenz, and from 1867 was for three years kapell-meister to the prince of Schwarzburg-Sondershausen. His most successful and important composition was his *Scenes from the Frithjof-Saga*, for male voices, which has been critically termed "a work of the freshest invention and consummate technique." His greatest success was in concert music and orchestra. Above all, a master of melody and of the effective treatment of the Masses.

BRUCINE ($C^{23}H^{26}N^2O^4+4H^2O$), a vegetable alkaloid, present in the seeds of *Strychnos Nux-vomica*, false Angostura bark, and St. Ignatius bean (seeds of the *Strychnos Ignatii*). Brucine is almost insoluble in water, but dissolves readily in alcohol, and very slightly in ether. See POISONS, Vol. XIX, p. 279.

BRÜCKNER, ALEXANDER, a German historian; born in St. Petersburg, Russia, Aug. 5, 1834, and passed his early years in commercial pursuits. Then he commenced his advanced studies at the universities of Jena and Berlin; was appointed professor of history in the Imperial Russian School of Law, whence he proceeded in similar positions to Odessa and Dorpat. His works, all published in German, were numerous and valuable. Among them are *Studies on Financial History* (1867); *Studies on the History of Civilization* (1878); *History of the Russo-Swedish War of 1788* (1869); and numerous contributions to periodical literature.

BRUGG, a small town in the Swiss canton of Aargau, situated on the right bank of the Aare, 36 miles S.E. of Basel by rail. On account of the number of theologians who sprang from Brugg in Reformation days, it was termed the "Town of the Prophets." Near it is the site of Vindonissa, the chief Roman station in Helvetia; and it was also the cradle of the House of Hapsburg, whose ruined castle, founded in 1020, crowns a wooded height two miles from the village. Nearer is the abbey of Königsfelden (1310; converted in 1872 into an asylum), in the vaults beneath which are interred many of the members of the Austrian royal family. Zimmermann was a native of Brugg. Population 1890, 1,435.

BRUGMANN, FRIEDRICH KARL, a German philologist; born at Wiesbaden, May 16, 1849; educated at the universities of Halle and Leipsic, in which latter he became professor of Sanskrit and comparative philology in 1882. His researches and publications in the field of Indo-European vocalism have done more for the study of philology than had been accomplished for ages. His writings, while scientific and forceful, have the singular advantage of attractive and clear diction. His *Morphological Researches in the Domain of Indo-Germanic Languages* (4 vols., 1881) and *Present Condition of Linguistic Science* (1882) are among the standard works from his pen.

BRUGSCH, HEINRICH KARL, an eminent Egyptologist; born at Berlin, Feb. 18, 1827. At the age of 21 he published a Latin treatise on the demotic writing, which gained him the favor of King Frederick William IV, by whose aid he was enabled to visit the museums of Paris, London, Turin and Leyden. He visited Egypt in 1853, taking part in the excavations of the French archæologist, Mariette, at Memphis. He was called to the chair of Oriental languages at Göttingen, but returned to Egypt in 1870, on the invitation of the viceroy, to take charge of the School of Egyptology at Cairo, with the rank of Bey, receiving the title of Pasha from the viceroy in 1881. In 1884 he accompanied the German embassy to Persia. Brugsch's works on Egyptology are numerous and valuable. Of these the chief are *Geographische Inschriften Altägyptischer Denkmäler* (3 vols., 1857–60); *Geschichte Egyptens unter den Pharaonen* (1877; English translation, 1879); *Hieroglyphisch-Demotisches Wörterbuch* (7 vols., 1867–82); *Grammaire Hieroglyphique à l'Usage des Étudiants* (1872); *Dictionnaire Géographique de l'Ancienne Egypte* (1877–80); *Thesaurus Inscriptionum Ægypticarum* (1882); *Religion und Mythologie der alten Egypter* (1884). He died Sept. 10, 1894.

BRÜHL, a town of Rhenish Prussia, eight miles S.S.W. of Cologne by rail. It has a fine castle, erected in the early part of the eighteenth century by the Elector Clement Augustus of Bavaria, and restored by the king of Prussia in 1842. After his banishment from France in 1651, Cardinal Mazarin took up his residence in Brühl. Population 1890, 4,030.

BRÜHL, HEINRICH, COUNT VON, prime minister of Augustus III, king of Poland and elector of Saxony, memorable among unworthy ministers and venal statesmen; born at Weissenfels, Prussia, Aug. 13, 1700; died at Dresden, Oct. 28, 1763. In early life he entered as a page into the service of the duchess of Saxe-Weissenfels. His winning address and tact gained for him rapid promotion through several offices of state, until in 1746 he became prime minister to Augustus III (see SAXONY, Vol. XXI, p. 355). While humoring the whims of his unworthy master he contrived to enrich himself and to accumulate honors and titles, maintaining the most splendid establishment in the kingdom. The effect of this robbery of the national finances was felt at the outbreak of the Seven Years' War, when the country could furnish only 17,000 men to oppose Frederick of Prussia, who surprised and captured the whole Saxon army in its camp at Pirna. Augustus and Brühl fled to Warsaw, returning to Dresden when peace was concluded.

BRUMAIRE (French, "foggy month"), a division of the year, in the republican calendar of France. It includes the time from October 22d to November 20th. The celebrated 18th Brumaire, which witnessed the overthrow of the Directory and the establishment of the sway of Napoleon, corresponds with Nov. 9, 1799, of the Gregorian calendar.

BRUMMELL, GEORGE BRYAN, better known as "Beau Brummell," born in London, June 7, 1778, the son of Lord North's private secretary. At Eton, and during a brief sojourn at Oxford, he was less distinguished for studiousness than

for the exquisiteness of his dress and manners, and, after four years in the army, having come into a fortune of £30,000, he entered society as a leader of fashion, in which vocation he proved a brilliant success. His wit proved too fine for his 20 years' patron and admirer, the Prince Regent, resulting in a quarrel in 1813. Three years later, Brummell was forced by gambling debts to flee to Calais, where he continued his reckless course for 14 years. From 1830 to 1832 he held a sinecure consulate at Caen. He subsequently became imbecile, and died in the pauper lunatic asylum of that city, March 29, 1840.

BRUNANBURH, the scene, in 937, of a bloody battle, in which Athelstan defeated an allied army of Welsh, Scots and Danes (see SCOTLAND, Vol. XXI, p. 479). The exact location of the place is not known. Of the Anglo-Saxon poem on the victory, preserved in the "Anglo-Saxon Chronicle," there is a spirited version by Lord Tennyson.

BRUNE, GUILLAUME MARIE ANNE, a French marshal of the First Empire; born at Brives-la-Gaillarde, Corrèze, France, March 13, 1763. At first a Paris bookseller, he became a member of the Cordeliers' Club and a friend of Danton. In 1792 he was sent as civil commissary to Belgium, but he soon entered the army, fought in the Vendéean War and in Italy under Masséna, and after Rivoli was made general of division. Sent by the Directory to Switzerland in 1798, he executed his orders with brilliant success (see SWITZERLAND, Vol. XXII, p. 793). In 1799 he was made commander of the army of Holland, where he achieved the reputation of being one of the best generals of his age. In 1803 he was ambassador to Turkey, and in 1804 obtained the baton of marshal. He became governor-general of the Hanseatic towns, but was recalled by Napoleon. After the return from Elba, he joined the Emperor and was made a peer. He was murdered by a mob at Avignon, Aug. 2, 1815.

BRUNEHAUT OR BRUNEHILDE, a queen of Austrasia, daughter of Athanagild, king of the Visigoths. She married Sigebert, king of Austrasia, in 561. Him she persuaded to make war on his brother, Chilpéri, king of Neustria, who had murdered his wife, Galsuinda, sister of Brunehaut, in order to espouse his mistress, Fredegonda. Sigebert was murdered in 575 by Fredegonda, and Brunehaut became regent for her minor son, Childebert. She was captured at the age of 80, after many reverses of fortune, by Clothaire II, who caused her to be dragged to death by a wild horse. (See also FRANCE, Vol. IX, p. 530.) In the *Nibelungenlied* (q.v., Vol. XVII, p. 474) the name is also borne by a legendary queen of Isalaland, in the Low Countries, the wife of King Gunther, for whom she is won by Siegfried. In the old Norse version of the Siegfried legend, Brunhild is a valkyr who is won by Sigurd for Gunnar.

BRUNEI, otherwise known as "Borneo Proper," is a sultanate in the northwestern part of Borneo. Area, about 3,000 square miles. Population, about 50,000. Capital, Brunei. A virtual protectorate was proclaimed over Brunei by England in 1888, the internal administration being left to the sultan, but all foreign relations conducted by the British resident agent. See BORNEO, Vol. IV, p. 590.

BRUNETIÈRE, FERDINAND, a French editor and critic; born in Toulon, July 19, 1849; educated in Marseilles and Paris, he joined the staff of the *Revue des Deux Mondes* in 1875; was lecturer at the Normal School in 1886, and the following year was chosen a member of the Legion of Honor. In 1893 he was elected one of the Forty Immortals of the French Academy, and in 1895 was editor-in-chief of the *Revue des Deux Mondes*. His works include *Critical Studies of the History of French Literature* (1880–93); *The Naturalistic Romance* (1883); *History and Literature* (1884–86); *Problems of Criticism* (1890). Several of these works have been crowned by the French Academy. In addition to these, M. Brunetière has edited many works for educational purposes.

BRUNIG, a Swiss pass (3,295 feet), forming the shortest and easiest route between the "Forest Cantons" and the Bernese Oberland, and connecting Lucerne with Meiringen. A road was formed in 1857–62, and in 1889 a Brunig branch of the Berne-Lucerne railway was opened, traversing the pass.

BRUNI ISLAND, an island off the east coast of Tasmania, from which it is separated by D'Entrecasteaux Channel. It has a length of 32 miles, a varying breadth of 1 to 11 miles, and an area of 160 square miles. Coal is mined here.

BRUNLEES, SIR JAMES, a celebrated English civil engineer; born at Kelso, in Scotland, in 1816; educated there and at Edinburgh University; in 1838 became assistant engineer on the Bolton and Preston railway. He was associated with Sir John Hawkshaw in the construction of the Lancashire and Yorkshire railway; built the Londonderry and Coleraine, Ulverston and Lancaster, and many other English roads; superintended several extensive dock-constructions, and was one of the engineers for the projected channel tunnel. He also constructed several railroads in Brazil and other republics of South America. He received the honor of knighthood in 1886; wrote several papers on professional subjects; and died June 2, 1892.

BRUNN, HEINRICH, a German archæologist; born in Wörlitz, in Anhalt, Germany, Jan. 23, 1822; studied under Ritschl and Welcker; was appointed professor of archæology in Munich University in 1865; his works include *Geschichte der Griechischen Künstler* (1853–59) and *I Rilievi delle Urne Etrusche* (1870).

BRÜNNOW, FRANZ FRIEDRICH ERNST, a German astronomer; born in Berlin, Nov. 18, 1821; educated in the University of Berlin, where, in 1843, he obtained the degree of Ph.D.; four years later he became director of the Düsseldorf Observatory. In 1851 he went to Berlin as assistant to Encke, whence, in 1854, he removed to become

professor of astronomy and director of the observatory at Ann Arbor, Michigan; while there he published *Spherical Astronomy* and *Tables of Victoria*, the former gaining sufficient credit to be translated into German, French, Italian, Spanish and Russian. In 1866 he was called to Trinity College, Dublin, where he became astronomer royal of Ireland. His sight failing, he spent some time in Switzerland and southern France, dividing his last years between the scholastic quiet of Oxford and the scenic beauty of Heidelberg, where he died, Aug. 20, 1891.

BRUNNOW, PHILIPP, COUNT VON, diplomatist; born at Dresden, Aug. 31, 1797, and entered the Russian service in 1818. Sent on a special mission to London in 1839, he was accredited as permanent ambassador there in the following spring. In this capacity he soon acquired distinction as a diplomatist. On the outbreak of the war in 1854 he retired from London, and represented Russia at Frankfort. He was afterward appointed to the court of Prussia, but in 1858 he returned to his old place in London, where he represented Russia at the conferences in 1864 and 1871. He was raised to the rank of count in 1871, and in 1874 retired to Darmstadt, where he died, April 12, 1875.

BRUNO THE GREAT, archbishop of Cologne; one of the most eminent men of his time; born about 925; died at Rheims, France, Oct. 11, 965. He was the third son of Henry the Fowler. He became archbishop of Cologne and chancellor of the empire under his brother Otto I, and afterward, as a reward for his service, duke of Lorraine. Distinguished alike for piety and learning, he strove to reform the monasteries and advance the love of learning among the clergy.

BRUNSWICK, a duchy of the German Empire. Area, 1,424 square miles; population 1890, 403,773. Brunswick, the capital of the duchy, had a population of 120,000 in 1895. For early history and institutions, see BRUNSWICK, Vol. III, pp. 401–403.

The budget is voted by the Chamber for the period of two years, but each year separately. For the year from April 1, 1895, to April 1, 1896, the revenue of the state was fixed at 13,190,000 marks and the expenditure at 14,171,000 marks. Not included in the budget estimates is the civil list of the duke — 1,125,000 marks in 1895. The public debt of the duchy, without regard to a premium loan, repayable in rates of 1,219,740 marks yearly till 1924, at the commencement of 1895 was 28,396,288 marks, four fifths of which were contracted for the establishment of railways. The productive capital of the state was at the same time 42,490,000 marks, besides an annuity of 2,625,000 marks till 1934, stipulated at the sale of the railways of the state. In 1895 there were 280 miles of railway.

The last duke of Brunswick, Wilhelm I (born April 25, 1806; crowned April 25, 1831), died Oct. 18, 1884. With him the ducal house of Brunswick became extinct, his son, Duke Charles, having died in 1873 without issue.

The heir to Brunswick, the Duke of Cumberland, was excluded, owing to his refusal to give up claim to the throne of Hanover. The Duke of Cambridge (cousin to Queen Victoria, and late commander-in-chief of the British army), the nearer agnate heir, was also not accepted, owing to his refusal to give up his English appointments and residence.

The Brunswick regency law of Feb. 16, 1879, enacts that in case the legitimate heir to the Brunswick throne be absent or prevented from assuming the government, a council of regency, consisting of the ministers of state and the presidents of the Landtag and of the supreme court, shall carry on the government, while the German Emperor shall assume command of the military forces in the duchy. If the rightful heir, after the space of a year, is unable to claim the throne, the Brunswick Landtag shall elect a regent from the non-reigning members of German reigning families.

Under this provision of the constitution, Prince Albrecht, son of the late Prince Albrecht of Prussia, brother of William I, emperor of Germany, was unanimously elected regent of Brunswick by the Diet, Oct. 21, 1885. The Prince is second cousin to the present emperor, William II. He was born May 8, 1837, and married, April 19, 1873, to Princess Maria, daughter of Duke Ernst of Saxe-Altenburg. When chosen regent he was commanding-general of the Tenth Corps d'Armée.

BRUNSWICK, a city of southeastern Georgia, county seat of Glynn County. It is situated on St. Simon's Sound, about 80 miles S.S.W. of Savannah and 12 miles from the Atlantic Ocean. The harbor is safe and commodious, and the chief industry is the manufacture and export of yellow pine lumber and cypress staves. There is also a considerable trade in naval stores and cotton. There are two lines of railroad, the same number of steamboat lines to New York and several large saw-mills. Population 1890, 8,459.

BRUNSWICK BLACK, a varnish employed for coating over coarsely finished iron grates, fenders, etc. It is prepared by melting together asphalt, linseed-oil and turpentine. For finer work it has been superseded by Berlin black, a similar composition of finer quality.

BRUNSWICK GREEN, a pigment used in oil-painting, obtained from sulphate of copper, white oxid of arsenic, potash and acetous acid. Ordinary Brunswick green is nothing more than a mixture of chromate of lead and Prussian blue, and is by no means permanent.

BRUSH, CHARLES FRANCIS, an American inventor, born in Euclid, Ohio, March 17, 1849. His early years were spent on a farm, and he attended the Cleveland public schools. Physics, chemistry and engineering were favorite studies, and his leisure was spent in scientific experiments. He graduated at the University of Michigan in 1869, and became analytical chemist in a laboratory of his own, established in Cleveland. In 1875 he built a dynamo machine which could supply several lamps in one circuit with the right

kind and amount of electricity. His next important invention was an electric lamp. In 1876 these inventions were successfully introduced in the United States, and since then he has obtained half a hundred patents, many of which were highly remunerative.

BRUSH, GEORGE JARVIS, an American mineralogist; born in Brooklyn, New York, Dec. 15, 1831; educated at Yale, at the University of Munich, at Freiberg and at the London School of Mines. In 1851 he was assistant professor of chemistry in Louisville University, and from 1852 to 1853 performed the same work in the University of Virginia. In 1857 became professor of mineralogy in Yale. He has for years been prominent in the management of the Sheffield Scientific School of Yale. Professor Brush assisted Prof. J. D. Dana in preparing a *Descriptive Mineralogy*, and has himself published a *Manual of Determinative Mineralogy*. He is a contributor to several journals, and a member of various scientific societies.

BRUSH-TURKEY OR NEW HOLLAND VULTURE (*Talegallus lathami*), a bird of the family *Megapodiidæ*. See MEGAPODE, Vol. XV, p. 827.

BRUSSELS CONFERENCE, the name given to a concourse of delegates from the principal military powers which met at Brussels, July 27, 1874. Russia (the prime moving power in calling the conference), Germany, Great Britain, France, Austria, the Netherlands, Belgium, Italy, Spain, Denmark, Sweden, Norway, Greece and Switzerland were represented by delegates. The United States alleged lateness of invitation as a reason for not being present. While the conference was devoid of tangible result, it was of considerable utility in the discussion it provoked. For some of the questions debated, see INTERNATIONAL LAW, Vol. XIII, p. 195.

BRUSSELS INTERNATIONAL TREATY. In the summer of 1890, representatives of England, Germany, France, Italy, Portugal and the United States agreed upon a treaty for the suppression of the slave trade in the Central African territory. This treaty was unanimously approved by the United States Senate, Jan. 11, 1892. As passed, the treaty includes a clause substantially declaring that the United States has no desire to take any part in the establishing of territorial boundaries, or in the division of political power among the European powers now holding territory in Africa. An *ad valorem* duty of not more than ten per cent will be levied by the Congo State upon products imported from the United States, the proceeds to be used in suppressing the slave trade.

BRUSSELS SPROUTS, a species of cabbage in which a series of small heads are formed about the stem. See HORTICULTURE, Vol. XII, p. 279.

BRYAN, a village of extreme northwestern Ohio, county seat of Williams County, about 53 miles W.S.W. of Toledo, on the Lake Shore and Michigan Southern and Cincinnati, Jackson and Mackinaw railroads. It is noted for its artesian wells. It is the seat of an academy, and contains carriage and wheel-barrow factories and a foundry. It is in the midst of a potato and grain producing district. Population 1890, 3,068.

BRYAN, a city of southeastern central Texas, county seat of Brazos County. It is situated about five miles E. of the Brazos River, and 112 miles N.E. of Austin. It is the seat of two colleges, including the State Agricultural and Mechanical College at College Station, five miles distant, and of two academies. It is an important shipping-point for cotton, and contains extensive planing-mills. Population 1890, 2,979.

BRYAN, WILLIAM JENNINGS, an American public man, was born in Salem, Marion County, Illinois, March 19, 1860. His father, Silas L. Bryan, was a lawyer of standing, who had served eight years in the Illinois senate and afterward 12 years as a circuit judge. His son was educated at Whipple Academy at Jacksonville, Illinois College in the same place, and Union Law College at Chicago. After graduation, he practiced law at Jacksonville until 1887, when he removed to Lincoln, Nebraska, and became a member of the law firm of Talbot and Bryan. He speedily entered the political arena, and in the campaign of 1888 stumped the first district of Nebraska for J. Sterling Morton, nominee for Congress. The same year he declined a nomination for lieutenant-governor. On July 30, 1890, he was nominated for Congress and wrote the platform on which he ran. Later on he was to figure more largely in the public eye, and for a higher office, though even then circumstances were not in his favor. Meantime, he pursued his canvass of the district on the tariff issue and won fame as a political orator throughout the state. In 1890 he was elected to Congress in the first Nebraska district, over W. J. Connell of Omaha, and was re-elected in 1892 over Allen W. Field of Lincoln.



WILLIAM J. BRYAN.

In 1894 Mr. Bryan declined a third nomination and was nominated by the Democratic state convention for United States Senator by the unanimous vote of the convention. He polled 80,000 votes. The Republicans, however, had a majority in the legislature, and Bryan was defeated for the Senatorship. After Mr. Bryan's Congressional term expired he devoted his time exclusively to spreading the doctrine of free silver. Attending the Democratic convention at Chicago in July, 1896, he was called on for a speech. He responded in an electric and perfervid oration. It carried the convention, and the following day Bryan was nominated as the Democratic candidate for President. Idealized by his admirers as "The Boy Orator of the Platte," his opponents have charged him with plagiarism in respect of his Chicago speech. The Populists indorsed him

as their candidate at the St. Louis convention, but tacked on T. E. Watson of Georgia as their Vice-Presidential candidate, instead of Arthur Sewall of Maine. Mr. Bryan, notified of his nomination in New York, with unprecedented vigor made a personal campaign, addressing a dozen audiences daily in various parts of the country, but was defeated in the November elections.

BRYANITES OR BIBLE CHRISTIANS. See METHODISM, Vol. XVI, p. 192.

BRYANT, WILLIAM CULLEN, a poet of nature, was born in Cummington, Massachusetts, Nov. 3, 1794. His earliest poetic efforts date from his eighth year. One, on the advance of knowledge, was published in the *Hampshire Gazette* in 1805. In his thirteenth year he wrote a satire on President Jefferson's embargo on American shipping, published under the title of *The Embargo; or, Sketches of the Times* (Boston, 1808). He studied at New Brookfield and Plainfield, Massachusetts and at Williams College, but left school to begin the study of law. At this period, Bryant being in his eighteenth year, his best poem, *Thanatopsis*, was written, and was found by his father after he had left Cummington to begin his law studies. It was first published in the *North American Review* (September, 1817). Admitted to the bar in Plymouth, he practiced in Plainfield, near Cummington, and moved to Great Barrington, in Berkshire, where he met Miss Frances Fairchild, whom he married in 1821. In 1825 he abandoned the legal profession, went to New York and assumed the editorship of the New York *Review*, afterward merged into the New York *Literary Gazette*. This again became the *United States Literary Gazette*, and afterward the *United States Review*. In the mean time Mr. Bryant had taken a temporary place on the staff of the *Evening Post* of New York, and was also associated with Robert C. Sands and G. C. Verplanck in the editorship of an annual called *The Talisman*. On the death of William Coleman, the proprietor of the *Evening Post*, in 1829, Mr. Bryant became editor-in-chief and part proprietor of that journal. His sympathy was with the Democratic party, and his support of General Jackson during the National Bank warfare affected the prosperity of his paper. In 1834 he went to Europe, but was speedily recalled, owing to the illness of his assistant, Mr. William Leggett, and the losing fortunes of the *Evening Post*. He opposed the annexation of Texas and the war with Mexico, aided in founding the Free Soil party in 1848, and in 1856 took an active part in the formation of the Republican party. In 1860 he was a Presidential elector of Abraham Lincoln. During the war he supported the cause of the Union and was an advocate of the emancipation of the slaves. He contributed several series of letters to his newspaper on his travels; visited Cuba three times; Europe, six times, once including a trip to the East; and traveled widely through this country. These letters were published as *Letters of a Traveler* (New York, 1850). Mr. Bryant possessed facility of speech and delivered many public addresses. He spoke at the banquet to Kossuth in 1851; at the Burns Centennial in 1859; at the Schiller festivities in 1859; at those of Goethe in 1875; and at the dedication, in Central Park, New York, of the statue of Morse (1871), of Shakespeare (1872), Scott (1872), and Halleck (1874). These *Orations and Addresses* were published in book-form (1873). In 1870 and 1872 he published translations of the *Iliad* and *Odyssey*. His last public address was delivered on May 28, 1878, at the unveiling of the statue of Mazzini in Central Park, where he was overcome by heat and injured by a fall, from which he never recovered. He died in New York City, June 12, 1878, and was buried at his country seat in Roslyn, Long Island. His biography, written by Parke Godwin, his son-in-law, is ample and complete, while a later one by his editorial associate, John Bigelow, is less extended, but more entertaining. Bryant was essentially a poet of nature, his verse overflowing with what Wordsworth terms "religion of the woods." A violet became in his hands a gem fit to be placed in an imperial diadem; a mountain only served to lead his eyes to the canopy above it. His prose was finished with an exquisite grace, and that without any appearance of labor. His only fault is, that he wrote so little, and shone in a series of little stars, instead of concentrating talents far beyond the average in one, and that an immortal bid for fame. A cold-drawn critique of his earlier work, from the pen of a cautious and unpoetic Scot, is to be found in AMERICAN LITERATURE, Vol. I, p. 732.



WILLIAM C. BRYANT.

BRYCE, GEORGE, a Canadian clergyman and educator; born at Mount Pleasant, Brant County, Ontario, April 22, 1844. He was educated at Toronto University and Knox College, and on his ordination was chosen as assistant in Chalmers's Church, Quebec. His forte was in the line of missionary endeavor, and at the instance of the Presbyterian General Assembly he organized an educational institution on the Red River and founded a church at Winnipeg, in Manitoba. He was mainly instrumental in founding the University of Manitoba in 1871, and has since that date been inspector of schools, examiner in natural science in Manitoba University and moderator of his church synod. His writings concern the scene of his labors; among them are *Manitoba* (1882); *Canada and the Northwest* (1887); and *A Short History of the Canadian People* (1886).

BRYCE, JAMES, an English author and statesman; born at Belfast, Ireland, in 1838, and educated at Glasgow and Oxford. In 1870 he became regius professor of civil law at Oxford University. He has been a member of Parliament since 1880, and was Under-Secretary for Foreign Affairs in 1886. He is a representative Liberal,

and is noted for his study of the "Eastern question" and his deep interest in the condition of the Armenians. Mr. Bryce's first book was *The Holy Roman Empire*, which established his literary reputation. Among his other works are *Transcaucasia and Ararat* and various contributions to magazines. He is best known in America by *The American Commonwealth*, published in 1889, the result of 20 years' study of the country and its institutions, and remarkable as a candid and liberal criticism and consideration of the faults and advantages of American constitution and life. In 1892 Mr. Bryce was a member of Mr. Gladstone's fourth cabinet.



JAMES BRYCE.

BRYENNIOS, PHILOTHEOS, a Greek theologian, metropolitan of Nicomedia; born at Constantinople in 1833; studied at the theological school in Chalce, near Byzantium, and after being ordained deacon, attended lectures at Leipsic, Berlin and Munich (1856–61). He was for some years a teacher at Chalce, and presided over the Greek school in Constantinople from 1867 to 1874. He was one of two representatives of the Greek Church at the Old Catholic conference in Bonn in 1875, and while absent there was chosen metropolitan of Serræ, in Macedonia. In 1877 he was translated to Nicomedia. Author of several minor works, Bryennios is chiefly known as the editor of the Epistles of Clement and of the *Teaching of the Apostles* (*Διδαχή τῶν Ἀποστόλων*).

BRYENNIUS, NICEPHORUS. See BYZANTINE HISTORIANS, Vol. IV, p. 613,

BRYN-MAWR COLLEGE, a noted educational institution for women, founded in 1880 by Dr. J. W. Taylor, a philanthropic member of the Society of Friends, for the purpose of affording the highest opportunities for culture to women of refinement and intelligence. It is situate at Bryn-Mawr, on the line of the Pennsylvania railroad, 10 miles W. of Philadelphia, where the college buildings are surrounded by 42 acres of land included in Dr. Taylor's original donation. The distinctive feature of Bryn-Mawr is the high standard required for admission. Its system of study combines courses for general culture with varied elective subjects, while nine fellowships of $525 each enable distinguished graduates in Greek Latin, English, German, Romance languages, history, chemistry, mathematics and biology to pursue higher studies in their special subjects. A special traveling fellowship is designed to admit one graduate yearly to any chosen European university. The college is non-sectarian, has 30 instructors, and an average of 285 students under the presidency of M. Carey Thomas, LL.D. Its funds exceed $1,000,000, of which some $16,000 is from recent benefactions.



BRYN-MAWR COLLEGE.

BRYONY OR BRIONY, the common name of species of *Bryonia*, a genus of *Cucurbitaceæ*, of which the common bryony (*Bryonia dioica*) and *Bryonia alba* are both natives of Europe. The former is frequent in the hedge-rows in England, but becomes rarer in the north, and is not indigenous in Scotland. It has cordate palmate leaves, axillary bunches of flowers, and red berries about the size of a pea. *Bryonia alba*, which is monœcious, with black berries, is common in central Europe. The root of both varieties is applied to bruises; was formerly in use as a purgative, and its tincture is still employed in homœopathic and veterinary practice. The roots of bastard bryony, *Vitis* (*Cissus*) *sicyoides*, are also acrid and purgative, and are used medicinally in the West Indies; but it is said that the root of *Bryonia abyssinica*, when cooked, is eaten without danger. Black bryony, *Tamus communis*, is a plant of a different family (*Dioscoreaceæ*). In habit and distribution it is similar to bryony proper, but it may be readily distinguished by its simple, entire, heart-shaped leaves, which are smooth and somewhat glossy. See YAM, Vol. XXIV, p. 727.

BRYOPHYLLUM, a genus of *Crassulaceæ*. *Bryophyllum calycinum*, a succulent, somewhat shrubby plant, native of the Moluccas, with oblong, crenulated leaves, and large, drooping panicles of greenish yellow flowers, is not infrequent in northern hothouses, being regarded as an object of interest on account of its producing buds on the edges of the leaves more readily than almost any other plant.

BRYOPHYTES, one of the four great divisions of the plant kingdom, including the mosses and their allies. They are popularly distinguished from the *Pteridophytes* (ferns and their allies) and *Spermaphytes* (flowering plants or seed-plants), above them, by developing no woody system; and from the *Thallophytes*, below them, by usually showing a differentiation of stem and leaves, but better by the presence of the characteristic female organ known as the *archegonium* (which see). Bryophytes display a distinct "alternation of generations" (which see), the gametophyte being represented by the leafy plant, the sporophyte by the *sporogonium*, that is, the spore-case with its stalk (*seta*). The sporophyte remains in connection with the gametophyte, chiefly for mechani-

cal support, but absorbing more or less food-supply from it. Bryophytes are easily subdivided into two great groups, *Hepaticæ* (liverworts) and *Musci* (mosses), the former having usually a horizontal axis and a thalloid body, and the latter a vertical axis and a leafy body. See CLASSIFICATION and MORPHOLOGY, in these Supplements. J. M. C.

BRYOZOA. See POLYZOA, Vol. XIX, pp. 429 et seq.

BRYUM, a large and important genus of mosses giving their generic name to the formation of family and larger group names, as well as to the great division, Bryophytes. The genus is a member of the *Acrocarpæ;* that is, those true mosses whose archegonia (and hence capsules) are borne terminally upon the main shoots.

BUACHE, PHILIPPE, a French geographer; born in 1700; became, in 1729, royal geographer, and in 1730 a member of the Academy of Sciences; died in 1773. He published atlases and geographical works. His nephew, JEAN NICHOLAS BUACHE (1741–1821), was also a celebrated geographer.

BUAZE, the fiber of an asclepiadaceous shrub found by Livingstone north of the Zambesi. The twigs are employed as a source of the fiber, which much resembles flax.

BUBALIS, a genus of bovine animals (*Bovidæ*), which includes the buffaloes of Africa and India. It is used in the Indies as a beast of burden. The African cape buffalo (*B. caffer*) was formerly abundant, but is now rapidly disappearing.

BUBONIC PLAGUE. See PLAGUE, Vol. XIX, p. 159.

BUCCINATOR (Latin, from *buccanare*, "to sound a trumpet"), the trumpeter's muscle; a flat muscle forming the wall of the cheek; so called because, when the cheeks are distended with air, the contraction of this muscle forces it out, thus assisting in blowing wind-instruments.

BUCCINUM, a genus of gasteropod mollusks now restricted to the whelks. These shells are mostly found in northern seas. In England large quantities of whelks are used as food.

BUCENTAUR, the name of the state galley in which the doges of Venice used to sail out annually on Ascension day, amid great festivities, to perform the ceremonial marriage of the state with the Adriatic, in token of perpetual sovereignty. The ceremony was already in use in the thirteenth century; in 1798 the last "bucentaur," built in 1722 to 1729, was burned by the French, but some portions, spared for their gold-work, are still preserved in the arsenal. The word signifies a mythical monster, half-bull, half-man, such as may originally have been depicted on the vessel.

BUCEPHALUS (Greek, "ox-head"), the name of the favorite charger of Alexander the Great. (See ALEXANDER, Vol. I, p. 484.) Probably, also, the name of a peculiar breed of horses in Thessaly. The young hero was the first to break in the steed, and thus fulfilled the condition stated by an oracle as necessary for gaining the crown of Macedon.

BUCEROTIDÆ, a family of *Picariæ*. See HORNBILL, Vol. XII, p. 169.

BUCHAN, a district of Scotland, included in the present Aberdeenshire. See ABERDEENSHIRE, Vol. I, p. 43.

BUCHAN, DAVID, arctic explorer; born in 1780; held a lieutenant's commission in the British navy in 1806, and in 1810 was in command of a schooner on the Newfoundland station. He explored the river Exploit (1811), and penetrated 160 miles into the interior. Promoted commander in 1816, he was, two years later, appointed to the command of a polar expedition, at the same time that Ross and Parry started on their voyage in search of a northwest passage. Buchan reached Spitzbergen with the *Dorothea* and *Trent* (see POLAR REGIONS, Vol. XIX, p. 319), but all attempts to pierce the gigantic icy barrier were in vain. On his return he commanded for a time on the Newfoundland station, was appointed high sheriff in 1825, and a few years later sailed on another voyage to northern waters, from which he never returned. His name was removed from the list of living captains in 1839.

BUCHAN, PETER, collector of Scottish ballads; born at Peterhead, Scotland, in 1790; died in London, Sept. 19, 1854. At 24 he published a volume of original verse. He taught himself copper-engraving, learned the art of printing at Stirling, and set up a press at Peterhead in 1816. He afterward removed to London, but returned after two years to Peterhead. Buchan's *Ancient Ballads and Songs of the North of Scotland* was published at Edinburgh in 1828. A second collection was edited for the Percy Society, in 1845, by J. H. Dixon. Buchan was the author of a number of books; among them *Annals of Peterhead* (1819) and *The Eglinton Tournament and Gentlemen Unmasked* (Glasgow, 1839).

BUCHAN, WILLIAM, physician; born in 1729, at Ancrum, Roxburghshire, Scotland; died in London, Feb. 25, 1805. He studied divinity and medicine in Edinburgh, where he subsequently practiced, and lectured on natural philosophy. His *Domestic Medicine* appeared in 1769. Its success was great and immediate—19 large editions, amounting to 80,000 copies, being sold during his lifetime. Other of his works were *Cold Bathing* (1786); *Diet* (1797); and *Offices and Duties of a Mother* (1800). He removed to London in 1778, where he died, and was buried in Westminster Abbey.

BUCHANAN, a town of northwestern Georgia, county seat of Haralson County. It is situated on the Central Railroad of Georgia, about 50 miles W. of Atlanta, and in the midst of an agricultural region. Population 1890, 324.

BUCHANAN, a village of Berrien County, in the extreme southwest of the state of Michigan, is situated on the St. Joseph River, about 10 miles S. of Berrien Springs and on the Michigan Central railroad. It contains several flour and lumber mills, furniture factories, carriage and wagon works, and is the trade center of an extensive farming and fruit-growing region. Population 1890, 1,994.

BUCHANAN, CLAUDIUS, born at Cambuslang,

near Glasgow, Scotland, March 12, 1766; studied for two years at Glasgow University, and at the University of Cambridge (1791–95). In 1797 he became chaplain in the East Indian Company's service at Barrackpur, where he studied Hindustani and Persian; in 1799 he removed to Calcutta, and became vice-provost of the college founded by Lord Wellesley at Fort William. He translated the Gospels into Persian and Hindustani, and traveled through southern and western India, but was debarred as a chaplain from directly engaging in missionary work. He returned to England in 1808, where he succeeded, through his sermons and his periodical, *The Star of the East*, in exciting such interest as to secure the appointment of an English bishop to Calcutta. His *Christian Researches in India* was published in 1858. He died at Broxbourne, Hertfordshire, Feb. 9, 1815.

BUCHANAN, Franklin, an American naval officer; born in Baltimore, Maryland, Sept. 18, 1800; entered the United States navy in 1815, rising to the rank of captain in 1855. He joined the Confederate navy in 1861, and commanded the *Merrimac* in the conflict with the United States steamers *Congress* and *Cumberland*. He was wounded and unable to command in the subsequent encounter with the *Monitor*. Promoted to the rank of admiral, he surrendered the ironclad *Tennessee* to Admiral Farragut in Mobile Bay, Aug. 5, 1864, when he was severely wounded and lost a leg. He was president of the Maryland Agricultural College for some period after the war. He died in Talbot County, Maryland, May 11, 1874.

BUCHANAN, Joseph Rodes, physician, teacher and author, was born in Frankfort, Kentucky, Dec. 11, 1814. A graduate of the medical department of Louisville University in 1842, he practiced medicine in Cincinnati, and in 1846 became professor of physiology at the Eclectic Medical Institute in Cincinnati, where he remained for 10 years, the last five years as dean of the faculty. While there he established a reputation for his advanced theories on the action of the brain, and published *Buchanan's Journal of Man*. He published *System of Anthropology* and *Eclectic Practice of Medicine and Surgery*. In 1856 he went to New York, and for many years lectured and taught in the medical schools of New York City and of Boston, afterward removing to San José, California. In 1882 he published *The New Education*, and in 1884 *Therapeutic Sarcognomy*, in which he sought to develop a science of the correspondence and sympathy between the entire surface of the body and the entire surface of the brain, and to explain the psychical as well as physiological powers of each. His *Manual of Psychometry* (1885) followed similar lines. Professor Buchanan wrote many articles on his specialties for various magazines, and in 1895 attempted to found in San Francisco a therapeutic college for the promulgation of his views and theories.

BUCHANAN, Robert William, a versatile writer of poetry and prose; born in Staffordshire, England, Aug. 18, 1841. He was educated at Glasgow University, and while a mere boy went to London to seek his fortune. His first work, *Undertones*, a volume of verse published in 1863, was well received; but his first distinct success was *London Poems*, published in 1866. Later volumes of verse are a translation of Danish ballads, and *Wayside Posies* (1866); *North Coast Poems* (1867); *Napoleon Fallen: A Lyrical Drama* (1871); *The Drama of Kings* (1871); *Ballads of Love, Life and Humor* (1882); and *The City of Dream* (1888). He has contributed prose to the magazines, and has written several novels, among them *A Child of Nature* (1879); *God and the Man* (1881); *The Martyrdom of Madeline* (1882); and *Foxglove Manor* (1884). He has also been successful as a dramatist, and in 1893 published a powerful poem, entitled *The Wandering Jew*. Buchanan was in turn essayist, satirist, critic, dramatist, novelist and versifier. As a critic, he affected the methods of a free-lance and stolidly endured the criticism that his trenchant articles provoked. His range of subjects has been wide, his ideals unsettled, but his good faith beyond question. An American critic well said of his work: "He veneers his solid Billingsgate with rhetoric of some color and polish; but all this must not blind us to the fact that he has ideals, and that he does truly regard the great names with which he makes free, and venerates them."



ROBERT W. BUCHANAN.

BUCHANITES, a sect of fanatics which sprang up in the west of Scotland in the last quarter of the eighteenth century. Its founder was Elspeth Buchan, born in 1738, the daughter of John Simpson, a wayside innkeeper near Banff. Separating from her husband, Robert Buchan, she began to preach, and in 1783, in conjunction with the Rev. Hugh White, founded the sect which bore her name. She claimed to be the woman mentioned in the first six verses of the twelfth chapter of Revelations. Expelled from the town by the magistrates in 1784, they established themselves near Thornhill with a few followers. The poet Burns, in a letter (August, 1784), speaks of their idleness and immorality. Mrs. Buchan died in May, 1791; the last survivor of her sect died in 1848.

BÜCHNER, Friedrich Karl Christian Louis, a German physician and materialist philosopher; born at Darmstadt, March 29, 1824. He studied at Giessen, Strasburg, Würzburg and Vienna; became a lecturer at Tübingen University, and in 1855 published *Kraft und Stoff* (14th ed., 1876; English translation, *Force and Matter*, 1870), in which he attempted scientifically to establish a materialistic view of the universe. As a result of the controversy caused by the appear-

ance of this work, Büchner was compelled to resign his university post, and began medical practice in Darmstadt. He has been a frequent contributor to periodicals on physiological and pathological subjects, as also in support of his atomistic philosophy. *Natur und Geist* (1857, 3d ed., 1876) and *Aus Natur und Wissenschaft* (1862) are works in the latter department. He has also written on Darwinism; the idea of God; the intelligence of animals; and has translated Lyell's *Antiquity of Man* (1864). In 1872 he visited the United States, lecturing frequently in the principal cities. A large portion of the subject-matter in these addresses has been preserved in *Materialism: Its History and Influence on Society* (1873). See also EVOLUTION, Vol. VIII, p. 767.

BUCHTEL COLLEGE, an educational institution for the co-education of the sexes, situated at Akron, Ohio, where it was opened, on September 11, 1872. While founded by the Ohio Universalist Convention, it received its name in honor of John R. Buchtel, whose benefactions to the college exceeded half a million dollars. The course of study is divided into three branches—classical, philosophical and scientific. The degrees conferred are A.B., Ph.B. and B.S. The college has an excellent astronomical department and observatory. There are 15 instructors, under the presidency of the Rev. Orello Cone, D.D. The students average 250, and the college has over $290,000 in productive funds.

BUCK, DUDLEY, one of the first American composers with high aims who has met with a proper recognition of his labors, was born in Hartford, Connecticut, March 10, 1839. He studied at Trinity College, and received a musical education at the Leipsic Conservatory of Music, and afterwards was instructed by Hauptman, Rietz, Richter, Plaidy, Moschelles and Schneider. He has been organist of the Music Hall, Boston, assistant director of the New York Garden Concerts, organist of Holy Trinity in Brooklyn, and director of the Apollo Club. Mr. Buck has written operettas, organ compositions, song music, and has published *A Dictionary of Musical Terms* and *The Influence of the Organ in History*. The wide popularity which his music enjoys is due to the fact that the strictness and thoroughness of his early training have not interfered with the play of his fancy or the freedom of his invention. His orchestral scores show him to be a master of coloring as well as of form, and in all his compositions this technical knowledge has earned the warmest praise from the most critical judges. He wrote the festival hymn, *O Peace! On Thine Upsoaring Pinions*, for the peace jubilee at Boston in 1872, and a cantata, *The Centennial Meditation of Columbia*, for the opening of the Philadelphia exhibition of 1876, besides many other works. In 1885 appeared *The Light of Asia* (text from Sir Edwin Arnold's poem), the longest of his compositions. His *Golden Legend*, based on Longfellow's poem of the same title, won the $1,000 prize offered by the Cincinnati Music Festival Association.

BUCKALEW, CHARLES R., an American statesman; born in Pennsylvania, Dec. 28, 1821; was admitted to the bar in 1843, and became prosecuting attorney of Columbia County in 1845. He was in the state senate from 1850 to 1856, and in 1858–61 was United States minister to Ecuador. In 1863 he became United States Senator, and in 1869 returned to the state senate. He was a prominent member of the constitutional convention of 1872; in 1886 he was elected to Congress, and was re-elected in 1888, as a Democrat.

BUCK-BEAN, a popular name applied to *Menyanthes trifoliata*, a common bog-plant of the family *Gentianaceæ*. Its white or pinkish flowers are borne in a cluster upon a stout scape whose base is sheathed by one or more long petioles bearing three oval leaflets. The whole plant yields a bitter principle used in medicine. Other popular names are "bog-bean" and "marsh-trefoil."

BUCKEYE, an American name for several trees and shrubs of the same genus (*Æsculus*) as the horse-chestnut. (See HORSE-CHESTNUT, Vol. XII, p. 206.) "Buckeye" is also a popular name for the state of Ohio and its inhabitants.

BUCKHANNON, a town of northeast central West Virginia, the county seat of Upshur County. It is situated on the West Virginia and Pittsburg railroad, about 90 miles E.N.E. of Charleston, and has considerable lumber trade. Population 1890, 1,403.

BUCKIE, a fishing-town of Banffshire, Scotland, situated 13 miles N.E. of Elgin by rail. It is the head of the fishery district from Banff to Findhorn. The present harbor, constructed of concrete at a cost of £60,000, consists of an outer and an inner basin, with an area of nine acres. Population, 4,350.

BUCKINGHAM, JAMES SILK, English traveler and lecturer; was born at Flushing, near Falmouth, in 1786, and went to sea at an early age. After years of unsettled and wandering life, he established a journal at Calcutta, the boldness of whose strictures on the Indian government led to his expulsion from Bengal. In London he established the *Oriental Herald* (1824), and the *Athenæum* (1828), now the leading weekly literary journal. He subsequently traveled through the United States. He was projector of a literary club, the British and Foreign Institute (1843–46), and president of the London Temperance League (1851). Besides 18 books of travel, etc., he had published two volumes of his autobiography when he died, June 30, 1855.



WILLIAM A. BUCKINGHAM.

BUCKINGHAM, WILLIAM ALFRED, Connecticut's war governor, who, without resorting to a single draft, sent 55,000 soldiers (more than 6,000 over the state's quota) to the Union army. He was born in Lebanon, Connecticut, May 28, 1804; became a manufacturer

in Norwich, and was four times mayor of the city. Elected governor of his native state in 1858, he served till 1866, refusing re-election in the latter year; was United States Senator from 1869 until his death. He gave $25,000 to Yale Theological Seminary. Died in Norwich, Connecticut, Feb. 3, 1875.

BUCKLAND, CYRUS, inventor; born in Manchester, Connecticut, Aug. 10, 1799; was educated at a common school. At the age of 21 he became interested in mechanical pursuits, and in 1828 entered the United States armory at Springfield, Massachusetts, as pattern-maker, where he subsequently became designer of machinery and tools for the manufacture of fire-arms. While occupying this position he made great improvements, both in the machinery used and in the guns, raising the standard in all the mechanical departments. His chief invention was a set of machines for working up gun-stocks from the rough state till they were complete, except the outward smoothing. So important was this invention that the British government sent commissioners over to copy the machines and to obtain skilled workmen from the Springfield armory. Mr. Buckland received no compensation for his valuable inventions beyond his daily wages; but at his retirement in 1859, Congress voted him $10,000. He died Feb. 26, 1891.

BUCKLAND, FRANCIS TREVELYAN, one of the most eminent practical naturalists of his day in England, was the eldest son of the Rev. William Buckland, D.D., dean of Westminster. He was educated at Winchester School and Christ Church, Oxford; studied medicine, and for some time served as assistant surgeon to the Second Life Guards. Establishing a museum of economic fish-culture at his own expense, he was appointed inspector of salmon-fisheries, subsequently serving on several royal commissions. Among his best-known works are *Curiosities of Natural History: A Familiar Book of British Fishes*, and an *édition de luxe* of Gilbert White's famous classic, *The Natural History of Selborne*. He died Dec. 19, 1880.

BUCKLANDIA, the generic name of a large and handsome tree of the mountains of Asia, belonging to the family *Hamamelidaceæ*, to which family belong the *Hamamelis*, or "witch-hazel," and the *Liquidambar*, or "sweet-gum," of the United States.

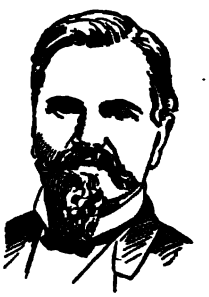
BUCKLE, GEORGE EARLE, editor of the London *Times;* born June 10, 1854; won the Newdigate prize at Oxford, 1875, and graduated B.A. in 1876, and M.A. in 1879. He was a fellow of All Souls' College (1877–85), and in 1880 became a member of the editorial staff of the London *Times*, being appointed editor in February, 1884, on the death of Mr. Chenery. He married, in 1885, a daughter of James Payn, the novelist.

BUCKLEY, JAMES MONROE, a prominent Methodist divine; born in Rahway, New Jersey, Dec. 16, 1836. He was educated at Pennington Seminary, New Jersey, and Wesleyan University. He has been pastor in Detroit, Michigan, and in Brooklyn, New York; has three times been a member of general conference, was elected editor of *The New York Christian Advocate*, and has written *Two Weeks in the Yosemite Valley; Cats and Wild Cats; Land of the Czar and the Nihilist; Faith Healing;* and other books.

BUCKLEY, SAMUEL BOTSFORD, an American scientist; born in Torrey, Yates County, New York, May 9, 1809; educated at the Wesleyan University; assisted in the state survey of Texas in 1860; acted with the United States sanitary commission in the Civil War; was state geologist of Texas from 1866 to 1867, and later edited the *State Gazette* of Austin, Texas. He contributed many articles to scientific periodicals, and compiled a work on the flora and trees of the United States. He died in Austin, Texas, Feb. 18, 1884.

BUCKMINSTER, JOSEPH, an American divine; born at Rutland, Massachusetts, Oct. 14, 1751; was educated at Yale, and became pastor of a church at Portsmouth, New Hampshire. He was an eloquent and popular preacher. Died in Vermont, June 10, 1812.—His son, JOSEPH STEVENS BUCKMINSTER, the rival and friend of Channing, was born at Portsmouth, New Hampshire, May 26, 1784; was educated at Harvard, and later was chosen pastor of Boston's Brattle Street Church. He had considerable oratorical ability, and was one of the founders of Boston's literary reputation. He died June 9, 1812.

BUCKNER, SIMON BOLIVAR, a Confederate general; born in Kentucky in 1823; graduated at West Point in 1844; was there made professor of ethics in 1846, and assistant instructor of infantry tactics from 1848 to 1855. He subsequently practiced law, and at the outbreak of the Civil War joined the Southern army. He surrendered Fort Donelson to General Grant, Feb. 16, 1862, with 16,000 troops and abundant munitions of war; was imprisoned in Boston harbor, and on his exchange took command in Bragg's army; was made major-general, fought at Murfreesboro and Chickamauga, and was included in Kirby Smith's surrender to General Canby, at Baton Rouge, May 26, 1865. In 1887 he was elected governor of Kentucky. His visit to the bedside of the dying Grant at Mt. McGregor was the subject of much encomiastic comment in every section of the Union. At the sound-money convention of the National Democratic party, held at Indianapolis, Sept. 3, 1896, General Buckner was nominated for Vice-President with General Palmer of Illinois, for President, but the ticket carried no state.



SIMON B. BUCKNER.

BUCKNILL, SIR JOHN CHARLES, the father of the English volunteer soldiery, and a well-known surgeon; born at Market Bosworth, England, in 1817; educated at Bosworth and Rugby schools; studying medicine, he was chosen as the first medical superintendent of the Devon County Lunatic Asylum, an office he held from 1844 until 1862, when

and until 1876 he served as the Lord Chancellor's medical visitor of lunatics. In 1853 he originated, and for nine years thereafter edited, *The Journal of Mental Science.* In addition to this he has written many medical and scientific works, among which are *Unsoundness of Mind in Relation to Criminal Acts* (1857) and *The Manual of Psychological Medicine* (1858). In 1852 he obtained permission to enroll and embody the First Devon and Exeter Volunteer Rifles, and was the first recruit sworn in for this senior volunteer regiment. He was knighted in July, 1894. Died July 20, 1897.

BUCKS, COUNTY OF. See BUCKINGHAM, Vol. IV, p. 415.

BUCKSPORT, a village of Hancock County, in the southeastern portion of the state of Maine, situated on the west bank of the Penobscot, 20 miles below Bangor and 16 miles N.E. of Belfast, on the Maine Central railway. It is the seat of the East Maine Conference Seminary, and contains various manufactories. The harbor is accessible to large vessels, and ship-building and fishing are the chief industries. Population 1890, 2,921.

BUCKSTONE, JOHN BALDWIN, comedian and dramatic writer; born at Hoxton, London, in 1802; died Oct. 31, 1879. Having, in 1822, exchanged an attorney's office for the provincial stage, he appeared the next year at the Surrey Theatre. His success was so unequivocal that in 1827 he was engaged by the Adelphi Theater, where he continued till 1833 as leading low comedian. He was an ideal Tony Lumpkin, Bob Acres, Sir Andrew Aguecheek, Touchstone and Master Slender. Except for a visit to the United States in 1840, and short engagements at Drury Lane and the Lyceum, he thenceforward played chiefly at the Haymarket, of which he was lessee from 1853 till 1878. Buckstone's acting was noted for its distinct appreciation of the peculiar traits in each individual character he assumed. He was also a prolific dramatic author, and several of his pieces have been highly popular. Among the best known are *The Flowers of the Forest; The Green Bushes; The Rough Diamond; Good for Nothing; The Alarming Sacrifice; The Irish Lion.* In spite of his many-sided successes, Buckstone was unfortunate in money matters and died in needy circumstances.

BUCKTHORN, a popular name primarily applied to species of the genus *Rhamnus*, but extended to other spiny members of the family *Rhamnaceæ*, and even to species of allied families. The genus *Rhamnus* is characterized by its opposite stamens, perigynous or epigynous flowers, small often concave petals, a disk surrounding the base of the ovary, which develops into a juicy drupe, with two to four stones. The common buckthorn (*Rhamnus catharticus*) is characterized by its spinous and cross-like branchlets, serrate leaves and yellow-green diœcious flowers. The berries are violently purgative and were formerly much used in medicine. They supply the sap-green of painters. The bark affords a beautiful yellow dye. Dyer's buckthorn (*Rhamnus infectorius*) is a low shrub, abundant in the south of Europe, whose unripe fruit yields a brilliant yellow dye. The alder-buckthorn (*Rhamnus frangula*, or *Frangula Caroliniana*) is spineless, with oval entire leaves, and small, whitish, axillary flowers. The charcoal of the wood is light, and is used by gunpowder makers. From the bark of *R. Purshiana* is obtained the "cascara sagrada" of medicine.

BUCKWHEAT (*Fagopyrum esculentum*, or *Polygonum Fagopyrum*) is a native of the basin of the Volga, the shores of the Caspian Sea and many parts of central Asia. The resemblance of this seed in form to the beech-nut is supposed to be the reason of the German name, *buchweizen* (literally "beechwheat"), from which the English name is derived. Buckwheat is a very common crop in some parts of Europe and of the United States of America. It yields abundantly, and requires little manure or attention. Forty bushels or more per acre may be expected, weighing 46 or 48 pounds per bushel; and, notwithstanding the resemblance of the seed to grain in its qualities and uses, wheat or any other cereal crop generally succeeds well after buckwheat. The seed is most frequently used in the shape of groats, or made into pottage; in the United States thin cakes of the flour are a standard food. See AGRICULTURE, in these Supplements.

BUCKWHEAT-TREE, a name applied to species of *Cliftonia*, small evergreen trees of the southern United States, with white fragrant flowers of the family *Cyrillaceæ*. Also, popularly called "titi" and "ironwood."

BUCOLIC, a term derived from the Greek word signifying "belonging to herdsmen," nearly equal to *pastoral*, from Latin. It is especially used of a kind of pastoral poetry representing rural affairs, or the life, manners and occupation of the shepherds. The great bucolic poets were Theocritus, Bion, Moschus; and Virgil's Eclogues are sometimes called *Bucolica*. Sicily has been called the native home of bucolic poetry. See SICILY, Vol. XXII, p. 21.

BUCYRUS, a town of northern central Ohio, county seat of Crawford County, and center of three railroads. It is situated on the Sandusky River, 65 miles N. of Columbus. It is the center of an extensive farming district, and the headquarters of numerous manufacturing industries. A fossil mastodon was discovered here in 1838. In the town and its vicinity occur a number of valuable mineral springs. Population 1890, 5,974.

BUCZACZ, a town of Austria, in Galicia, situated on the Stripa, an affluent of the Dniester, 47 miles N.E. of Stanislau by rail. A treaty of peace between the Poles and Turks was signed here in 1672. Population 1890, 9,970.

BUD, in plants, the plant-individual. See MORPHOLOGY, Vol. XVI, p. 841.

BUDAPEST, one of the capitals of Austria-Hungary, and the second largest city in that empire. (See PESTH, Vol. XVIII, p. 691.) On June 8, 1892, it was made one of the capitals of the empire and the seat of an imperial residence. It

has excellent transportation facilities, being on eight or ten railroads, and having a large trade on the Danube River. The street-railway system is one of the best in existence, consisting of electric lines on all the important streets, which have, instead of trolley wires, conduits between the tracks from which the power is collected off metal strips. The city has been remarkably free from the accidents incident to traffic on surface railroads. The municipal council has, however, withheld permission to build a road on Andrássy Strasse, though it is soon to have an underground road. This street is wide, well paved, clean, and lined with handsome buildings, and is one of the most beautiful streets in the world. The other streets have been straightened to a considerable extent, and many sanitary reforms have been carried out, so that the death rate has fallen from 5 to 2.9 per cent. Besides the buildings mentioned in the article on PESTH, already referred to, various new ones of importance have been built or improved. The new House of Parliament, completed for use, is one of the finest capitol buildings of Europe. The Jewish Synagogue is the handsomest place of worship in the city; others of large size and beauty are the Leopold Basilica, completed in 1868; the library, containing over 400,000 volumes and 63,000 manuscripts. On a high eminence, on the Buda side of the Danube, is the imposing Royal Palace, around which the city is spread like an amphitheater. The city has many baths, supplied from the river and from mineral springs, which are plentiful here. The water from some of these springs, especially Hunyadi Janos and Rakosczy, are bottled and shipped abroad in large quantities. These springs, mostly impregnated with sulphur, have considerable reputation, and large numbers of health-seekers visit them. In manufactures the city has not only increased the annual product, but the number and kind of factories. It now puts upon the market, besides the articles mentioned in Vol. XVIII, pp. 691–693, agricultural tools, wagons, ships, wines of very fine variety, beer, starch, woolen goods, arms, etc. The University of Pesth contained, in 1890, 210 lecturers and professors, and 3,660 students. A great millennial festival of Hungary was celebrated at Budapest in 1896 to commemorate the alleged thousandth anniversary of the founding of the Arpad dynasty. It took the form of an industrial and art exposition, and was opened by the Emperor on the 2d of May. Population of the city in 1890, 506,384.

BUDDING, in horticulture, a process in the propagation of ligneous plants analogous to grafting. See HORTICULTURE, Vol. XII, p. 237.

BUDDLEIA, a genus of shrubs of the family *Scrophulariaceæ*, of which many species are known, all natives of the warmer parts of the world, and some of them much admired for their beautiful flowers. *Buddleia globosa*, a native of Chile, is hardy enough to endure the climate of most parts of England, and several half-hardy species have also been introduced.

BUDINGER, MAX, a German historian; born at Cassel, April 1, 1828; educated at the universities of Bonn, Marburg and Berlin; chosen professor of universal history at Zurich University in 1861, he returned to Vienna in 1872 as professor of history and director of the Historical School. His literary works were numerous and of varied subject-matter. Many of his contributions appeared in the Vienna University *Bulletin*. His books include *A History of Austria to the End of the Thirteenth Century* (1858); *A Book of Hungarian History* (1866); *Wellington* (1869); *Lafayette* (1870); and *Egyptian Influence on Hebrew Culture* (1875).

BUDISSIN, the Wendish name of BAUTZEN; q.v., Vol. III, p. 450.

BUDRUN, a seaport town of Asiatic Turkey, situated on the north shore of the Gulf of Kos, about 96 miles S. of Smyrna. It is the site of the ancient Halicarnassus, the birthplace of Herodotus and Dionysius. Population 1890, 6,000.

BUEL, SAMUEL, an American theological writer and professor; born in Troy, New York, June 11, 1815; educated at Williams College, held several pastoral charges in Michigan, Pennsylvania, Maryland and New York. He was appointed professor of ecclesiastical history and (later) of divinity in the Seabury Theological School, Faribault, Minnesota, and in 1871 professor of systematic divinity and dogmatic theology in New York General Seminary. His works were numerous and theological, and included a *Report of the Bonn Conference* and a *Treatise on Dogmatic Theology* (1890). He died in New York City, Dec. 30, 1892.

BUELL, DON CARLOS, an American officer; born near Marietta, Ohio, March 23, 1818. After graduation at the United States Military Academy in 1841, he became first lieutenant, Third infantry, June 18, 1846, and won the brevet of captain at Monterey, and that of major at Contreras and Churubusco, where he was wounded. In 1848–49 he was assistant adjutant-general at Washington, and until 1861 was at the headquarters of various departments. On May 11, 1861, he was made a lieutenant-colonel and appointed brigadier-general of volunteers, May 17, 1861. After organizing troops in Washington he was assigned to a division in the army of the Potomac, which became noted for its discipline. He succeeded Gen. W. T. Sherman in the department of the Cumberland, which was reorganized as that of the Ohio. He accumulated a splendid drilled army of 100,000 men, but failed to utilize them. On March 21, 1862, he was made major-general of volunteers, and his department united with that of the Mississippi, commanded by Major-General Halleck. By the aid of his division, which arrived at Shiloh, April 6th, the Confederates, under Gen-



GENERAL BUELL.

eral Beauregard, were driven to Corinth. On June 12, 1862, he assumed command of the district of Ohio. Owing to General Braxton Bragg's advance into Kentucky, he was obliged to evacuate central Tennessee, and to retreat to Louisville, where his army arrived, September 24th, in great excitement, for it was feared that Bragg would reach there first. On September 30th, by order from Washington, General Buell gave up his command to Gen. G. H. Thomas, who declined to succeed him, and he was restored on the same day. Part of his army, under Gen. A. M. McCook, fought the Confederates at Perryville, October 8th, but were disastrously defeated. A court-martial was held, and Buell was acquitted. Andrew Johnson, then military governor of Tennessee, protested against his ever doing duty in that state, and he was transferred to the department of the Gulf, where his strategic manœuvers yielded no definite results. He resigned June 1, 1864. He was mustered out of the volunteer service May 23, 1864. In 1865 he became president of the Green River Iron Works of Kentucky, and subsequently held the post of pension agent at Louisville, Kentucky.

BUENAVENTURA, a Pacific coast town of the department of Cauca, in the republic of Colombia. It has a hot, sickly climate, but is the port for the healthful and rich Cauca valley. Most of the commerce of Cauca goes through this port, the submarine cable touches here, and it is the terminus of the railway from Córdoba. Population 1890, 5,000.

BUENA VISTA, a mining city of central Colorado, county seat of Chaffee County. It is situated at an altitude of nearly 8,000 feet, near the confluence of Cottonwood Creek with the Arkansas River, about 35 miles S. of Leadville, on the Union Pacific, Denver and Rio Grande and Colorado Midland railroads. The interests of many of the richest silver-mines of the state center here, and the surrounding country includes also a small but fertile agricultural section. The climate is mild and healthful, and in the neighborhood are a number of favorite health-resorts. Population 1890, 1,500.

BUENA VISTA, a town of western Georgia, county seat of Marion County, situated 36 miles S.E. of Columbus, on the Central Railroad of Georgia. Population 1890, 788.

BUENA VISTA, a village of Mexico, 7 miles S. of Saltillo, where, on Feb. 22–23, 1847, some 5,000 United States troops under Taylor defeated 20,000 Mexicans under Santa Anna. See TAYLOR, ZACHARY, Vol. XXIII, p. 96.

BUEN-AYRE OR BONAIRE, a West Indian Island, 60 miles from the coast of Venezuela, and 30 E. of Curaçoa, belonging to the Dutch. It produces timber, cattle, cochineal and salt. Area, 127 square miles; population, 4,898.

BUENOS AYRES, the capital of the Argentine Republic. For location, map and history, see BUENOS AYRES, Vol. IV, p. 440. The capital of the province was removed in 1882 to LA PLATA (q.v.). The rivalry of Montevideo for foreign and inland trade led to the appropriation, in 1887, of $20,000,000 for harbor improvements, permitting the largest vessels to be brought alongside the wharves. The growth of the population has been remarkable, the census returns of 1895 giving the number of urban and suburban inhabitants at 677,532. Of these over 150,000 are foreigners. The population has more than doubled in 20 years, the increase being chiefly from Italy, Spain, France and England. There are two universities, with an attendance of 993 students. Buenos Ayres has also 285 primary schools. Nearly 100 periodicals are published in the city, in the French, Spanish, English and Italian languages. The principal buildings are the cathedral, a magnificent edifice; the chapel of Santa Felicitas, with elaborate frescoes; the university; a military college; the new post-office; the mint and government offices. A Congress hall, to cover 16 acres, was projected at a cost of $8,000,000 in 1887. There are numerous industrial enterprises, including manufactories of cigars, carpets, cloth, furniture and boots and shoes. The city is the seat of an archbishopric, and possesses several public libraries and museums, eleven hospitals and many charitable institutions. Cable communication exists with Europe and the United States. A continental exhibition was held here in 1882.

BUFFALO, common name for the American BISON; q.v., Vol. III, p. 792; and in these Supplements.

BUFFALO, a city, port of entry and railroad and commercial center of Erie County (of which it is the county seat), in the state of New York. (See also BUFFALO, Vol. IV, p. 443.) The city gradually rises from the water's edge to a height of 50 or 60 feet above the level of the harbor. It is noted for its wide, level, shaded streets, paved with asphaltum. The water of the Niagara River is furnished to the inhabitants by a tunnel, through which and 281 miles of mains it is distributed to consumers. The park system is extensive, and includes Forest Lawn Cemetery, containing 75 acres, and a beautiful lake, dotted with numerous islands, covering 40 acres. The harbor, which is protected by a breakwater 4,000 feet long, is guarded by Fort Porter. The old fort, built in 1812, has disappeared. Buffalo received its greatest impetus upon the completion of the Erie Canal in 1825. The chief business transacted is the receiving, transferring and storing of grain. Large quantities of live-stock are also dealt in. In iron and steel products it ranks next to Pittsburg, and it also has a large trade in lumber. It ranks among its industrial establishments four furnaces, large rolling-mills, car-shops, iron shipyards, stove foundries, tanneries, breweries, flour-mills and manufactories of agricultural implements. The county hall is an imposing edifice of Maine granite. The United States customhouse and post-office, the state arsenal and the county penitentiary, are all substantial buildings. A state asylum for the insane in North Buffalo has accommodation for 1,500 patients. One hundred and sixty churches are scattered through

the city, the handsomest of these being St. Joseph's Cathedral. St. Paul's, a brownstone structure, was burned in 1888. The public schools comprise 36 district schools, a state normal and the Central High School. A number of daily newspapers are published. Two libraries, the Grosvenor and that of the Young Men's Association, have an aggregate of 70,000 volumes. In the latter building are kept the collections and records of the Historical Society and the Society of Natural History, and space is afforded for the Mechanics' Institute. Population 1890, 255,664.

BUFFALO, a town of southeast central Minnesota, the county seat of Wright County. It is situated on Buffalo Lake, 10 miles from the Mississippi River, on the Minneapolis, St. Paul and Sault Ste. Marie railroad, 45 miles W.N.W. of St. Paul. Several lumber-mills are located here. Population 1890, 606.

BUFFALO, a town of southwest central Missouri, the county seat of Dallas County. It is situated 28 miles S.W. of Lebanon, where the St. Louis and San Francisco railroad is the nearest railroad. Saw, flour and carding mills are operated, and it is the center of a farming and fruit-raising district. Population 1890, 861.

BUFFALO, a town of northern central Wyoming, county seat of Johnson County; situated 130 miles E. of Billings, Montana, and with Clearmont, on the Chicago, Burlington and Quincy railroad, as its nearest railroad station. It has two flour-mills, and is the center of a farming and stock-raising district. Population 1890, 1,087.

"BUFFALO BILL," pseudonym of CODY, WILLIAM F.; q.v., in these Supplements.

BUFFALO-BERRY, a name applied to *Shepherdia argentea* and its fruit, a plant of the family *Elæagnaceæ*. It is a somewhat spiny shrub, 5 to 20 feet high, with leaves silvery scurfy on both sides, and a scarlet acid edible berry, for which it is somewhat cultivated. It ranges east of the Sierra Nevadas to the western part of the region of the Great Lakes. Its more eastern representative (*S. Canadensis*) has leaves scurfy only beneath, and with rusty scales and an insipid fruit.

BUFFALO-FISH, a name given to a number of large suckers occurring in the Mississippi and its tributaries. They are not much esteemed for food.

BUFFINGTON, ADELBERT R., an American soldier; born in Wheeling, West Virginia, Nov. 22, 1837. He graduated at the United States Military Academy in 1861. He was made first lieutenant of ordnance in 1862. For a year he was engaged in mustering Missouri and Illinois volunteers, afterward assisted in the defense of Pilot Knob, and was successively commander of the arsenals at New York, Baton Rouge, Watertown, Detroit, Watervliet, Indianapolis, Allegheny, and in 1881 was placed in command of the National Armory. For 11 years he was on leave of absence, inspecting arms for the Egyptian government. He has perfected various inventions, among them the magazine-gun and carriages for light and heavy guns. He reduced the cost of manufacturing rifles at the Springfield armory, and was the originator of the niter and manganese method of bluing iron and steel, in use at the National Armory.

BUFF-LEATHER, a kind of thick leather, originally and properly made from the skin of the buffalo, but more recently made of the hides of elk and oxen. It is dressed as flexibly as possible, and without any glazed or artificially colored surface. Its principal use is for belts, pouches, rifle-slings and gloves, especially in European military commands, where it is made to carry a showy and heavy coat of pipe-clay. In its natural color, a dull yellow, it was used in the middle ages in the place of light armor. Shakespeare refers to a suit of buff, in the *Comedy of Errors*, and Butler, in his *Hudibras*, mentions it as cudgel-proof if not sword-proof. The undressed and un-pipe-clayed buff was used for uniform facings in the English army, and gave the name of "The Buffs" to the Third and Thirty-first regiments of infantry, and that of the "Ross-shire Buffs" to the Seventy-eighth Scotch regiment. The familiar names survive, although the territorial system has destroyed their official use.

BUFFOON (Italian, *buffa*, "a trick"), one who entertains others by tricks, odd gestures and other vulgar pleasantries; a clown. From the same word comes *buffo*, "a comic actor or singer," and the French name, *opera bouffe*, for comic opera. See FOOL, Vol. IX, p. 366.

BUFORD, JOHN, an American general, half-brother of Napoleon B. Buford; born in Kentucky in 1825; died in Washington, District of Columbia, Dec. 16, 1863. He was a West Point graduate, served against the Indians on the plains, and at the commencement of the Civil War was assistant inspector-general. In 1862 he entered active service, being on the staff of General Pope in northern Virginia, engaged at Madison Court-house, the passage of the Rapidan, Kelly's Ford, Thoroughfare Gap, Manassas, South Mountain, Antietam, Fredericksburg, Gettysburg, and many other battles. Just before his death he was assigned from the army of the Potomac to the army of the Cumberland. Buford was an admirable cavalry officer. He died from the effects of exposure and wounds. A massive and lifelike statue of Buford was unveiled in 1896 on the battlefield of Gettysburg.

BUFORD, NAPOLEON BONAPARTE, an American general and engineer; born in Woodford County, Kentucky, Jan 13, 1807; died March 28, 1883. He was a West Point graduate, served as lieutenant of artillery on various surveys, and was appointed as instructor at West Point. In 1861 he entered the Union army; was engaged at the battles of Belmont, Missouri; Island No. 10; and at the sieges of Corinth and of Vicksburg. In 1865 he was brevetted major-general of volunteers, and five months later (August) mustered out of service. After the close of the war General Buford was United States Commissioner of Indian Affairs (1868), and inspector of the Union Pacific railway (1867–69).

BUG OR BOG, a river of Russia, in the governments of Podolia and Kherson; joins the Dnieper 30 miles W. of Kherson. It corresponds with the ancient Hypanis; is about 400 miles long, and is navigable from Voznesensk. It is also the name of a river which rises in Galicia and joins the Vistula in Russian Poland, 17 miles N.W. of Warsaw. Its total course exceeds 400 miles.

BUGBANE OR BUGWORT, a name applied to species of *Cimicifuga*, a genus belonging to the family *Ranunculaceæ*. The flowers are in long conspicuous racemes, the sepals and petals either minute or falling as the flower opens, the numerous white stamens making the showy part of the cluster. The name, both technical and popular, indicates a reputed use in destroying insects. *C. Americana* is also called "black snakeroot."

BUGEAUD, THOMAS, French marshal; born at Limoges in 1784; died of cholera, at Paris, June 9, 1849. He entered the army at the age of 19, and by his bravery during the Napoleonic campaigns earned a colonelcy, which was bestowed in 1814. Recalled from a 15 years' retirement to active life by the revolution of July, 1830, he was elected Deputy for Périgueux, and soon gained Louis Philippe's esteem; in 1836 was dispatched to Algeria, where he distinguished himself against Abd-el-Kader, and in 1840 was appointed Governor-General. The Zouaves owed their organization to him. In 1843 he received the marshal's baton, and the following year his victory at Isly over the emperor of Morocco's forces gained him the title Duc d'Isly. In the revolution of February, 1848, he commanded the army in Paris.

BUGFISH, a name sometimes given to the menhaden (*Brevoortia tyrannus*), a fish found along the Atlantic coast of the United States. The name was given because a small isopod crustacean, *Cymothoa*, lives in the mouth.

BUGGE, ELSEUS SOPHUS, a Norwegian philologist, born at Laurvik, Jan. 5, 1833; studied at Christiania, Copenhagen and Berlin, and in 1866 was appointed professor of comparative philology and Old Norse at the University of Christiania. His Old Norse ballads (1858) and historical legends (1864–65), critical edition of the earlier *Edda* (1867), studies in ancient Italian dialects (1878) and on the origin of the Scandinavian legends of gods and heroes (1881–82), besides numerous dissertations on all departments of the Teutonic and Romanic languages, place him in a leading position among living philologists.

BUGIS, the name of the inhabitants of the kingdom of BONI; q.v., Vol. IV, p. 32.

BUGLE, a treble instrument of brass or copper (immortalized by Tennyson by his *Bugle Song*, in *The Princess*), which differs from the trumpet in having a shorter and more conical tube, with a less expanded bell. It is played with a cupped mouthpiece. In its original form the bugle is the signal-horn for infantry as the trumpet is for the cavalry, and is usually tuned in C, with an extra B♭ crook, or in E♭. Only five sounds are required for the various calls and signals, while the instrument can produce eight. Two methods were adopted for bridging over the gaps between notes; viz., keys and valves. The key-bugle, also known as the "Kent bugle," or the "Regent's bugle," was very popular half a century ago. In the Austrian military bands it is often heard with superb effect, and is known as the Flügelhorn. See also OPHICLEIDE, Vol. XVII, pp. 778, 779.

BUGLE, the common name of *Ajuga reptans*, a low plant of Europe, of the family *Labiatæ*. Its flowers are generally blue, but white and purplish varieties are sometimes grown in flower-borders. *Ajuga alpina* is one of the beautiful flowers of the Swiss Alps. Species of *Lycopus*, another labiate genus, are called "bugle-weeds" in the United States.

BUGLOSS, a name applied to several species of the family *Boraginaceæ* (or *Asperifoliaceæ*). The "bugloss" of the United States is *Lycopsis arvensis*, a European weed introduced in sandy fields. In Europe the name applies not only to *L. arvensis*, but also to *Anchusa officinalis*. The "viper's bugloss" is *Echium vulgare*, another European weed introduced into the United States. All these species are coarse and rough.

BÜHLER, JOHANN GEORG, a noted German Indologist; born at Borstel, in Hanover, July 19, 1837; educated at the University of Göttingen, in Paris and in London. He was appointed assistant librarian at Göttingen in 1862, and in the following year accepted the chair of ancient history and Oriental languages in Elphinstone College, Bombay. In 1868 he was appointed inspector of schools for Gujarat, or Northern Bombay, and commissioned to collect and report on Sancrit MSS. His district was vast and insalubrious, and his labors so exacting, that he was compelled to return to Europe in 1880 on account of his health. He then accepted the chair of Sanskrit in the University of Vienna. He issued several Sanskrit texts and a standard *Digest of Hindu Law* (1867).

BUHRSTONE OR BURRSTONE, a hard, cellular silicious stone used for millstones. See FLOUR, Vol. IX, p. 345; GEOLOGY, Vol. X, p. 237.

*BUILDING AND LOAN ASSOCIATIONS. For general article on this subject, see BUILDING SOCIETIES, Vol. IV, pp. 513, 514. The term *building and loan association* is used to cover all associations where the object is to furnish a safe means for the accumulation of savings, accompanied by an opportunity to borrow money at reasonable rates for the purpose of building homes. Such associations are known under the title as given; also as mutual loan associations, homestead aid associations, savings fund and loan associations, co-operative banks, co-operative savings and loan associations, and other similar titles, but "building and loan association" is more generally used than any other title for organizations having the purpose stated.

Such associations are private corporations, designed for the accumulation by the members thereof, of savings, through periodical payments into the association's treasury, the funds being invested, from time to time, in loans, to the members, upon real estate, for the purpose of building

* Copyright, 1896, by The Werner Company.

homes, but the borrowers pay interest and a premium to enable them to secure loans over other members. Borrowing members continue their fixed periodical installments in addition to the interest and premium they pay. All these payments, together with the payments made by non-borrowers, fines for failure to pay fixed installments, forfeitures, fees for transfer of stock, membership fees, and all other revenues from whatever source, go into the common fund until such time as the installments and profits together aggregate the face value of all the shares in the association, when the assets, after payment of expenses and losses, are prorated among all members, which proration has the legal effect of canceling the borrower's debt and gives the non-borrower the amount of his stock, which represents all that he has paid in and the accumulated profits.

The premium spoken of above is the amount which the borrower pays in excess of the interest, or it may take the shape of a certain number of payments of dues or of interest to be made in advance. There are many premium plans, adopted by different associations, there being nearly 70 such plans relating to real estate loans now in vogue. If there be no demand for money from shareholders, some associations provide for loaning their funds to persons not shareholders, upon such terms and conditions as may be approved by their directors.

Every member of a building and loan association must be a stockholder; but the difference between a stockholder in such an association and that in an ordinary corporation for usual business purposes lies in the fact that in the latter the member or stockholder buys his stock, and pays for it at once, and usually is not called upon for any further payment. His profits, or the results of his investment in such stock, are derived through dividends, the value of the shares depending upon the successful operation of the business. They often go above par when the corporation is doing a profitable business, and the value often drops far below par when disasters come. In the building and loan association, on the contrary, the stockholder or member pays a stipulated minimum sum, say one dollar, when he takes his membership and buys a share of stock. He then continues to pay a like sum each month until the aggregate of sums paid, augmented by the profits, amounts to the maturing value of the stock, usually two hundred dollars, and at this time the stockholder is entitled to the full maturing value of the share, and surrenders the same. The capital of a building and loan association, therefore, consists of the combined savings of its members, paid to the association upon shares of stock, increased by the interest and premium which the association has received from loans made by it from the savings of its members thus paid to the association, and from all other sources of income. The amount of the capital of the association, therefore, increases from month to month and from year to year.

Shares are usually issued in series. When a second series is issued, the issue of the stock of the prior series ceases. Profits are distributed and losses apportioned before a new series issues. The term during which a series is open for subscription differs, but it usually extends over three or six months, and sometimes a year. Prior to the maturing of a share, it has two values. One is called the holding or book value, and the other the withdrawal value. The former is ascertained by adding all the dues that have been paid to the profits that have accrued; that is to say, the holding value is the actual value of a share at any particular time. The withdrawal value, on the contrary, is that amount which an association is willing to pay to a shareholder who desires to sever his connection with the association prior to the date at which his share will mature. Every association has full regulations on all such matters, as well as on matters pertaining to expenses, notice of withdrawal, and all the methods and processes necessary for the safe conduct of the business. The purchase of a share binds the shareholder to the necessity of keeping up his dues, and thus secures to him not only all the benefits of a savings bank, but the benefit of constantly accruing compounded interest. This accomplishes the first feature of the motive of a building and loan association. The second is that of enabling a man to borrow money for building purposes.

To illustrate the practical working of a building and loan association, we will suppose a man who has secured his lot wishes to borrow $1,000 for the erection of a house. He must be the holder of five shares in his association, each share having as its maturing value $200. His five shares, therefore, when matured, would be worth $1,000, the amount of money which he desires to borrow. The process by which he can borrow this money differs from that of borrowing money from savings and other moneyed institutions. In a building and loan association the money is put up at auction, usually in open meeting, on the night or at the time of the payment of dues. Those who wish to borrow bid a premium above the regular rate of interest charged, and the one who bids the highest premium is awarded the loan. The man who wishes to build his house, therefore, and desires to borrow $1,000, must have five shares of stock in the association, must bid the highest premium, and then the $1,000 will be loaned him. To secure this $1,000 he gives the association a mortgage on his property and pledges his five shares of stock. To cancel this debt he is constantly paying his monthly or semimonthly dues. until such time as the constant payment of dues, plus the accumulation of profits through compounded interest, matures the shares at $200 each. At this time, then, he surrenders his shares, and the debt upon his property is canceled. In this illustration it has been assumed that the maturing value of the shares is $200, although sometimes there is a variation from that amount. The distribution of profits is made on a variety of plans,

there being more than 25 different rules or methods for such distribution in practice among the associations. So, also, there are numerous plans or methods for withdrawals from associations; that is, shareholders are not, as a rule, required to continue the periodical payment of dues until the maturity of their shares, but may, if they so desire, cease paying such dues, and, if their shares are unpledged for loans, withdraw the amounts already paid in, subject to widely varying regulations. There are twelve or more rules for such withdrawals.

Associations of the kind described have existed in this country since about 1840, although the first one of the kind of which there is any record was organized at Frankford, a suburb of Philadelphia, Jan. 3, 1831. The decade of years from 1840 to 1850 must, however, be considered as being the real period for the permanent inception of such associations, although their great expansion has occurred within the last twenty years.

The latest official statistics of building and loan associations for the whole country are those published by the United States Department of Labor, and they bring the facts down to Jan. 1, 1893. At that time there were 5,838 building and loan associations in the country, and of these 5,146 were, at the time of the record, under 15 years of age. Building and loan associations, therefore, must be considered as entirely modern institutions. The total number of shareholders was 1,745,725. From all the evidence obtainable, women constitute about one fourth of the membership. The vastness of the business conducted by them is shown by the total dues paid in and the accrued profits, which, in the whole country, Jan. 1, 1893, amounted to $450,667,594. The total profits at the time named amounted to $80,664,116, and 314,755 homes had been acquired under the workings of the associations. Probably many more homes were acquired, because all associations did not feel free to give their full facts. The average size of the loans to home-builders was $1,120. The most careful estimates show that in the present year (1896) the total dues paid in and the accrued profits of the building and loan associations of the country amount to at least $600,000,000. When it is understood that a business represented by the large sum stated has been conducted quietly, with little or no advertising, and without the experienced banker in charge, the conclusion must be reached that the common people have shown themselves, in respect to these associations, as quite competent to take care of their savings. This conclusion is emphasized when it is known that but 35 of the associations in existence in 1893 showed a loss at the end of their previous fiscal year. This loss was small, being only $23,332.20 for the whole 35 losing associations.

Sometimes associations disband for want of business, or from some other cause; but when they disband, loss does not occur, because the whole business of the association consists of its loans, and the loans are, as a rule, to its own shareholders, who hold the securities in their associated forms. A disbanded association, therefore, simply returns to its own members their own property. Investment in a building and loan association is as nearly absolutely safe as possible, for the monthly dues and the accumulated profits, which constitute the active capital of the association, are loaned or "sold," as it is termed by the association, as fast as they accumulate, and are immediately loaned upon real estate or upon the stock of the association itself. The opportunities for embezzlement or for shrinkage of securities are reduced to the minimum.

The question as to whether the association method of obtaining money for the building of homes is more or less economical than that of obtaining it from the ordinary savings banks or through private money-lenders, is one on which men are not fully agreed. There are moral elements in the association method which, even if the cost to the borrower is somewhat increased, more than offset such increase.

These building and loan associations are very largely patronized and managed by wage-receivers, about 70 per cent of the whole number of members belonging to those who work for wages. The remainder, or about 30 per cent, consist of agents, bankers, brokers, corporation officials, government officials and employees, restaurant-keepers, merchants and dealers, professional men and women, superintendents, foremen, etc. It is safe to say, therefore, that the building and loan associations of the country are being used by the very classes for which they were originally established.

The associations are unevenly distributed over the country, as will be seen by the following statement:

| STATES AND TERRITORIES. | NUMBER. | STATES AND TERRITORIES. | NUMBER. |
|---|---|---|---|
| Alabama | 27 | Nebraska | 70 |
| Arizona | 4 | Nevada | 1 |
| Arkansas | 32 | New Hampshire | 17 |
| California | 133 | New Jersey | 288 |
| Colorado | 46 | New Mexico | 5 |
| Connecticut | 15 | New York | 418 |
| Delaware | 21 | North Carolina | 25 |
| District of Columbia | 29 | North Dakota | 6 |
| Florida | 23 | Ohio | 721 |
| Georgia | 43 | Oklahoma | 1 |
| Idaho | 4 | Oregon | 17 |
| Illinois | 669 | Pennsylvania | 1,079 |
| Indiana | 445 | Rhode Island | 6 |
| Iowa | 89 | South Carolina | 48 |
| Kansas | 72 | South Dakota | 17 |
| Kentucky | 148 | Tennessee | 78 |
| Louisiana | 28 | Texas | 41 |
| Maine | 29 | Utah | 6 |
| Maryland | 240 | Virginia | 83 |
| Massachusetts | 115 | Washington | 17 |
| Michigan | 75 | West Virginia | 56 |
| Minnesota | 97 | Wisconsin | 42 |
| Mississippi | 32 | Wyoming | 6 |
| Missouri | 366 | | |
| Montana | 8 | Total | 5,838 |

There are two classes of associations, known as "locals" and "nationals." Of the whole

number in the country, at the time named, 5,598 were locals and 240 nationals. Both, however, conduct their business under substantially the same method, but the local association confines its operations to a small field, usually to the town or county in which located, while the national operates on a large scale, extending its business enterprise far beyond the borders of its own state even. The national is ready to make loans on property anywhere, and sells its shares to any person, without reference to his residence. Some states have brought their building and loan associations under the same general supervision of law regulating savings banks, but in many nothing is officially known of the building and loan associations beyond the formalities of their incorporation.

For full information relating to building and loan associations, consult the following works: *Ninth Annual Report of the United States Commissioner of Labor; How to Manage Building Associations*, by Edmund Rigley, published in 1873; *A Treatise on Co-operative Savings and Loan Associations*, by Seymour Dexter, New York, 1891; and a *Treatise on Building Associations, Adapted to the Use of Lawyers and Officers*, by Charles N. Thompson, Chicago, 1892. CARROLL D. WRIGHT.

BUILDING-STONES. An increased knowledge of chemistry among architects and builders is having some effect upon wiser selections in the matter of stones for building purposes. There are many stones which present a beautiful appearance in the quarry, which, after a few months' exposure to the oxidizing influence of the atmosphere, bcome much blotched with discolorations and changes incident to the exposure. A granite containing particles of pyrite, for instance, is fit only for work out of sight, since it must sooner or later show traces of iron rust. Certain marbles, limestones and sandstones containing pyrite, protoxid or carbonate of iron are to be equally eschewed by the careful builder or contractor. Leading architects are now learning to particularize against such stones in making out specifications for ornamental buildings.

There is also an improvement of understanding as to the crushing strains which stonework will bear, and it is now recognized in many quarters that about all ordinary building-stones will stand much greater tests than the loads they are likely to carry, but that the thing to ascertain is, how they are likely to keep their strength for a hundred years or so. It was an improper conception on this point that caused the stone towers of the Niagara suspension bridge to require replacing a few years ago. They did not possess any elasticity, and began to break down under the repeated application and withdrawal of loads and strains. A tough, impervious, tenacious rock, like diabase, would have been the stone to use for such towers, instead of the impure magnesian limestone with seams of gypsum which went into the structure.

The breaking down of stonework is attributable more to the absorption of moisture, which remains until it freezes, than to any other cause, and builders are subjecting their stone to more tests for freezing and less for crushing. It is possible, in most quarries, to select stones that contain silicious cement, which so protects them that they are sure to last for ages. Where great durability is required, as in lighthouses, such stones should be used exclusively.

For the preservation of building-stones there are many trade preparations of more or less value. Paraffin dissolved in boiled oil, applied hot, has a tendency to fill the pores, and thus keep out water, but it decomposes, and requires renewal after a few years' time. Paraffin, sulphur and mineral oil also make a good water-proofing, though none of the preparations afford a permanent protection. Architects design all exposed stones with sloping surfaces to shed the water, yet there are few stone buildings that do not suffer in climates where freezing is common in winter. C. H. COCHRANE.

BUKKUR, a fortified island of the Indus, in Sind, between the towns of Rohri and Sukkur. The fortress occupies almost the whole island, but has now no military value.

BULAK, BOULAC, BOULAK OR BOULAQUE, the port of Cairo, situated on the Nile, about one mile northwest from that city, of which it forms a suburb. It contains the custom-house and warehouses of Cairo, a school of engineering, cotton, sugar and paper factories, the government printing-press, and the splendid and famous national museum of Egyptian antiquities, founded by AUGUSTE FRANÇOIS MARIETTE (q.v., Vol. XV, p. 542). In the latter are stored the results of extensive and systematic excavations, including, also, many of the historical relics brought to light by the agency of the Egyptian Exploration Fund. Population 1890, 20,000.

BULB, a shoot modified for vegetative reproduction. See BOTANY, Vol. IV, p. 99.

BULBUL, a Persian name for the nightingale, which was introduced into English poetry by Moore, Byron and others. In ornithology the name is given to a very different bird (*Pycnonotus hæmorrhous*), usually ranked among the babbling thrushes. It is a little bird of brilliant plumage, remarkable for its pugnacity. The name *bulbul* is also applied to several related forms.

BULFINCH, CHARLES, an American architect, was born Aug. 8, 1763, in Boston, Massachusetts; died there, April 15, 1844; descended on both sides from mercantile families; graduated at Harvard in 1781; studied his profession in Europe, and after the Revolutionary War began the practice of it in his native city, on which he impressed his architectural tastes; designed Faneuil Hall, the State House in Boston, the Charlestown State Prison, University Hall for Harvard, scores of churches, and the National Capitol at Washington, the construction of which he supervised for thirteen years. His work was all done in brick or stone, and is permeated with classical forms. See his *Life and Letters* (1896) by his granddaughter, and see ARCHITECTURE, in these Supplements.—

His son, STEPHEN GREENLEAF BULFINCH (1809-70), a graduate of Columbian University, Washington, District of Columbia, and of the Cambridge Divinity School, held Unitarian pastorates in Augusta, Georgia; Pittsburg, Pennsylvania; Washington, District of Columbia; and Boston, Massachusetts; enriched the hymnody of his denomination by compositions of his own, and wrote a number of devotional and apologetic books.

BULGARIA, a principality now incorporated with Eastern Roumelia and under the suzerainty of Turkey. Area, including that of South Bulgaria (East Roumelia), 37,860 square miles; population 1893, 3,309,816. More than 2,600,000 of the population belong to the orthodox Greek Church, which is the state religion. The capital is Sofia, a city of about 47,000 inhabitants. For early history and productions, see BULGARIA, Vol. IV, pp. 516, 517.

Bulgaria, made a principality by the treaty of Berlin, July 13, 1878, was to be governed by a prince elected by the national assembly (Sobranje), with a legislature and a constitution. Prince Alexander of Battenberg was elected sovereign, and at a meeting held in 1881 the Sobranje invested him with extraordinary powers, and authorized him to convoke, at the close of seven years, a Sobranje to form a revised constitution to be promulgated in 1888. The prince, however, was compelled to abdicate in 1886.

On July 7, 1887, Prince Ferdinand of Saxe-Coburg (born in Vienna in 1861, youngest son of Prince Augustus of Saxe-Coburg and Princess Clementina, daughter of Louis Philippe), was elected to fill the vacancy caused by the deposition of Prince Alexander. He accepted the position, and took the oath of office at Tirnova. At the time of his election he was an officer in the Austrian army. His sovereignty has not been recognized by the powers. Russia was strongly opposed to his incumbency, but has virtually withdrawn such objections. For his career, see FERDINAND I, in these Supplements.

The province of Eastern Roumelia, which received its autonomy in 1878, united itself with the principality of Bulgaria in 1885, and six months later Turkey agreed to the union. Bulgaria, which had previously paid no tribute, agreed in 1887 to pay $700,000 a year as the Roumelian contribution to Turkey.

The executive power is vested, under the prince, in a council of eight ministers,—Foreign Affairs, Interior, Public Instruction, Finance, Justice, War, Commerce and Public Works. The legislative authority is vested in a national assembly, or Sobranje, consisting of an upper and a lower chamber, or Great Sobranje and Ordinary Sobranje.

An electoral law, passed in 1882, established two grades of electors to the Sobranje. Those of the first degree included all persons holding public office, graduates, ecclesiastics, owners of real estate and their children, and persons practicing an independent calling, such as merchants, farmers, manufacturers, and employers of labor. Every 50 electors of the first degree were to nominate one of the second degree, and the men so nominated were to elect the deputies by *scrutin-de-liste* in the 13 (now 22) departments, but in 1893 the Great Sobranje modified the electoral laws so that the Ordinary Sobranje should be elected in the proportion of 1 to 20,000 of the population, while its own basis is 1 in 10,000. The term of both was also made five years. The revenues and expenditures of the government average about 100,000,000 leus ($20,000,000) each, yearly. The imports and exports are very nearly equal, and average about $18,000,000 yearly. In 1895 there were 520 miles of railway in Bulgaria, and about 3,000 miles of telegraph lines, the latter under government control. For language and literature of Bulgaria, see SLAVS, Vol. XXII, p. 149.

BULL, a ludicrous blunder in speech, implying some obvious absurdity or contradiction. The origin of the name is supposed to be due to the contrast, in papal bulls, between the assertion of excessive humility in the title, by which the pope styles himself "servant of servants," and his assumption of absolute supremacy and authority over the world. (See BULLS AND BRIEFS, Vol. IV, p. 519.) Bulls are commonly regarded as especially characteristic of the Irish. A bull has been cleverly defined by the witty Sydney Smith as "an apparent congruity and real incongruity of ideas suddenly discovered"; while Coleridge supplied as ingenious a definition, in "a bull consists in a mental juxtaposition of incongruous ideas, with a sensation, but without the sense of connection."—"India, my boy," said an Irish officer to a friend on his arrival at Calcutta, "is the finest climate under the sun; but a lot of young fellows come out here, and they eat and they drink, and they drink and *they die, and then they write home to their parents a lot of lies, and say it 's the climate that has killed them.*" Occasionally, the bull takes the form of verse, and is as bovine:

"*Had you seen those roads before they were made,*
You 'd have lift up your eyes and blessed General Wade,"

as an Irish ensign, in quarters at Fort William, Scotland, sang, in referring to the military roads of the Highlands and their maker, entirely and amusingly oblivious of the fact that roads before making were apt to be as invisible as the famous Spanish fleet, and for a similar reason.

BULL, GOLDEN. See GOLDEN BULL, Vol. X, p. 57.

BULL, JOHN, a generic name for an Englishman as a personification of what is supposed to be the English type, from Arbuthnot's use of the name in his *History of John Bull* (1712), reprinted complete in Pope's *Miscellanies* in 1728. The description of Bull is very similar to the familiar figure in the pages of *Punch*—a bluff, stout, red-faced, irascible rustic squire, in leather breeches and top boots, carrying a stout oaken cudgel in his hand, and with a bulldog at his heels.

BULL, OLE BORNEMANN, a remarkable Norwegian violin virtuoso; born in Bergen, Norway,

Feb. 5, 1810. At the age of five he began to show musical talent by his performances on the violin, and at nine years of age played as first violinist in the theater where his father was an actor. After unsatisfactory experiences with various teachers and schools, he went to Paris, where he was befriended by Madame Villeminot, and, under the patronage of the Duke of Montebello, procured means for a tour through Switzerland and Italy, giving concerts and stopping at Milan to study music. His first great success was achieved at Bologna; it was followed by a series of successful concerts in the principal cities of Italy, and he returned to Paris in 1835 with an established reputation. He subsequently visited London, the various countries of Europe, traveled through the United States, Canada and the West Indies, returning to Norway in 1848. In 1852 he paid a second visit to America, where he spent five years. He endeavored to found a Norwegian colony, "Oleana," in Potter County, Pennsylvania, but in this enterprise was not successful, as some land-swindlers sold him the property of a third party. He was, in consequence, involved in an expensive lawsuit, by which he lost the greater part of his capital. For several years he spent his winters in America and his summers in Europe. In 1854 he went to New York and engaged in business as an impresario for Italian opera, but disaster once more confronted him, and he resumed his musical tours to replace his loss. He resided for several years in Wisconsin, but finally returned to Bergen, where he died, Aug. 17, 1880. In the main he was a self-taught player. His individuality was so strongly marked as to leave but little room for the direct influence of a teacher. He has often been described as the "flaxen-haired Paganini," and was to a certain extent influenced by the great Italian. Ole Bull was a man of remarkable character, and an artist of undoubted genius. Tall, of athletic build, with large blue eyes and rich, flaxen hair, he was the very type of the Norseman, and the ruling passion of his life was the love he bore for his native land. The glorious scenery of the mountains and fiords of his home, the weird poetry of the Sagas of the Northland, imbued his sensitive childhood and filled his imagination. They were reflected in his style of playing, and gave to it that originality and poetic charm by which he never failed to captivate his audience. His technical proficiency was such as few violinists have ever attained. To the Norwegians his death came as the loss of a national hero. His biography was written by his second wife, Sara C. Bull, under the title of *Ole Bull: A Memoir*.



OLE BULL.

BULLA OR BUBBLE-SHELL, a genus of gasterpod mollusks, of the order *Tectibranchiata*, family *Bullidæ*. They have a convoluted and generally very thin shell. See MOLLUSCA, Vol. XVI, p 655.

BULLACE (*Prunus insititia*), a shrub or small tree, larger and much less spiny than the sloe, but very closely allied to it, as it is also to the plum, so that many botanists regard them all as one species. The fruit is larger than the sloe, generally globose, and is used like damsons. The bullace is a native of Asia Minor and southern Europe, but now common in hedges and coppices in England, and is sparingly naturalized in the United States. Bullace is a popular name of *Melicocca bijuga*, a common West Indian tree; in the United States it is given to the muscadine grape (*Vitis vulpinai*).

BULLÆ OR BLEBS are collections of serous fluid, situated immediately beneath the cuticle, and raising it from the true skin. They differ from vesicles only in being of larger size. The most familiar examples are the "blisters" produced on the hands by rowing, or the feet by walking. They are occasionally met with in many diseases of the skin, as eczema, erysipelas, etc.; but in pemphigus, and in some forms of hydroa, they constitute the chief feature of the disease.

BULL-BAITING, a barbarous sport once very popular in England. A number of dogs were set on to attack a bull, whose nose, that he might be made as furious as possible, was sometimes blown full of pepper before he was turned loose. Another form of the sport was to fasten the bull to a stake, by a rope some yards in length, and to set bulldogs on him, one at a time, which were trained to seize him by the nose, and when this was accomplished it was called "pinning the bull." But no small part of the enjoyment of the spectators was derived from the success with which the attacks of the dogs were met by the bull lowering his head to the ground, and receiving them on his horns, often tossing them to a great distance. King James I delighted in this sport. When the Czar Nicholas I of Russia visited England, before his accession to the empire, a boxing-match and a bull-baiting were got up to show him English tastes. Bear-baiting was as frequent and as fashionable until, with bull-baiting, it was declared illegal in 1835. See also BULL-FIGHT, in these Supplements.

BULLER, SIR REDVERS HENRY, an English cavalry commander of whose military career soldiers and critics predicted great things; entered the Thirtieth Regiment in 1858; served with the Rifle Brigade in the Chinese campaign of 1860; was in command of the First Battalion of the Red River expedition; on the staff of Field-Marshal Lord Wolseley (then Sir Garnet Wolseley) in the Ashantee war and march to Coomassie; served in the Kaffir war of 1878–79, and commanded the cavalry in the Zulu war, when he won the coveted decoration of the Victoria Cross for saving the lives of two fellow-officers and a soldier in one day, and at the risk of his own; was chief of staff to Sir Evelyn Wood in the Boer war; served in charge

of the intelligence department in the Egyptian war in 1882; was in command of the infantry brigade in the Soudan expedition of 1884, and from 1887 to 1890, was quartermaster-general of the army, and in October, 1890, was appointed adjutant-general and promoted to the rank of lieutenant-general. Dark and taciturn, but the beau-ideal of a soldier, Buller was always the idol of his men, and a cavalry officer of intrepid daring and considerable tact.

BULLET, the leaden projectile discharged from any kind of small arm. Case-shot or canister and shrapnel shell are also filled with spherical bullets hardened by the addition of antimony to the lead. See GUN-MAKING, Vol. XI, p. 282, and GUN-MAKING, in these Supplements.

The diameter of rifle-bullets has been decreasing ever since their introduction. Bullets are now made by means of a machine, which unwinds a leaden rod of the proper thickness, cuts it into the required length, and stamps the bullets into shape by means of steel dies, dropping them into a box when finished. Each machine can turn out 7,000 per hour, and one man can attend to four machines.

BULLET-TREE OR BULLY-TREE, sapotaceous trees of the West Indies and tropical America, valued for their wood, which is solid, heavy, close-grained and durable, and also, in some species, for the fruit. The bullet-tree of Guiana (*Mimusops globosa*) yields balata gum, a valuable substitute for India-rubber. Other fruit-bearing congeners are *Bumelia retusa*, the bastard bully-tree, and *Bumelia ingens*, the black bully-tree, while *Lucuma mammosa*, of which the fruit is called the marmalade, is sometimes called Jamaica bully-tree.

BULL-FIGHT, a brutal and degrading combat of men with bulls for the entertainment of the public, once common in Greece, particularly in Thessaly, and in Rome under the emperors, though in later times forbidden by both emperors and popes. It is still a favorite spectacle in Spain, Mexico and Spanish South America, being considered the national sport or pastime. Formerly the most magnificent bull-fights were instituted by the monarchs themselves; at present, both in the capital and in the larger towns of Spain, they are held either as speculations or for the benefit of public institutions. Every large town in Spain possesses a *Plaza de Toros*, and so do many towns in Spanish America; those of Madrid, Seville and Caceres are especially handsome. The bull-fighters, called *matadors* to distinguish them from the *picadors* and *banderilleros*, who exasperate the bull with lances and darts, are the idols of the lower classes, from whose ranks they are drawn. See also BULL-BAITING, in these Supplements.

BULLFROG. See FROG, Vol. IX, p. 797.

BULLHEAD, a small, coarse fish of the *Cottidæ* family, inhabiting brooks and backwaters, and mostly dwelling under stones in the bed of the stream. In England this fish is familiarly known as the miller's thumb, a name bestowed, like bullhead, on account of the tadpole-like disproportion of its head. See ICHTHYOLOGY, Vol. XII, p. 690.

BULLOCK, RUFUS BROWN, Georgia's reconstruction governor; born in Bethlehem, New York, March 28, 1834. For many years he was connected with the Adams Express business in the southern Atlantic states; he was active in extending telegraph and railroad lines and in the organization of the first national bank of Georgia. He was delegated to the convention which framed a new state constitution after the Civil War, and was elected governor of Georgia in 1868. During his term the reactionists in the legislature secured a majority, and the colored members were expelled from their seats; but the governor was enabled, through authority conferred by Congress, to reassemble the legislature and restore them to their rights. So strong, however, became the opposition to his policy, that in the fall of 1870 he resigned his office and retired to Atlanta, to devote himself to the transportation enterprises with which he was connected.

BULLOCK, WILLIAM A., an American inventor; born in Greenville, Green County, New York, in 1813; was a machinist, and published a newspaper; he invented a press to print his *Banner of the Union*, and constructed a planetary press for Frank Leslie; gradually improved this until he produced a self-feeding web press, with an automatic adjustment and delivery machinery, which turned out, cut and folded over 30,000 newspapers in an hour. He was fatally injured while setting up a press in Philadelphia, and died there, April 14, 1867.

BULLOCK PRESS. See PRESSES, in these Supplements.

BULL-ROARER, a provincial English name for a boy's plaything, made of a piece of wood about eight inches long and three broad, sharpened somewhat at the ends, to one end of which a string 30 inches or so in length is tied, then twisted tightly round the finger, when the whole is whirled rapidly round and round until a loud and peculiar whizzing noise is produced. An instrument of the same kind, called *turndun*, is still used by the native Australians to produce a sound warning off intruders during several religious mysteries. (See MYTHOLOGY, Vol. XVII, pp. 151, 152.) Mr. Andrew Lang has not only collected evidence of its similar use in New Mexico, New Zealand and South Africa, but identifies it with the *rhombos* used in the ancient Greek mysteries, itself an unconscious survival of more ancient and more savage mysteries. See "The Bull-Roarer," in Lang's *Custom and Myth* (1884).

BULL RUN, a small stream separating Fairfax and Prince William counties, in Virginia, about 25 miles W. by S. of Washington, and giving its name to a famous American battle-field, where two battles were fought during the Civil War, on July 21, 1861, and August 29, 1862. The first battle of Bull Run was memorable, not only because it was the first pitched battle of any magnitude in the Civil War, but because it gave decisive

evidence that the struggle was to be a severe one, instead, as was popularly supposed in the North, of an uprising that could be crushed in three months. The Confederate army, under Beauregard, with headquarters at Manassas, the junction of the Orange and Alexandria with the Manassas Gap railroad, consisted of the brigades of Holmes, Bonham, Ewell, D. R. Jones, Longstreet, Cocke and Early—three battalions of cavalry; six batteries of artillery—an aggregate force of about 23,000. Johnston's army of the Shenandoah, which was supposed to be held at Winchester by the army of General Patterson, near Harper's Ferry, but which, instead, came up by rail to reinforce Beauregard, consisted of the brigades of Jackson, Lee, Barstow and Kirby Smith, with five batteries, in all 8,340 men. The Confederates occupied a strong, defensive and partly fortified position on the south side of Bull Run, guarding all the fordings for eight miles, from Union Mills on the south to Stone Bridge on the north.

McDowell's army, which, under the pressure of popular demand, assumed the offensive, consisted of five divisions—Tyler's, Hunter's, Heintzelman's, Miles's and Runyon's—ten batteries; seven companies of cavalry—an aggregate of 35,000. Runyon's division (nine regiments) was left in the rear to guard the road to Alexandria. Nine of the batteries, eight companies of artillery and one small battalion of marines were regulars, all the rest were raw recruits, most of them three months' men, whose terms of enlistment were about to expire.

On the morning of the 18th of July, McDowell's forces were concentrated at Centerville, about 20 miles west of the Potomac and six miles east of Manassas Junction, Bull Run flowing about half way between. While McDowell was waiting at Centerville for the arrival of his provision-wagons, Tyler's division moved forward to Blackburn's Ford for the purpose of reconnoitering the passage toward Manassas. But meeting the fire of Longstreet's, Bonham's and Early's brigades, they became demoralized, and after a short firing, retired in disorder. This was known as the "Affair of Blackburn's Ford," but was alluded to by the Confederates as the battle of Bull Run; the subsequent battle of the 21st being named by them the battle of Manassas. McDowell's plan was to turn the Confederate left, force him from his defensive position, and, if possible, destroy the railroad leading to Richmond. He did not then know that these reinforcements were already arriving. He therefore ordered Tyler's division to threaten Stone Bridge, and by a vigorous demonstration divert attention from the turning column. Hunter's and Heintzelman's divisions were to move a few miles east of Stone Bridge, along Warrenton turnpike, cross the run at Sudley Springs and strike the flank and rear of the enemy. Several hours' delay in carrying out the orders gave the Confederates time to discover the movement. Tyler's attack at Stone Bridge was so feeble and ineffective, that Evans, who opposed him, concluded to leave but four companies, and march with the rest of his forces to aid the threatened "left." Near Sudley Springs he joined a part of Johnston's army, and soon after they were attacked and repulsed by the Federals under Burnside and Porter, but re-formed under cover of Jackson's brigade, which stood firm, and was likened by General Bee to a "stone wall," a soubriquet that ever after clung to Jackson. This occurred at 11:30 a.m., and McDowell at once sent orders to Tyler to "press the attack on Stone Bridge," but Tyler remained inactive. Meanwhile the Confederates concentrated their forces and occupied the high ground in the rear of their former defeat, and were then reinforced by fresh arrivals from the army of the Shenandoah. The Federal soldiers had been under arms since midnight, on a hot July day, yet, thus far, the battle was mainly in their favor. The tide was turned by the fatal mistake of the batteries of Griffin and Ricketts, which had been doing splendid execution. A regiment of infantry came out of the woods on Griffin's right, and he was about to open fire on it when some one said it was sent by Heintzelman to support the battery. A moment later the doubtful regiment poured forth a deadly volley that "cut down every cannoneer and a large number of horses." From that time on the Federal troops began to give way and the battle soon became a rout. The Confederate pursuit was soon arrested by a few volleys from the regulars, who covered the retreat, but a stream of disorganized men ran on until they reached their tents on the Potomac, giving the impression of a general stampede, although McDowell re-formed at Centerville and then retired, unpursued. Of the entire armies opposed, not over 18,000 men on either side were actually engaged. The losses on the Union side were: Killed, 444 men, 16 officers; wounded, 1,046 men, 78 officers; missing, 1,262 men, 50 officers; in all, 2,896. The Confederate losses were: Killed, 362 men, 25 officers; wounded, 1,519 men, 63 officers; missing, 12 men, 1 officer; a total of 1,982.

THE SECOND BATTLE OF BULL RUN was fought on the 29th and 30th of August, 1862, on the south side of Sudley road, north of which the battle of the same name, 13 months earlier, took place. It grew out of the operations of McClellan on the Virginia peninsula, below Richmond. When the army of the Potomac went to Yorktown, McDowell's division was detached and sent to Fredericksburg to keep Washington covered, and march thence overland to the support of McClellan, as his operations developed. Frémont, who soon gave place to Sigel and Banks, had considerable, but independent, commands in the Shenandoah valley, guarding that famous and easy route to Washington. About the middle of June, Stonewall Jackson, evading or brushing away the troops in that valley, made a threatening raid in force northward, drawing McDowell back toward the capital. The Federal government resolved to combine these three armies in one, and keep Jackson from reinforcing Lee and falling upon McClellan, who had already gotten

his army astride of the swollen Chickahominy Creek. John Pope was put in command, June 20th, but on that very day, Jackson, who had gotten quietly away, joined Lee in an attack on the part of McClellan's army north of the Chickahominy. It was a peremptory order that Pope should keep his command between Washington and Richmond, and he began to operate on lines of concentration, so that McClellan, whose defeat seemed assured, could fall back by way of Hanover Courthouse on his army, and he implored that McClellan should be ordered to do so, for he could not be responsible for the safety of his army "if its success was to depend on the co-operation of McClellan." Events on the peninsula soon settled this matter, for the beaten army of the Potomac was taken to Harrison's Landing, on the James River, where it could retire on no military force, and escape only by water. This left Pope to bear the whole brunt of the field until the army of the Potomac could be transported to Acquia Creek, and come up to his aid from the left and rear. Even this co-operation had to be enforced by placing Halleck in command of all the armies, and he sent peremptory instructions to McClellan to bring his troops to the succor of the army of Virginia by the way of Acquia Creek. Nevertheless, time sped away, and it was not until the 23d of August that the first troops from the James River reached Pope's army. Meanwhile Pope had withdrawn Sigel and Banks by the Luray Pass into Rappahannock County, and had brought McDowell in front of Warrenton, with a view of threatening Gordonsville and Charlottesville, commanding passes from Richmond into the Shenandoah valley. On the 9th of August, Banks, at Cedar Mountain, in Culpeper County, drove off a raid by Jackson, who retired to Gordonsville, where Longstreet was with his corps. It was now evident that Lee intended to advance by that route and crush Pope before the army of the Potomac could reinforce him. Under these circumstances Pope was ordered to hold the line of the Rappahannock, and to keep intact his communications with Fredericksburg, in order to receive McClellan's troops on his left. This left open a wide country between the mountains and Pope's right, and determined Lee's strategy, which was to turn that right and cut off the army of Virginia from Washington. On the 26th of August, Pope's line ran along the Orange and Alexandria railroad, and in front of Warrenton to Waterloo Bridge, on the Rappahannock. That night, Jackson, who had made a wide detour, broke through Thoroughfare Gap and advanced to Manassas station, plundering Pope's depot of supplies and capturing his correspondence. Now was the time to strike a telling blow which should isolate Jackson and destroy his organization, leaving the fast-uniting armies of the Union to handle Longstreet, for the two Confederate forces were separated by difficult passes. Pope saw the opportunity, but the celerity of Jackson and the slow concentration of his own troops caused his effort to fail. The movement to intercept Jackson, however, resulted in placing McDowell's corps a few miles in front of Manassas, and Pope's line extended thence to Warrenton Junction and along the Alexandria and Orange railroad, Porter being on the left and Banks well out upon the railroad, with instructions to fall back along its line, destroying it as he marched. On the 27th of August the whole army of the Potomac was in front of Washington, and Halleck was beseeching McClellan to send forward Sumner's and Franklin's five veteran corps, as a battle was impending. A march of from 16 to 20 miles would have placed these troops at the front, but they never arrived. Of the 90,000 brought from the James River, not one third came into battle, and of those who did, it was alleged that Fitz-John Porter kept over 10,000 inactive near Warrenton on the 29th, when a bloody contest was waged for the key to Pope's position, although this corps fought valiantly and well on the following day. For this dereliction of duty, which his commanding officer said was disobedience of orders, Porter was court-martialed and dismissed from the service; 25 years afterward, by act of Congress, he was restored by President Cleveland to his rank and pay on the retired list, public sentiment having changed as to his guilt. On the 29th the Confederate army was all up and in line before Thoroughfare Gap, through which it had debouched. The battle opened by an attack by Sigel on the right, near Groveton; Hooker and Kearny went in on his right, at Sudley Springs; Reynolds and Hooker carried the line across Warrenton pike; McDowell and Porter were ordered up from Manassas to support the attack begun at Groveton. McDowell obeyed, but Porter excused himself by saying that he could not move, on account of the large bodies of the enemy in his front. The object of the assault was to dislodge Jackson. It was known that Longstreet was to continue the Confederate right, marching east from Gainesville. These were the troops that Porter claimed confronted him, but in any event he did not attack them. At Sudley Springs, Kearny and other of Hooker's corps met with some success, forcing back Jackson's left and holding their advance. The battle raged all day until nine in the evening, and when firing ceased, victory leaned to neither side. The morning of the 30th passed quietly, but it became necessary for Pope to attack, or retire to replenish his supplies. At noon, having McDowell in the center, he ordered Hooker and Reno to assail Jackson's left, and Porter, supported by Sigel and Reynolds, to dislodge Longstreet. Porter was repulsed, but re-formed behind Reynolds, who was supported by troops taken from Hooker. Now followed a succession of furious assaults on Pope's right, and they ended in driving Hooker and Kearny back over a mile, leaving Sudley Ford open, through which the Confederates could move on the communications of the army of Virginia. Orders were given the Union troops to retire at the end of the contest, and they fell back on Centerville, where there were intrenchments, ammunition and provisions, which had been tardily sent forward.

Banks retired, destroying the railway, and the last day of August was passed in rest and distribution of supplies.

On the following day Jackson was detected in a movement to pass Pope's right toward his rear, and the Union commander sent forward Hooker, McDowell, Kearny and Reno to intercept it. The forces encountered at Chantilly, and in a pouring thunder-storm a severe action took place, in which the Union generals Kearny and I. I. Stevens were killed. Jackson's operations were thwarted, the roads to Alexandria were free from danger of molestation, and the armies under Pope took up their station in the fortifications about Washington, while Lee moved on to meet, soon after, a heavy catastrophe at Antietam.

No authentic records exist of the casualities or forces engaged. Approximately, Pope had 63,000 men in action, and Lee, 54,000. The Union troops lost 1,750 killed, 8,452 were wounded, and 4,300 missing; the Confederates lost 1,486 killed, 7,646 were wounded, but the missing were few.

D. O. KELLOGG.

BULLS AND BEARS. In the slang of the stock exchange, a "bull" is a person who seeks, artificially and unduly, to raise the price of stock, and speculates on a rise. On the other hand, a "bear" is one who speculates on a fall; who sells stock for delivery at a future date, in the hope that meanwhile prices will fall, so that he will buy at a lower price what he has sold at the higher price. See also ACCOUNT, Vol. I, p. 92.

BULL-TERRIER. See DOG, Vol. VII, p. 331.

BULL-TROUT, also called SALMON-TROUT and SEWEN, a name applied to certain species of the salmon genus, especially to *Salmo trutta* and *Salmo cambricus*. By anglers it is considered next to the salmon as a prize, and by many is mistaken for it. See SALMONIDÆ, Vol. XXI, p. 222.

BÜLOW, HANS GUIDO VON, the foremost pianist of that most advanced school of pianoforte-playing founded by Chopin and developed by Liszt; born at Dresden, Germany, Jan. 8, 1830. In early youth he seems to have shown neither talent for music nor delight in it; both talents appeared, and in a supreme degree, after a severe illness, and when he was under the care and tutelage of Clara Schumann's father, Friedrich Wieck. As a student at the University of Leipsic in 1848, Bülow studied jurisprudence, regarding music, in deference to his parents' wishes, as a diversion rather than as a study; at this time he first showed the influence of Liszt and Wagner, in defending their musical doctrines in a contribution to a democratic journal; then Liszt's performance of *Lohengrin*, at Weimar, in 1850, moved him so intensely that he at once discarded all ideas of a legal career, and at Zurich intrusted himself and his musical education to the hands of Wagner. In 1853 he made his first concert tour, and in 1854 he became Prussian court pianist, in 1864 pianist to the Bavarian court and head of a music school at Munich. In 1869 family troubles led him to resign his appointments and retire to Florence, and subsequently he undertook the great concert tours through which he became known in England and America. In 1880 he settled as director of music to the court of Meiningen. He was a brilliant pianist, remarkable for skill in conquering technical difficulties, and was famous as a concert director, and as a representative of the Liszt-Wagner school. He produced works for the piano and for orchestra, as also numerous editions of pieces by the great musicians, with arrangements and transcriptions from the works of Berlioz, Wagner and Liszt. While a pupil to Liszt, he married Cosima, Liszt's natural daughter. She deserted him in 1870, obtained a divorce and married RICHARD WAGNER (q.v., Vol. XXIV, p. 316). Von Bülow died Feb. 12, 1894. Among his compositions of greatest repute are *Overture to Julius Cæsar; Nirvana; Der Sänger's Fluch;* and *Il Carnevále di Milano.*



HANS VON BÜLOW.

BULRUSH (formerly sometimes written bull-rush), a name of very loose application, but commonly used in the United States for the tall reedy sedges (*Cyperaceæ*) of the marshes, notably of the large genus *Scirpus*. In Europe it is more commonly applied to the species of *Typha* which grow in similar localities, but are members of a very different family (*Typhaceæ*). In the United States *Typha* is known as "cattail" or "cattail-flag." The stems of *S. lacustris* and *S. pungens* are used for rush-bottomed chairs. The bulrush of Egypt is *Cyperus Papyrus*. The name *rush* has a much wider application, but "bulrush" is usually restricted as above.

BULWER, HENRY ERNEST GASCOIGNE, SIR, British statesman, was born 1836, and educated at Trinity College, Cambridge. Appointed official resident at the Ionian Isles in 1860; six years later, receiver-general of Trinidad. Next year he became administrator of Dominica. He acted as governor of Labuan from 1871 to 1875, when he went to Natal as lieutenant-governor, becoming governor in 1882. He was knighted the following year, and from 1885 to 1892 was Lord High Commissioner of Cyprus.

BULWER-CLAYTON TREATY. See DALLING AND BULWER, Vol. VI, p. 782.

BUMMALOTI. See BOMBAY DUCK, in these Supplements.

BUNBURY, HENRY WILLIAM, an English caricaturist; born at Mildenhall, in Suffolk, in 1750; died in 1811. Educated at Westminster and Cambridge, he early became distinguished for his humorous designs, which gave him the right to rank after Rowlandson and Gillray. He usually avoided political subjects. He drew mainly in pencil and chalks, but also produced water-colors. See also CARICATURE, Vol. V, p. 104.

BUNCE, OLIVER BELL author; born in New

York City, Feb. 8, 1828; died May 15, 1890. He was educated at the then famous Rand's Academy, of his native city, and became a bookseller and publisher. He was on the editorial staff of *Appleton's Journal* during its publication, and was a contributor to other periodicals. He is well known by his popular little book on manners, entitled *Don't.* His other writings are *A Bachelor's Story; The Romance of the Revolution; Life Before Him; Bensley; Bachelor Bluff; My House an Ideal; Timias Terrystone; Marco Bozzaris;* and *Love in '76.*

BUNCOMBE, EDWARD, soldier; born in St. Kitts, West Indies; died in Philadelphia, Pennsylvania, 1777. He was educated in England, but came to live in Tyrrell County, North Carolina. He fought, in the Revolutionary War, at Brandywine and at Germantown. In the latter battle he was wounded, captured, and died soon after from his wounds. A county of North Carolina was named for him in 1791. From this county and its Congressman came the phrase *buncombe*, used in the United States for mere bombastic speech-making, intended for the newspapers, without regard to the audience present. Bartlett quotes from Wheeler's *History of North Carolina:* "Several years ago, in Congress, the member for this district arose to address the House, without any extraordinary powers, in manner or matter, to interest the audience. Many members left the hall. Very naïvely he told those who remained that they might go too; he should speak for some time, but he was only '*talking for Buncombe.*'"

BUNDEHISH, the name of a religious book in the Pahlavi or Pehlevi language, which is one of the sources of information as to the Zoroastrian system of belief. There are translations by Justi (1868) and Westergaard (1879). See PAHLAVI, Vol. XVIII, p. 136.

BUNGALOW, the kind of house usually occupied by Europeans in the interior of India, and commonly provided for officers' quarters in cantonments. The bungalow is a one-storied thatched or tiled house, usually surrounded by a veranda; houses of masonry, with terraced roofs, are distinguished as *pucka-houses.* The name *bungalow* is a corruption of the native word *bangla*, "Bengalese," and probably refers to the first district where the form of building was noticed by Europeans. *Dak-bungalows* are houses for travelers, constructed at intervals of from 12 to 15 miles, on the highroads in many parts of India, and maintained by government. A rupee (about 40 cents), a day is charged for the use of these bungalows.

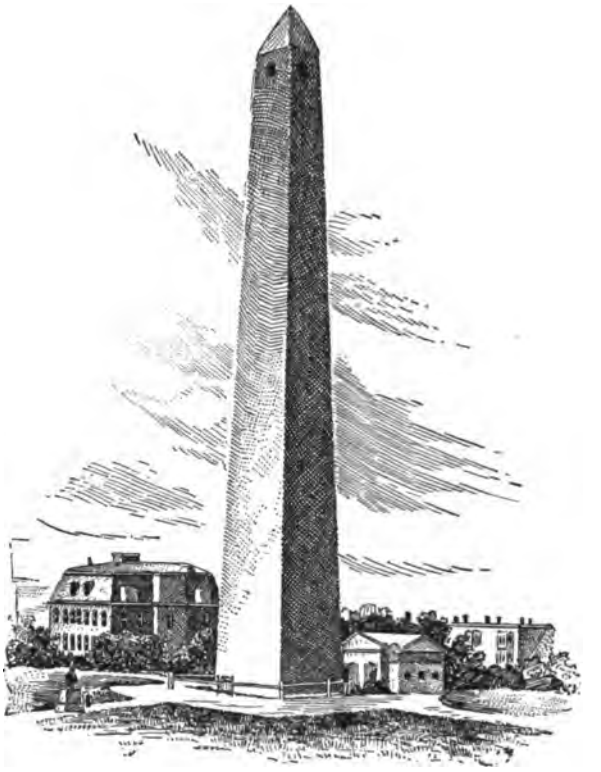
BUNGAY, an English market town, situated on the Waveney, six miles west of Beccles, and in the county of Suffolk. It grew up around the twelfth-century castle of the Bigods, earls of Norfolk, some ruins of which still remain; but the town is mostly of later date, having been rebuilt since the great fire of 1688. It has a large printing establishment, and considerable trade in corn, malt, flour, coals and lime. Population 1890, 3,579.

BUNGE EXPEDITION. See POLAR EXPLORATIONS, in these Supplements.

BUNIAS, a small genus of *Cruciferæ.* The leaves of *Bunias orientalis* are eaten in Russia, and are used in western Europe as fodder. The leaves and root of *Bunias erucago* are eaten in Greece.

BUNKARA OR BLUE RIVER, one of Colorado's numerous rivers, which, rising near South Park, in the Rocky Mountains, joins the Grand River about 20 miles W. of Hot Sulphur Springs, after a course of 100 miles.

BUNKER HILL, THE BATTLE OF. Memorable in American history for its many consequences, this first pitched fight of the Revolutionary War



BUNKER HILL MONUMENT.

took place as briefly described under BUNKER HILL, Vol. IV, p. 521, and BOSTON, Vol. IV, p. 72. From an American standpoint it is worthy of more detailed consideration. In military results it led to the investment of Boston by the patriot soldiery, and later compelled the British to evacuate the city. Technically a defeat, its moral influences were of the utmost value. It showed that the colonial militia could effectively confront disciplined European troops; it broke the prestige of invincibility that had belonged to the British soldiery; it put an end to all thought of compromise; it invigorated the union of the colonies by making success seem probable to American arms. The barren honor of victory was purchased by the British with the loss of 70 officers and 984 men, but it was a Pyrrhic victory.

The name of the battle is a misnomer. It was fought on Breed's Hill, an elevation behind Charlestown, some 2,000 feet southwest of the higher elevation which has given its name to the battle.

After the minute-men of Lexington and Concord had harried the British soldiery within gunshot of their fleet, the patriots speedily set about the investment of Boston. The troops of Massachusetts, Connecticut, New Hampshire and Rhode Island flocked to the camp at Cambridge and the outposts around Boston, with fowling-pieces, powder-horns and shot-pouches, but without commissariat or military stores. They reported, if they chose, to General Artemas Ward at Cambridge, in command by the orders of the Massachusetts Committee of Public Safety.

Word reached the camp at Cambridge that General Gage, commanding the British troops in Boston, had decided to seize and fortify the heights around Charlestown on June 18th. The Massachusetts Council of War decided to forestall the movement, and sent Colonel William Prescott with 1,000 militiamen to seize Bunker Hill and throw up defensive earthworks. He moved from Cambridge under cover of the night, crossed the causeway, and, mistaking his orders, constructed a redoubt on the top of Breed's Hill. With the dawn of June 17th commenced a heavy bombardment from the British fleet in the Charles River, and Gage, furious at the defeat of his plans, ordered an assault on the works by 2,500 regulars, under Generals Howe and Pigot. The British columns were ferried over and formed for the attack. Fatigued by night-marching and the most arduous of military duties—intrenching-work—1,500 patriots awaited the attack. Reserving their fire until they could see the whites of the eyes in the advancing column, Prescott's men fired with such precision that the front ranks of the regulars melted away. Twice were assaults delivered with the same result. Then Clinton crossed the Charles River with reinforcements for the British, and Prescott reluctantly gave orders to his men to retire. But 50 bayonets and a stray charge of powder here and there were in the hands of the defenders of Breed's Hill. Retiring in good order, covered by the troops of Stark, Putnam and Knowlton, the American army crossed the neck of land leading to Cambridge, under fire of the fleet, and with a total loss of 145 killed and missing and 304 wounded, and occupied Putnam's lines on Prospect Hill. Pursuit there was none.

The battle is commemorated by a granite monument 221 feet in height, standing on the site of the redoubt, and now within the corporate limits of the city of Boston. Lafayette laid the corner-stone on the fiftieth anniversary of the battle and 18 years later the shaft was dedicated. On each occasion Daniel Webster was the orator of the day.

BUNNER, Henry Cuyler, an American author and journalist, best known for his sprightly humor in the pages of *Puck;* born at Oswego, New York, Aug. 3, 1855; he was destined for commercial life, until an experience on the staff of the New York *World* disclosed his mission in life. He entered journalism in 1873 as a member of the staff of the *Arcadian*, a paper which was discontinued in 1877, when Mr. Bunner became assistant editor of *Puck*, then in its infancy. Soon afterward he was made editor, succeeding Sydney Rosenfeld, the playwright. His short stories were models of humor and delicacy, and up to the day of his death were one of the chief features of his humorous publication. Besides his constant contributions to *Puck*, and frequent articles for magazines, he was a successful writer of fiction, wrote some verse and occasionally lectured. Among his novels are *A Woman of Honor* (1883), followed the next year by *Airs from Arcady*, a collection of poems, and in 1892 a second collection of verse entitled *Rowen*. His story *Midge*, and also *The Story of a New York House*, were popular novels. He died in Nutley, New Jersey, May 11, 1896.



HENRY C. BUNNER.

BUNSEN, Robert Wilhelm, a distinguished German chemist; born at Göttingen, March 31, 1811. He studied zoölogy, chemistry and physics at the university of his native town, and at Paris, Berlin and Vienna. He filled the chair of chemistry in succession at Marburg, at Breslau, and from 1852 at Heidelberg. He invented the charcoal pile and the burner which bear his name; discovered that the hydrate of oxid of iron is an antidote to arsenic; was the first to produce magnesium in large quantities, and in 1860 invented the magnesium light, which has proved so important to photography. The greatest discovery with which his name is associated is that of the spectrum analysis, made in conjunction with Kirchoff, which has been the means of working wonders in chemistry and revealing much to astronomers. Besides his original work in chemistry, Bunsen proved himself a most successful teacher, and his laboratory is still a favorite resort for Americans studying chemistry in Europe. His writings on physics and geology, as well as on chemistry, are numerous.

BUNSEN CELL. See Electricity, § 101, in these Supplements.

BUNSEN BURNER, a gas-burner named for its inventor, the distinguished German chemist. By this invention the gas, just previous to burning, is largely diluted with air, thus producing a non-luminous and very hot flame. Probably no other invention has done so much to facilitate work in the chemical labratory, and has been adapted for use in connection with a variety of small furnaces, and in many forms of gas-stoves. See Chemistry, Vol. V, p. 545.

BUNT, a parasitic disease of cereals, due in Europe to *Tilletia caries*, a mold belonging to the *Ustilagineæ*. The common smut of wheat and corn in the United States is *Ustilago carbo*, and is not called bunt.

BUNTER SANDSTEIN or VARIEGATED

SANDSTONE, the German name for the New Red Sandstone. It is the lowest portion of the Triassic system. See GEOLOGY, Vol. X, p. 352.

BUOL-SCHAUENSTEIN, KARL FERDINAND, COUNT, an Austrian statesman, born May 17, 1797; died Oct. 28, 1865. He was minister in succession at Karlsruhe, Stuttgart, Turin and St. Petersburg. He was second Austrian plenipotentiary at the Dresden Conference (1850), after which he was minister at London, until the death of Schwarzenberg recalled him to Vienna, to hold the portfolio of foreign affairs. He presided at the Vienna Conference in 1855, and represented Austria at the Congress of Paris.

BUOYS. The United States buoy service is maintained at a cost of about $350,000 a year, and has the care of about 5,000 buoys, located in the principal harbors of the country. They require replacing quite frequently, especially in the Northern states, where the ice is most destructive. The harbor of New York has been swept clean of iron buoys twice in one winter. Within recent years there has been an increased use of wire rope for mooring buoys, its greater strength enabling buoys to be placed more advantageously in deeper water than was previously practicable.

The installation of electric buoys in Gedney's channel, New York harbor, has been a pronounced success, though at first much difficulty was experienced in keeping them lighted in bad weather. The incandescent lights are of 100 candle-power each, and are attached to 50-foot cedar buoys, anchored with 5,000-pound weights. They are connected with the lighting-station on shore by a cable of copper, insulated with gutta-percha, and sheathed with hard-drawn copper wires. The current maintained is 1,000 volts, and the cable is six and a half miles long. The electric plant is built in duplicate, so that no failure can readily occur. It is 2,000 feet from the beach, the cable being carried on shore in a four-foot lead-covered subway. Gedney's channel crosses a bar in the harbor, and is about 1,000 feet wide. Since the electric buoys were installed, the great ocean steamers are able to pass into the harbor at night, having been previously obliged to lie outside, waiting for daylight, on the occasions when they reached the port during the night. A tender is kept ready for duty at all times to replace damaged lights, which at first were of frequent occurrence, but are now more rare, owing to improved appliances.

An electric life-buoy has been invented and introduced in Germany, that may be thrown overboard to aid drowning men. It has storage-battery accumulators, and will furnish light for six hours. Incandescent lamps are used of a power visible at 2,000 yards' distance.

C. H. COCHRANE.

BUPRESTIS, a genius of beetles, typical of the large family *Buprestidæ*, or metallic beetles. Those occurring in warmer countries are conspicuous for bright color and metallic sheen. Some of them are popularly known as *golden beetles*. The elytra, or upper wings, of several species are used by jewelers in the manufacture of ornaments. *Buprestis gigas*, found in Cayenne, is about two inches long. Some small species occur in England. *Buprestis rufipes* is a North American species. See COLEOPTERA, Vol. VI, p. 132.

BUR, in engraving, a slight ridge of metal raised on the edges of a line by the burin, the rocker, or the dry-point. It produces an effect like a smear, and is therefore usually regarded as a defect, and scraped off. Some etchers, however, take advantage of it to deepen their shadows; in mezzotint-engraving the whole effect comes from the bur, which is untouched in the deep shades and more or less burnished away in the light. As the bur soon wears off, in valuable old proofs its presence is strong evidence of the early date of an impression.

BURANO, an island and town of northern Italy, 5 miles N.E. of Venice, and celebrated for its school for the designing and making of fine laces. See LACE, Vol. XIV, pp. 185, 187. Population 1890, 4,492.

BURBAGE, RICHARD, an English actor; born about 1567; the son of James Burbage, himself an actor and the builder of the Shoreditch and Blackfriars theatres (see SHAKESPEARE, Vol. XXI, pp. 760, 761.) Richard, who commenced acting while very young, had by 1588 earned considerable reputation, and during the next 10 years outstripped all competitors. On the death of his father in 1597, he became part owner of the Blackfriars Theatre; and two years later, in conjunction with his brother, pulled down the Shoreditch house, replacing it with the famous Globe Theatre as a summer playhouse, while Blackfriars became exclusively a winter house. To cover the expense, Burbage took as partners in his undertaking Shakespeare, Hemming, Condell and others. At one or other of these two theatres Burbage gained his greatest triumphs, and took the leading part in new plays until his death in 1618.

BURBOT, a fish of the genus *Lota*, the only fresh-water fish of the cod family (*Gadinæ*) found in northern regions of America, Asia and Europe. It is called cusk, eel-pout, or fresh-water cod in the United States. Some specimens attain a length of six feet and a weight of 50 pounds. In some regions it is considered an excellent food-fish.

BURCHARD, SAMUEL DICKINSON, born in Steuben, New York, Sept. 6, 1812. He became pastor of a Presbyterian church in New York City in 1839. At a ministers' meeting during the Presidential campaign of 1884, he referred to the Democratic party as the party of "Rum, Romanism and Rebellion." The alliterative sentence was quickly picked up by the press, and is thought to have turned the tide which resulted in the election of the Democratic candidate. He died in Saratoga, New York, Sept. 25, 1891.

BURCKHARDT, JACQUES, a Swiss historian; born at Basel, May 25, 1848; studied theology in his native town, and later took a course at the University of Berlin; returning to Switzerland, he

was appointed to the chair of general and art history in the University of Basel; his works were numerous and include *The Art Treasures of Belgium* (1842); *Life and Times of Constantine* (1853); *The Renaissance in Italy* (1867); and similar works.

BURDEKIN, a river of Queensland, Australia, draining the district of North Kennedy. It rises not far from the coast, and, after an irregular course, forms a delta emptying into Bowling Green and Upstart bays. It was discovered by Leichhardt in 1845, and explored by Dalrymple and Smith, 1859–60. See QUEENSLAND, Vol. XX, p. 171.

BURDEN, HENRY, inventor; born in Dumblane, Scotland, April 20, 1791; died in Troy, New York, Jan. 19, 1871. While a lad on his father's farm, he showed his inventive genius by making labor-saving machinery. A thrashing-machine was his first successful invention. He pursued a course of scientific studies in Edinburgh, and in 1819 came to America. In 1822 he was connected with the Troy Iron and Nail Factory as agent, but ultimately became sole proprietor of the works. He invented agricultural implements. He made an improved plow, the first cultivator, then a machine for making horseshoes, and one for the manufacture of hook-headed track-spikes, such as are now used by nearly all American railroads. Previous to this these spikes had to be made by hand, and his invention gave a new impulse to railroad-building.

BURDEN OF PROOF, in legal procedure, signifies the obligation to establish by evidence certain disputed facts; and, as a general rule, this burden lies on the party asserting the affirmative of the issue to be tried or question in dispute or on the party against whom judgment would be given, according to the presumption recognized by the law of evidence if no proof were adduced on either side. Accordingly, it almost always rests on the plaintiff in an action, or on the party asserting the facts on which the result of the litigation must depend. There may, however, be such a legal presumption in favor of the plaintiff that the burden falls on the defendant. The burden of proof is said to be shifted when the party upon whom it lay has produced sufficient evidence to turn the presumption in his favor. Should the evidence produced at the trial of a case be equally balanced, as where only one witness testifies to a fact and another contradicts him, if both witnesses are apparently entitled to the same degree of credibility the party on whom the burden of proof rests must be defeated, for he must establish his case by evidence of greater weight than that offered against him. The weight of evidence does not necessarily refer to the number of witnesses, but rather to the value of the evidence, after considering the character and apparent truthfulness of the witnesses. In criminal cases the burden of proof is, throughout the proceeding, upon the prosecution, and the establishment of a *prima facie* case will not shift the burden to the defendant. In such cases the evidence must be such as will overcome all reasonable doubt of the guilt of the accused before a conviction will be proper. But if the defendant claims insanity as a defense, the burden, in most states, rests upon him to establish it, on the principle that every person is presumed to be sane until the contrary is shown.

BURDETT-COUTTS, ANGELA GEORGIANA, BARONESS, an English philanthropist, daughter of Sir Francis Burdett; born April 21, 1814. In 1837 she inherited much of the property of her grandfather, Thomas Coutts (q.v., Vol. VI, p. 529), and took his name. The liberal and philanthropic use she made of this wealth has rendered her name popular. Among her charities may be mentioned the erection and endowment of several churches and schools, and the endowment of the three colonial bishoprics of Cape Town, Adelaide, and British Columbia; the establishlishment of a shelter and reformatory for fallen women, and the erection of Columbia Square, consisting of model dwellings, at low rents, for about 300 families. Her private charities have been on a corresponding scale, and she is also a patroness of art. In 1871 she accepted a peerage from government. In 1872 the freedom of the city of London was conferred upon her; in 1874 that, also, of Edinburgh. In 1881 she was married to Mr. William Lehman Ashmead-Bartlett (born in New Brunswick, New Jersey, in 1851), who, in 1882, obtained the royal license to assume her name, and who, in 1885, was elected to Parliament as Conservative member for Westminster.



BARONESS BURDETT-COUTTS.

BURDETTE, ROBERT JONES, humorist and lecturer; born in Greensboro, Pennsylvania, July 30, 1844. He was educated in the public schools of Peoria, Illinois, and in 1862 enlisted as a private in the Forty-seventh Illinois volunteers, and served through the war. He was connected with the Peoria *Transcript* in 1869, afterward with the *Review*, and later he started, with friends, a new paper, which was unsuccessful. He became associate editor of the Burlington *Hawkeye*, of Iowa, and his humorous sketches in this paper were widely copied, and made him known to the newspaper-reading world. His fun was never coarse or vulgar. In 1877 he began to deliver lectures, which were only moderately successful, and most of which have since been compiled with fugitive pieces and published in book-form; as, *The Rise and Fall of the Mustache, and Other Hawkeyetems; Hawkeyes;* and *Life of William Penn.* He was licensed by the Baptist denomination to preach, and during vacation trips supplied destitute country churches.

BURDOCK, the common name of *Arctium Lappa* (*Lappa officinalis*), a genus of the family *Compositæ*, characterized by the bracts of the

involucre, which are abruptly hooked at the tip. By means of these hooks the flower-head, popularly called a *bur*, readily adheres to clothing, the wool of sheep, or the like, and in this way the seeds are transported from one place to another. It is a native of the Old World, but is widely naturalized in America. The root is a diaphoretic and diuretic, and is used as a remedy for rheumatism, cutaneous diseases, etc. The young shoots are cultivated in Japan for culinary purposes. See THISTLE, Vol. XXIII, p. 307.

BUREAU OF THE AMERICAN REPUBLICS, THE, a bureau of the Department of State, established upon the recommendation of the Pan-American Conference held at Washington in 1889, under the presidency of the late James G. Blaine, Secretary of State. Its objects are the collection and distribution of commercial information concerning the American republics. It has published a series of useful handbooks of these countries, with their tariffs reduced to United States equivalents, commercial directories and bulletins as to the land, patent and mining laws. A monthly bulletin is also issued, giving the latest information as to resources, commerce, political and general features. The bureau is sustained by contributions from the several American republics, in proportion to their population.

BUREAU VERITAS OR THE FRENCH LLOYD'S, a Belgian institution for the classification of vessels, on principles similar to Lloyd's (q.v., Vol. XIV, p. 741). It was founded at Antwerp in 1828, in 1830 removed to Paris, whence, in 1870, it returned to its present location at Brussels. It has suboffices in every principal seaport.

BURGAS, a port of eastern Roumelia, situated on the Gulf of Burgas, 76 miles N.E. of Adrianople. It has a trade in agricultural produce, and sends large quantities of clay to the Turkish pipe-makers. Population, 5,000.

BURGAW, the county seat of Pender County, in the southeastern or sea-coast portion of North Carolina. It is situated in the tar and turpentine district of extensive pine forests, and is also the center of some agricultural industry. It has a station on the Wilmington railroad, west of the Cape Fear River, and is 20 miles N. of Wilmington. Population 1890, 366.

BURGESS, EDWARD, naval architect; born at West Sandwich, Massachusetts, June 30, 1848. He was a Harvard graduate, and afterward instructor at that college, in the entomological department. He spent some time traveling in Europe, began the study of naval architecture, and engaged in building boats. He was the builder of the yachts *Puritan* and *Mayflower*, which, in the international races of 1885 and 1886, won, respectively, the races with the English *Genesta* and *Galatea*. He died in 1891.

BURGESS, GEORGE, a Protestant Episcopal bishop and hymn-writer; born at Providence, Rhode Island, Oct. 31, 1809; educated at Brown University and in Germany; rector of Christ Church, Hartford, Connecticut, for 13 years from 1834; in 1847 consecrated bishop of Maine. He died of apoplexy, April 23, 1866, in the island of Haiti, whither he had gone to found a mission. His works include *Pages from the Ecclesiastical History of New England* (1847), a volume of sermons, several hymns, and an excellent metrical version of the psalms.

BURGHER AND ANTIBURGHER. See UNITED PRESBYTERIAN CHURCH, Vol. XXIII, p. 728.

BURGHLEY OR BURLEIGH, LORD. See CECIL, WILLIAM, Vol. V, p. 283.

BURGLARY. In the United States, the common-law definition of burglary has been somewhat modified by statute. The laws of the different states adhere, in general, to the principles of the common law, but vary widely in detail, both as to the crime itself and its penalty. The term *burglary*, throughout the United States, is now generally extended to the crime of house-breaking by day as well as night. It is also generally applicable, by statute, to the crime of breaking into stores and other buildings as well as dwelling-houses. It requires only the slightest use of force in breaking into a house to answer the requirement of breaking, and in most states the opening of a door or window will be sufficient, or even the breaking out of the house after entering, for the purpose of committing a felony. It matters not that no property be taken, if the intent was to commit a felony. The punishment for this crime is severe and is fixed by statute. See BURGLARY, Vol. IV, p. 534.

BURGLEN, a village of Switzerland, situated in the canton of Uri, about a mile from Altorf. It is the traditional birthplace of William Tell. The supposed site of the patriot's house is now occupied by a chapel, erected in 1522, upon the walls of which are represented certain well-known scenes from his history.

BURGOMASTER, the Anglicized form of the Dutch *burgemeester* (German, *bürgermeister*), the title of the chief magistrate of a municipal town in the Netherlands, Germany, and other Teutonic countries. It is analogous to the French *maire*, English *mayor*, and Scotch *provost*. The German governments usually retain the right to confirm or reject the elected burgomaster. For the origin of the term, see HOLLAND, Vol. XII, p. 72.

BURGOMASTER, the great ice-gull (*Larus glaucus*), found in the arctic regions of both hemispheres. It is a tyrant among the small water-birds; hence the name.

BURGON, JOHN WILLIAM, an English divine, dean of Chichester and a voluminous writer; born in Smyrna, Asia Minor, Aug. 21, 1813; educated at Oxford University, where he wrote the Newdigate prize poem in 1845; became a fellow of Oriel College; Gresham lecturer in divinity and vicar of St. Mary the Virgin, Oxford; was appointed dean of Chichester in 1876. Dean Burgon's works include *Life and Times of Sir Thomas Gresham* (1839); *Oxford Reformers* (1854); *A Plain Commentary on the Four Holy Gospels* (8 vols., 1855); *The Book of Psalms* (1857). He died at

Chichester, Aug. 6, 1888. His biography, by E. M. Goulburn, was published in London (1892).

BURGUNDY PITCH, a resinous substance prepared from common frankincense (q.v., Vol. IX, p. 711) by melting it in hot water, by which means it is freed from a considerable part of the volatile oil which it contains. See FIR, Vol. IX, p. 223.

BURGUNDY WINES, a class of wines produced in Burgundy, in France, chiefly the produce of vineyards cultivated on the hilly lands forming the Côte-d'Or (see WINE, Vol. XXIV, p. 606). They share with the Bordeaux wines the reputation of including the finest wines made.

BURI, in Norse mythology the first of the gods, and father of Bör, who was the father of Odin.

BURI, the native name of *Arenga saccharifera*, a useful palm of the Philippines. Like many palms, all of its parts are put to various uses, but it is chiefly distinguished by its yield of sugary sap, known as "palm wine." The sap is obtained either by cutting off the young flower clusters or by perforating the stem before the plant flowers. The spirituous liquor known as "arrack" is distilled from the sap of this palm and others which yield sugar, as species of *Mauritia*, *Borassus*, etc.

BURIAL SOCIETIES. See FRIENDLY SOCIETIES, Vol. IX, p. 780.

BURIN, the principal instrument used in engraving. It is made of tempered steel, and is of prismatic form, the graving end being ground off obliquely to a sharp point. The distinctive style of a master is frequently described by such expressions as a soft burin, a graphic burin, or a brilliant burin. See ENGRAVING, Vol. VIII, p. 439.

BURION, a name given to the house-finch (*Carpodacus frontalis*), a bird of the sparrow family (*Fringillidæ*), common in the southwestern United States.

BURITI is the native name applied to one of the large sugar-yielding palms of South America (*Mauritia vinifera*). It occurs in great forests in the region of the Amazons, and yields an abundance of "palm wine," as its specific name indicates, and as described under BURI (q.v.).

BURKE, JOHN, an English genealogist; born in County Tipperary in 1786; settled in London and founded a family of industrious genealogists and heralds; he published *A Dictionary of the Peerage and Baronetage of Great Britain* in 1826. He died at Aix-la-Chapelle, Prussia, March 27, 1848.—His second son, SIR JOHN BERNARD BURKE, was born in London in 1815; educated in the College of Caen, in Normandy, and was called of the Middle Temple in 1839. He edited his father's works for many years; wrote many popular works on genealogy, heraldry and the vicissitudes of noble families; was appointed Ulster King of Arms for Ireland in 1853 and knighted the following year; he became keeper of the Irish state papers in 1874, and died in Dublin, Ireland, Dec. 13, 1892. He did much to popularize heraldry, the principal fault of his works being the inclusion, at the instance of parvenu noblemen, of "Philadelphia pedigrees" incapable of proof and deduced from mythical personages.—His sons, HENRY FARNHAM BURKE as Somerset Herald in England, and JOHN E. BURKE as Athlone Pursuivant in the Irish Office of Arms, have continued the publication of their father's popular works.

BURKE, THOMAS N. (Father Tom); born in Galway, Sept. 8, 1830; died in Dublin, July 2, 1883. He became a Dominican friar, and in 1881 lectured through the United States in answer to J. A. Froude's criticisms on Ireland. He was a man of scholarship and impassioned eloquence.

BURKE, WILLIAM, born in 1792; became notorious through his partnership with William Hare in a series of infamous murders committed in Edinburgh. Toward the close of 1827 they sold for dissection, to Dr. Robert Knox, the body of an old pensioner who had died in their house, and the ease and safety with which they had obtained this money tempted them to commit murder to procure more bodies. They inveigled unknown travelers into a lodging-house, made them drunk, and then suffocated them in such a way as to leave no marks of violence, receiving for the bodies sums of money varying from $40 to $70. They had murdered 15 persons in this way when they were discovered by the police. Hare, the more execrable wretch of the two, was admitted king's evidence, while Burke was hanged, Jan. 28, 1829. His abhorred name has added a word to the English tongue: *burke*, to smother; to get rid of by indirect means.

BURKESVILLE, a town of southern Kentucky, and the county seat of Cumberland County. It is situated on the Cumberland River, 65 miles E.S.E. of Bowling Green, near Glasgow railroad station, on the Louisville and Nashville railroad. It is an agricultural and oil district, has a newspaper, and a line of steamboats to Nashville. Population 1890, 750.

BURLEIGH, WILLIAM HENRY, born in Woodstock, Connecticut, Feb. 2, 1812; died in Brooklyn, New York, March 18, 1871. He early entered a printing-office, where he learned type-setting and wrote for the press. From 1832 to 1835 he was in charge of newspapers which advocated reforms. His principles were in favor of peace and temperance, and against slavery. He was more than once the object of mob-violence. He was editor of the *Prohibitionist*. In 1855 he became harbor-master of the New York port, which office he held for 15 years. A collection of his poems which had appeared in his newspapers was published in book-form.—His wife, CELIA, was born in Cazenovia, New York, in 1825; died in Syracuse, July 26, 1875. Mr. Burleigh was her third husband, she having been divorced from C. B. Kellum, and later from Charles Chauncey Burr. After Mr. Burleigh's death she studied theology, entered the Unitarian ministry, and was pastor of a church in Brooklyn, Connecticut, till her health failed.

BURLINGAME, ANSON, an American statesman; born in New Berlin, New York, Nov. 14, 1820; died at St. Petersburg, Russia, Feb. 23,

1870. He graduated at Harvard law school in 1846, practiced law in Boston, and was elected to the legislature. In 1854 he was sent to Congress, where he became known as an able debater and an opponent of slavery. For his severe denunciation of Brooks's assault on Sumner he was challenged to fight a duel. (See BROOKS, PRESTON S., in these Supplements.) In March, 1861, Burlingame was nominated minister to Austria, but the government of the empire refused to receive him. President Lincoln sent him to China in 1861 as United States minister, and at the expiration of his term Prince Kung, regent of the empire, appointed him special envoy to the United States and the principal European powers to make an amicable treaty with those nations—an honor never before conferred upon a foreigner. In 1868 the "Burlingame Treaty" was signed at Washington, being the first official acceptance, on the part of China, of the principles of international law. Mr. Burlingame then visited England, Denmark, Sweden, Holland and Prussia on diplomatic missions, and in 1870 reached St. Petersburg, where he died before transacting the official business which he had in hand.

BURLINGTON, a city of Iowa, located on the west bank of the Mississippi River, and on the main line of the Chicago, Burlington and Quincy railroad, and on six other railroads. The manufacturing and jobbing business is compactly gathered in the valley adjacent to the railroads and river, while for the most part the residences are spread over three hills that rise above the valley. The Mississippi is crossed here by a railroad bridge. There are 25 miles of street-railway operated by electricity. The mains of a steam-heating company, extending through the business portion, supply steam-heat abundantly. The city is well supplied with water from the river by the Holly system. Among the principal buildings are a government building costing $100,000, and an opera-house costing $90,000. There is also a charity hospital, a free circulating library of 10,000 volumes, and a business college. It is the seat of Burlington University. The advantages of river and railroad transportation have aided in building up an extensive manufacturing business. Population 1890, 22,528. See BURLINGTON, Vol. IV, p. 551.

BURLINGTON, a city of Kansas, county seat of Coffey County. It is situated on the Neosho River, about 60 miles S. of Topeka. The river furnishes an abundant water-power, and the city contains several mills and factories. Population 1890, 2,239.

BURLINGTON, a town of northern Kentucky, county seat of Boone County, situated 15 miles W.S.W. of Cincinnati, Ohio, and about seven miles W. from Erlanger station, on the Queen and Crescent railroad. It is the center of an agricultural district. Population 1890, 450.

BURLINGTON, a city and port of entry of Vermont. It is an extensive manufacturing town, and is the seat of the Vermont Episcopal Institute, the State Agricultural College, the University of Vermont and other institutions of learning. Its trade in lumber and in building stone and marble is very extensive. Population 1890, 14,590. See also BURLINGTON, Vol. IV, p. 551.

BURMAH. For general description and history prior to 1880, see BURMAH, Vol. IV, pp. 551, 561. The death of Mindoon Min in 1879 was followed by the accession of Thebaw, who commemorated his coronation by a series of barbarous massacres, chiefly of his own relatives. About 1885 the government at Mandalay infringed the terms of the existing treaty, and imposed a fine of $7,250,000 on a British company working in Upper Burmah. In October, a British ultimatum was sent to Mandalay and its terms refused, the refusal being shortly followed by a proclamation of war by Thebaw. A British force ascended the Irrawadi, the Burmese were defeated successively at Ava and Mandalay, and the war practically terminated with the capture of the king, who was carried a prisoner into India. In the spring of 1886, Upper Burmah was incorporated with the Queen's Indian possessions. The total area of the province (Upper and Lower Burmah) is 171,430 square miles. Population 1891, 7,605,560.

BUR-MARIGOLD, a name applied to the genus *Bidens*, of the family *Compositæ*, whose species are better known as "beggar-ticks." The pappus is developed as two or more downwardly barbed awns, by means of which the achene (containing the seed) is transported upon the coats of passing animals.

BURMEISTER, KARL HERMANN KONRAD, German naturalist; born in Stralsund, Prussia, Jan. 15, 1807. After preliminary studies in his native town he took a four years' course in medicine at the universities of Greifswald and Halle, graduating in 1829. The following year he published a *Manual of Natural History*, and was engaged to classify an extensive collection of insects at Hamburg. In 1842 he returned to the University of Halle to accept the chair of zoölogy. Six years later he resigned and spent two years in travel in Brazil, which resulted in the publication of his *Animals of Brasil* (2 vols., 1854). Returning, he resumed his chair at the University of Halle, but in 1861 again resigned and went to Buenos Ayres, in Argentine, where he became the founder and director of the Museum of Natural History, and in 1870 curator of the new University of Cordoba. Besides numerous textbooks and articles for scientific journals, he has written *L'Organisation des Trilobites* (1843); *Die Fossilen Pferde der Pampas-Formation* (1875); *Journey Through the La Plata States* (1881); a French work, in 10 volumes, entitled *Description Physique de la République Argentine;* and a *Manual of Entomology*, in 4 volumes, published in Berlin. He died in Buenos Ayres, May 1, 1891. See also ORNITHOLOGY, Vol. XVIII, pp. 26, 27.

BURNABY, FREDERICK GUSTAVUS, a daring traveler and dashing *sabreur;* born at Bedford, England, March 3, 1842. He was educated at Bedford, Harrow, and in Germany, and early became an accomplished linguist. He joined

the Royal Horse Guards in 1859, became captain in the regiment in 1866, lieutenant-colonel in 1880, and colonel in 1881. His travels in Central and South America, his experiences in the Carlist camp in 1874, and with Gordon in the Soudan in 1875, fitted him for his most notable exploit, the ride to Khiva, in the winter of 1875, across the steppes of Tartary. His *Ride to Khiva* (1876), written in a bright and pleasing style, made him famous; and indeed his fine physique, reckless courage, and outspoken frankness of manner admirably fitted him to be a hero of the English people. In 1876 he traveled in Asia Minor and Armenia, publishing on his return, *On Horseback Through Asia Minor*, which was no less popular than his first venture. He was attached to the intelligence department in Graham's expedition to Eastern Soudan, and was wounded at El Teb. In 1884 he joined Sir Herbert Stewart's column in the Nile expedition, and was killed by an Arab spear-thrust in the battle of Abu-Klea, Jan. 17, 1885. Burnaby was a daring aëronaut, and crossed the channel to Normandy in 1882 in the balloon *Eclipse*.

BURNAND, Francis Cowley, an English author and dramatist; born Nov. 29, 1836. He was educated at Eton and Trinity College, Cambridge (1854–58), and afterward went to Cuddesdon Theological College, with a view to becoming a clergyman of the Church of England. In December, 1858, he joined the Roman Catholic Church, and for four months continued his studies at the house of the Oblate Fathers at Bayswater. He was called to the bar in 1862, but the success of some early dramatic ventures altered his plans. He joined H. J. Byron in starting *Fun*, but left that paper for *Punch*, then edited by Mark Lemon. His first contribution to *Punch* was *Mokeanna*, a burlesque on sensational romance writing; soon after appeared *How, When and Where*, followed by the now well-known *Happy Thoughts*, which, in book-form, soon ran through over 16 editions. Later he continued the *Happy Thoughts* series, and wrote a series of burlesques of popular novelists—*Strapmore* in imitation of Ouida's *Strathmore*, being perhaps the happiest. Burnand has been editor of *Punch* since 1880.

BURNE-JONES, Sir Edward, English artist; born at Birmingham, England, of Welsh descent, Aug. 28, 1833. He was destined for the church, and educated at Exeter College, Oxford, but his love of art asserted itself, and he received from Rossetti encouragement and guidance in his attempts as a painter. From the first he was a fine colorist, and his earlier works attain in water-color greater brilliancy and purity of hue than is usual even in oil. It was not until 1870 that he began to be known as an oil-painter. Among his pictures are *The Days of Creation* and *The Mirror of Venus* (1877); *Le Chant d'Amour* (1878); *The Golden Stairs* (1880), *The Tree of Forgiveness* (1882); *King Cophetua* (1884); and *The Brazen Tower* (1888). In his later works his coloring tends to become less splendid, inclining to restrict itself to curiously varied tones of bluish purple and ruddy bronze. He has furnished many striking designs for stained glass.

BURNERS FOR LAMPS. Most of the recent forms of burners for oil-lamps are based on the Argand principle, having a central cylinder supplied with air both within and without. The Rochester makes use of a perforated tubular cap, fitted outside of the top of the air-tube, and the wick is adjustable by means of a holder and rod. In the sunlight burner a solid cylindrical wick is supplied with oil by three flat wicks, or sometimes by a series of separate round wicks, or sometimes the wicks themselves are set in a circle to form the burner.

Among gas-burners the Welsbach has created the greatest innovation within a few years. In this a perforated hood or mantle about two inches in length is hung over a pencil of flame. The mantle becomes white-hot, and diffuses double the light obtainable from the flame direct. These mantles are formed from the salts of some of the rare earths, as cerium, lanthanum, thorium, yttrium, zirconium, praseodymium, neodymium, and erbium. A cotton hood is first woven as a basis for the mantle, and this cotton is soaked in the salts by various patented processes. After drying, the cotton is burned out of the mantle, and it is ready for use.

E. Spiel of Berlin has recently invented a mineral-oil lamp for use with a Welsbach burner. The kerosene is vaporized and produces a flame strong in heat, but of little luminosity, that heats the mantle, the latter giving out an incandescent light said to be double that of an Argand burner consuming the same amount of oil.

Another late form of burner is the Schuelke, which receives the kerosene from an elevated reservoir, through a coil of brass tubing of small diameter, and vaporizes it. There are several burner-tubes, arranged in a circle, so as to form an Argand flame. C. H. Cochrane.

BURNET, a town of central Texas, county seat of Burnet County; situated on the Houston and Texas Central railroad, 45 miles N.W. of Austin. It is the center of a district the products of which are cotton, wool, live-stock and pecannuts. Population 1890, 1,454.

BURNET, the common name of species of *Poterium*, of the family *Rosaceæ*. Great burnet (*Poterium officinale*) is common in meadows in all parts of Europe, and is cultivated in Germany for fodder. The root-stalk is astringent, and was formerly used in medicine. Common burnet (*Poterium sanguisorba*) grows on chalky soils, and has also been cultivated as a fodder-plant. It grows wild in the United States.

BURNET, John, painter, engraver and author; born at Fisherrow, near Edinburgh, Scotland, in 1784; died at Stoke Newington, April 29, 1868. He first became known through his admirable engravings of Wilkie's works. Of his paintings the best known is the *Greenwich Pensioners* (1837). He was author of several books on art, the most important being a *Practical Treatise on Painting;* he was also

author of *Rembrandt and His Works* (1849), and, in conjunction with Cunningham, of *Life and Works of Turner* (1852).

BURNETT, FRANCES HODGSON, authoress; born in Manchester, England, Nov. 24, 1849. Her parents emigrated to America and settled in Knoxville, Tennessee. Two years afterward the daughter began to write short stories for magazines, and in 1872 a story from her pen was published in *Scribner's Magazine*. After her marriage to Dr. Luan M. Burnett of Knoxville, she visited Europe, and on her return took up residence in Washington, District of Columbia. Among her stories are *That Lass o' Lowrie's; Polly Pemberton; Haworth's Louisiana; A Fair Barbarian; Through One Administration; Little Lord Fauntleroy; Sara Crewe; Little St. Elizabeth;* and *A Lady of Quality*, the realism of which created some excitement.



FRANCES H. BURNETT.

BURNETT PRIZES, two prizes awarded every 40 years in Aberdeen, Scotland, for the best two essays on "the evidence that there is a Being all-powerful, wise and good, by whom everything exists." The prizes are adjudged by a committee consisting of three persons selected by the trustees of the fund, the principals and professors of Marischal and Kings colleges and the ministers of the Established Church of Aberdeen. Awards were made in 1815, 1855 and 1895. The fund for the Burnett Prizes was left by the will of Mr. Burnett of Dens, Aberdeenshire.

BURNETT'S LIQUID, a solution of zinc chlorid and iron, introduced by Sir William Burnett (1779–1861) for the purpose of disinfecting ships, hospitals, etc. It is used in the diluted form in the proportion of of a pint in five gallons of water. It is of service in preserving dead animal-tissues, as in the dissecting-room, and in jars containing anatomical specimens. When added to bilge or sewage water as a deodorizer, it mainly acts by decomposing the offensive sulphid of ammonium. Burnett's liquid has also been applied to the preservation of timber from the ravages of dry-rot, and the process of so treating wood is called *burnettizing*.

BURNEY, STANFORD GUTHRIE, an American Presbyterian minister; born in Tennessee, April 16, 1814; educated at Cumberland College, Kentucky; successively president of Union Female College, Oxford, Mississippi; professor of English literature and metaphysics in the University of Mississippi; of Biblical literature in Cumberland University; and professor of systematic theology in the same university. He published many theological works, among which are *Atonement and Law Reviewed; Soteriology; Studies in Psychology;* and *Studies in Theology*.

BURNHAM, DANIEL HUDSON, an American architect; born in Henderson, New York, Sept. 4, 1846; came to Chicago in 1855; studied architecture and began its practice in 1871, in connection with John W. Root (1850–91), under the firm name of Burnham and Root. This firm were the pioneers in the steel-frame system of construction of high buildings that has since been called the "Chicago system." Many of Chicago's principal buildings were erected from their plans. In October, 1890, Mr. Burnham was appointed chief of construction and supervising architect of the World's Columbian Exposition, and to him belonged much of the credit for the magnificence of the general plan, the beauty of the different exposition buildings and the rapidity with which they were erected.

BURNHAM, SHELBOURNE W., an American astronomer; born in 1840. He was for many years a shorthand reporter in Chicago, and devoted his leisure to astronomy, making a special study of double stars, and when the Lick Observatory in California was erected took charge of it. He became director of the Yerkes Observatory, Lake Geneva, Illinois, 1895.

BURNHAM INDUSTRIAL FARM, an American industrial institution, designed for the reclamation of wayward and unruly boys; situated near Canaan Four Corners, Columbia County, New York, on the banks of Lake Queechy. Frederic G. Burnham, the founder of this deserving institution, purchased 585 acres of an old Shaker settlement in 1887 and incorporated the farm. In 1889 the system of the Rauhe House in Germany and that of Mettray in France were put in force by the superintendent, Mr. W. M. F. Round. Brothers of the Order of St. Christopher, an order of young men organized by the superintendent, are in charge of the boys, who average three and a half years' training, although they are permitted to remain during minority. The teaching is essentially religious and Protestant in character. The farm is intended to accommodate about 1,200 boys. They may be sent from any part of the state, either by the parents on voluntary renunciation, by commitments from magistrate or by transfer from other institutions.

BURNOUF, EMILE LOUIS, a French writer and educator; born at Valognes, in La Manche, France, Aug. 25, 1821, a cousin of the Indologist, Eugene Burnouf. He was educated in France, and became professor of ancient literature at Nancy. He was successively director of the French School at Athens, and professor and dean of the faculty at Bordeaux. His contributions to art, history and literature have been numerous and valuable. Among his publications are *History of Greek Literature* (1869); *Japanese Mythology* (1875); *The Science of Religions* (1885); and *Life and The Actual Elements of Philosophy* (1886).

BURNS AND SCALDS are injuries to the body caused by excessive heat or by certain chemical agents. In minor degrees these accidents are very common; in their severer forms, far the most painful of injuries, and the most commonly fatal. In a severe burn or scald the pain is intense, and the shock and prostration extreme and often fatal. At this stage, opiates, warmth and stimulating remedies are neces-

sary. In two days or less, if the patient survives the shock of the injury, reaction sets in, and serious internal inflammations frequently occur.

For the local treatment of burns, the clothes must be removed with the greatest care, lest the cuticle be torn off with them. If the burn be of the first degree, and not extensive, cold applications are generally most useful and pleasant to the patient; lint or rags dipped in plain water. If the injured surface be extensive, cold applications are apt to increase the shock and the tendency to internal inflammations, and fine flour or baking-soda should be thickly dusted over the surface and covered with cotton wool. Carbolic lotion, carbolic oil, iodoform in powder or ointment, and many other antiseptics, are useful. When the clothes catch fire, the person should lie down on the floor, and roll herself, or be rolled, in the rug, table-cover, or anything sufficient to stifle the flames. See also SURGERY, Vol. XXII, p. 681.

BURNS, ANTHONY, a fugitive slave, the rendition of whom cost the state of Massachusetts much money, and did more to intensify the bitterness between the antislavery party and the South than any event before the war, other than John Brown's execution. Born in Virginia about 1830, Burns fled from slavery, to be arrested in Boston, May 25, 1854, under the provisions of the Fugitive Slave Law. Intense excitement was provoked; Theodore Parker, Wendell Phillips and a score of prominent citizens raised their voices against any recognition in free Boston of "the peculiar institution" of the South. A mob bent on rescue attacked the courthouse, and when Burns passed through the city under heavy guard to the revenue cutter ordered to take him back to Virginia, the tolling of church bells and exhibition of crape might have been for a national funeral. Burns afterward regained his liberty, studied at Oberlin University, and became a Baptist minister of a colored congregation at St. Catharines, Canada, where he died, July 27, 1862.

BURNS, FRANCIS, colored bishop of the Methodist Episcopal Church, was born of free colored parents in Albany, New York, Dec. 5, 1809. When 15 years old he was converted and studied for the ministry, showing such ability in his work among his own people that he was sent, in 1834, on the Liberian mission. Here he remained for ten years. In 1844 he visited the United States, and was ordained deacon in Brooklyn and elder in Mulberry Street Church, New York City; he returned to his work in Africa, where he was made presiding elder of Cape Palmas district, and opened an academy at Monrovia in 1851. He was made superintendent of missions, and on his second return to the United States, in 1858, was ordained missionary bishop. After nearly five years more in Africa, he returned to the United States on account of ill health. He died in Baltimore, Maryland, April 18, 1863.

BURNS, SIR GEORGE, an English ship-owner, famous as one of the founders of the "old reliable" Cunard line of transatlantic steamships; born Dec. 10, 1795; co-operated with Samuel Cunard and others in 1838 and founded the Cunard line for the conveyance of passengers, mail and merchandise between America and England. He was created a baronet in 1889, and died June 2, 1890.

BURNS, REV. JABEZ, an English Baptist minister and prolific religious writer; born at Oldham, near Manchester, England, Dec. 18, 1805; died in Paddington, Jan. 31, 1876. He was educated at Chester and Oldham, and at an early age became a preacher and prolific writer on religious subjects. He published 15 volumes of *Sermon Sketches*.

BURNS, JOHN, an English labor leader and socialist agitator. He was born in London, in 1858, in very humble circumstances. As apprentice to an engineer, he became an omnivorous student, and attained some notoriety by his socialistic views and speeches. He has twice been a member of the London county council, and at the Parliamentary election of July, 1892, was chosen to represent Battersea in the House of Commons. He was one of those who organized and won the great victory of the dock-laborers in 1889. Late in 1894 he visited the United States, addressing labor unions and socialists, and making himself unpopular by his criticisms of American ways and institutions.

BURNS, JOHN, born in Burlington, New Jersey, Sept. 5, 1793; died in Gettysburg, Pennsylvania, Feb. 7, 1872. He was one of the first volunteers of the War of 1812, and served at Plattsburg, Queenston and Lundy's Lane. He was a volunteer of the Mexican War, and, when he offered his services on the outbreak of the Civil War, he was not accepted, on account of his age, but was given the place of teamster, and whenever an engagement took place, he would borrow a gun so as to take part. He was finally discharged from the service on account of infirmities, but was chosen constable of Gettysburg. In June, 1863, when the Confederate scouts approached the town, he met them with a company of volunteers. June 26th, the Confederates held possession, and John Burns was locked up for exercising his authority in opposition to the Confederate officials. The Southern army went on toward York, and Burns, now being at liberty, began to arrest Confederate stragglers and scouts. On the 28th the Union army came to the assistance of the veteran, who, almost single-handed, had been contending against the army of northern Virginia. When the battle of Gettysburg was fought, Burns borrowed a gun from a wounded Union soldier, and went into the thickest of the engagement. He was wounded, and fell into the hands of the Confederates, to whom he told a plausible story, and then managed to be taken to his own house for medical treatment. He had a narrow escape from being shot for not wearing the army dress (Federal), but on the following day the Union army drove the opposing forces from the field, and John Burns was again in the hands of friends. The story of his patriotism was appreciated in the Northern states, and Bret Harte wrote a graphic poem about the incident. In his last years his mental faculties became clouded, and he frequently wandered from home. One cold night in December, 1871, he was found in a destitute condition, wandering about in New York City. His wants were supplied, and he was taken home, but died soon after, from pneumonia.

BURNS, Robert Ferrier, a Canadian Presbyterian minister; born in Paisley, Scotland, Dec. 23, 1826; educated at Glasgow and Edinburgh universities; emigrated to Canada in 1845 and finished his education at Knox College, Toronto; was successively pastor in Kingston, St. Catharines, Chicago (where he assisted Mr. Moody in evangelistic work), Montreal and Halifax. He was a delegate to Philadelphia and Belfast Pan-Presbyterian councils in 1880 and 1884, to the International Temperance Council (Philadelphia, 1876), to Raikes's Centennial of Sabbath Schools (London, 1880), and to the World's Convention of the Young Men's Christian Association (Berlin, 1884). Among his publications are *Life of Robert Burns* (his father); *Plea for Lord's Day* (1874); *Modern Babylon* (1876); and *Confession and Absolution* (1883).

BURNSIDE, Ambrose Everett, an American soldier; born in a log cabin at Liberty, Indiana, May 23, 1824; died in Bristol, Rhode Island, Sept. 3, 1881. He was first a tailor, but went to West Point, graduated in 1847, and served in Mexico. He invented a breech-loading rifle, and engaged in its manufacture at Bristol, Rhode Island, in 1853. He took a Rhode Island regiment to Washington in 1861, commanded a brigade at Bull Run, July 21, 1861, and later, General Hunter's division. August 6th, he was made brigadier-general of volunteers, organized a "coast division," and on Feb. 5, 1862, captured the Confederate garrison of 2,500 men on Roanoke Island. The surrender of Forts Macon and Beaufort followed. Burnside was then transferred to the army of the Potomac, with his old division reorganized as the Ninth Corps. He was twice offered the chief command and declined. In May, 1862, he was promoted major-general. He was sent with command of the First and Ninth Corps to meet General Lee at Sharpsburg, and encountered the Confederate force at South Mountain, Sept. 14, 1862. His force, the Ninth Corps, held, with great loss of life, the stone bridge at Antietam, Sept. 17, 1862, which was the important post of that battle. On Nov. 10th, Burnside reluctantly took the command relieving McClellan. He was defeated at Fredericksburg with a loss of 12, 653, superseded by Hooker, and transferred to the department of the Ohio, with headquarters in Cincinnati. Here forced to take measures against the Southern sympathizers, he issued the famous order defining treasonable offenses, and declaring that they would not be tolerated. Numerous arrests followed. In Aug. 1863, he crossed the Cumberland Mountains to Knoxville, where he lay fortified for a siege. Relieved from duty by the approach of General Sherman, he devoted himself to recruiting and reorganizing the Ninth Corps. He resumed command in April, 1864, at Annapolis, with nearly 20,000 men, and was again attached to the army of the Potomac, under General Grant. He led his force at the Wilderness, Cold Harbor, and Petersburg, and suffered severe defeats. General Meade brought charges of disobedience against General Burnside, and ordered a court-martial, which found him "answerable for the want of success." Burnside asserted that his plans of assault were always interfered with. He resigned from the army on April 15, 1865, and became at once identified with railroad construction and management. He was elected governor of Rhode Island in 1866, 1867 and 1868, but declined a re-election, and devoted himself to railroad interests. He went to Europe during the Franco-Prussian war, and was called upon to act as envoy between the two forces, endeavoring to negotiate peace. Returning to this country in 1875, he was elected to the United States Senate from Rhode Island, and was re-elected in 1880. In 1852 he married Mary Richmond, the daughter of Nathaniel Bishop of Providence, Rhode Island. See *Life and Public Services of Ambrose E. Burnside*, by Ben Perley Poore (Providence, 1882).



GENERAL BURNSIDE.

BURR, Aaron, born in Newark, New Jersey, Feb. 6, 1756; died on Staten Island, New York, Sept. 14, 1836. His father, Aaron, was a clergyman, and his grandfather was Jonathan Edwards. Left orphan at an early age, Aaron and his sister Sarah were brought up in the family of their uncle, the Rev. Timothy Edwards of Elizabethtown, New Jersey. In 1769 Burr entered Princeton, and was graduated in 1772. At the beginning of the Revolution he joined the patriot army near Boston, and enlisted as a private. He accompanied Benedict Arnold to Quebec, and returned with the rank of major and a brilliant reputation. Washington invited him to remain at his headquarters in New York, but Burr was dissatisfied and left him to become aid to General Putnam. This was the cause of a break in Washington's friendship; Burr affected to despise the military ability of the commander-in-chief, and Washington's impressions of Burr ripened into distrust. In July, 1777, Burr became lieutenant-colonel, with the command of his regiment, and joined the main army when it was about to go into winter quarters at Valley Forge. He distinguished himself at the head of a brigade in the battle of Monmouth, June 28, 1778. For a short time he commanded at West Point, but in March, 1779, resigned on account of impaired health. He then studied law with Judge Patterson of New Jersey, and afterward with Thomas Smith of Haverstraw, New York, and was admitted to the bar in Albany in 1782. In July of that year he married Theodosia, widow of Augustine Prevost, a British officer, and when the Americans regained possession of New York City, settled at Richmond Hill. In 1784 he was a member of the state assembly, and in 1789 was appointed



AARON BURR.

attorney-general of New York, which office he held two years. After the adoption of the constitution in 1788, he was a candidate of the Anti-Federal party. He gathered many ambitious young men around him as satellites, and they were known as "Burr's Little Band." In 1791 he was elected to the United States Senate over General Philip Schuyler, and served for six years, acting with the Republican party, as the Anti-Federalists were called. In 1797 the Federal party gained control again, and Burr was made a member of the New York assembly. He threw himself with great zeal into the Presidential contest of 1800, and his talent for political manipulation came into full play. The Republicans were victorious, but there was a tie between the highest candidates, and Burr, who had been supported for the Vice-Presidency, began intriguing to supplant Jefferson for the higher office, but was defeated in the House of Representatives, and loudly condemned for his cool and daring plot. Toward the close of his service as Vice-President he endeavored to recover popularity, and forced himself as a candidate for governor of New York, but was defeated through the influence of Alexander Hamilton. They had long been rivals, and Hamilton's opinions regarding Burr having appeared anonymously in the newspapers, the latter seized upon this for a challenge. His opponent endeavored to avoid extremities, but finally accepted, and they met on the bank of the Hudson at Weehawken, New Jersey, on July 7, 1804. Hamilton fell at the first fire. The tragedy caused great excitement, and Burr fled to South Carolina and took refuge with his daughter, Theodosia, who had married Joseph Alston, afterward governor of that state. Later he returned to Washington and completed his service as Vice-President. His political prospects now destroyed and his fortune dissipated, in 1805 he turned his attention to the great West, and on his way down the Ohio fell in with Harman Blennerhassett, who was moved by Burr's talk of empire, and readily entered into his schemes. His scheme of "filibusterism" was to form a body of men and conquer Texas, and perhaps Mexico, and to establish a republic, of which he was to be the head. His adherents were adventurous young men of the East and hardy Western pioneers. Blennerhassett's island was made their rendezvous, while Burr traveled through Kentucky and Tennessee. He bought a vast tract of land on the Washita river, for which $40,000 was paid. General James Wilkinson, a veteran of the Revolution, then stationed at New Orleans as a senior officer, who had carried on a cipher correspondence with Burr regarding his enterprise, informed the President of Burr's purposes. President Jefferson then issued a proclamation, Oct. 27, 1806, warning the people to withdraw from the project. On Jan. 14, 1807, Burr was arrested in the Mississippi territory, escaped, was rearrested in Alabama, and taken to Richmond, where he was imprisoned. His trial, beginning May 22, 1807, lasted for six months. At length he was acquitted, and afterward went to Baltimore. He sailed for England under an assumed name, and there made efforts to procure the aid of European governments to establish his empire in Mexico. Expelled from England, he went to Sweden, thence to Germany and Paris. In the latter city he was kept under government surveillance and refused permission to return to the United States. At last he secured a passport and sailed from Amsterdam, but his ship was captured by a British frigate and carried to Yarmouth. He finally escaped from London, where he had lived in poverty for five months, and arrived penniless in Boston, in May, 1812, under the name of Arnot. He settled in New York and practiced law with brightening fortune, but in 1813 he met with a great affliction. His daughter, Theodosia, one of the most accomplished of American women, was lost at sea while traveling from Charleston to New York to visit her father. At the age of 78 Burr married Mme. Jumel, the widow of a French merchant. They were finally separated, though not divorced.

BURR, Enoch Fitch, an American mathematical and religious writer; born in Green's Farms, Fairfield County, Connecticut, Oct. 21, 1818; was graduated at Yale in 1839, and afterward studied theology and science at New Haven. His first pastoral charge was in Lyme, Connecticut. In 1868 he was appointed lecturer on the evidences of religion, at Amherst College. His works include *A Treatise on the Application of the Calculus to the Theory of Neptune* (1848); *The Doctrine of Evolution* (1873); *Universal Beliefs* (1887); and many others.

BURR, George Lincoln, an American educator; born at Oramel, New York, Jan. 30, 1857; educated at Cortland Academy, Cornell, Leipsic and Zurich universities, the Sorbonne and L'Ecole des Chartes, Paris; in 1878 he was appointed librarian of the White Library, Cornell, and later professor of ancient and modern history at Cornell. His books include *The Literature of Witchcraft* (1890); *The Fate of Dietrich Flade* (1891); *Charlemagne;* and numerous magzine articles and reviews.

BURR, Theodosia, only daughter of Aaron Burr and his wife, Theodosia (Prevost); born in New York City in 1783; lost at sea, in January, 1813. She was a brilliant and highly accomplished woman, for her father superintended her education, carefully developing her mental and physical qualities and training her to independence of thought and self-reliance. She married Joseph Alston (1801), afterward governor of South Carolina. She and her father were extremely attached to each other, and her faith in him remained unshaken through all the misfortunes which he brought upon himself. Burr's scheme to become emperor of Mexico was known by herself and husband, and it was even planned that her only child, a son, would be heir apparent to the throne. On her father's trial for treason at Richmond, she appeared in court, and her beauty and graces were not without effect, both on jury and spectators, in securing a favorable verdict and modifying popular indignation. She wrote eloquent letters to Mrs. Madison, Secretary Gallatin and former friends of her father, while he was in exile, and thus made it possible for him to return to the United States. The death of her only child was a terrible blow, and made her ill with a fever; but learning that her father had arrived in America, she left Charleston on the pilot-boat *Patriot*, and started for New York.

A storm off Cape Hatteras probably capsized the boat, for it was never heard of again.

BURR, WILLIAM HUBERT, an American civil engineer; born in Connecticut, July 14, 1851; educated at Rensselaer Polytechnic Institute at Troy, New York, where he was subsequently professor of rational and technical mechanics until 1884, when he became identified with two engineering and contracting firms. In 1893 he was called to the chair of civil engineering in Columbia College, New York. He has written several standard professional works, among them *Stresses in Bridge and Roof Trusses; The Theory of the Masonry Arch; The Elasticity and Resistance of the Materials of Engineering.*

BURRA-BURRA, the name of a famous copper-mine in South Australia, 101 miles N.E. of Adelaide, discovered in 1844. See SOUTH AUSTRALIA, Vol. XXII, p. 284.

BURRARD INLET, a narrow inlet in the southwest corner of British Columbia, a little north of the mouth of the Fraser River. It is nine miles in length, and with Esquimalt forms one of the finest harbors on the Strait of Georgia, being easy of access for the largest ships. It has become of much more importance since the opening of the Canadian Pacific railway, whose terminus is at Vancouver, on the north shore of this inlet.

BUR-REED, the popular name of species of *Sparganium*, of the family *Typhaceæ*, closely allied to *Typha*, the cattail-flag, and of similar habitat and distribution. So called from its reed-like leaves and bur-like heads of fruit. See Vol. XX, p. 319.

BURRIANA, a town of Spain, 34 miles N. of Valencia, on the Mediterranean. It is an important shipping-point for fruit and wines. Population 1890, 10,058.

BURRITT, ELIHU, an American linguist and reformer, prominent as an advocate of the principles of the Peace Society, and widely known as the "Learned Blacksmith"; born in New Britain, Connecticut, Dec. 8, 1810; died there, March 6, 1879. His father was a shoemaker, and the boy learned the trade of a blacksmith, which he pursued in his native place and in Worcester, Massachusetts, to which town he removed. All his leisure was devoted to study, especially of mathematics and languages. In the latter he achieved a very wide range, but is even better known to the world as an earnest advocate of peace than as a scholar. At Worcester he edited the *Christian Citizen*, advocating the peaceful settlement of international questions, and the doctrine of "universal brotherhood," and he traveled much in Europe and America, lecturing and working in other ways for the extension of his views on peace, temperance, self-culture and the emancipation of the slaves. In 1865 he was appointed United States consul at Birmingham, England. Among his published works were *Sparks from the Anvil; Olive Leaves; Handbook of the Nations; A Walk from John O' Groat's to Land's End; The Mission of Great Suffering; Walks in the Black Country; Ten-Minute Talks;* and *Chips from Many Blocks.*

BURR OAK OR BUR OAK. See OAK, Vol. XVII, p. 693.

BURROUGHS, JOHN, an American essayist; born in Roxbury, New York, April 3, 1837. He was a farmer's son; received an academic education; became a New York journalist; was a treasury clerk in Washington, District of Columbia, from 1864 to 1873, and afterward examiner of national banks. In 1874 he settled on a farm near Esopus, New York, and has devoted his time to fruit-culture and literature. A close observer and enthusiastic lover of nature, his published essays make delightful reading.



JOHN BURROUGHS.

Among them are *Wake Robin; Winter Sunshine; Birds and Poets; Locusts and Wild Honey; Pepacton; Fresh Fields;* and *Signs and Seasons.*

BURROWING OWL (*Speotyto cunicularia*), a small bird of the owl-family, peculiar to America, where it is found on the pampas of South America, and plains of western United States. It usually dwells in prairie-dog burrows, but is able to dig its own burrow. It is diurnal in its habits, and feeds largely on insects.

BURROWS, JULIUS C., born in Erie County, Pennsylvania, Jan. 9, 1837; served in the Union army (1862–64), and after the war became prosecuting attorney at Kalamazoo County, Michigan. In 1875–76 he served in Congress as a Republican, and again from 1879 to 1881. He represented the fourth Michigan district from 1884 until his election to the United States Senate in 1895.

BURRSTONES. See BUHRSTONE, in these Supplements.

BURSARY, in the universities and colleges of Scotland the annual proceeds of a sum permanently invested for the maintenance of a student. Elsewhere the term is applied to the treasury of a college or monastery. See BELGIUM, Vol. III, p. 520.

BURSCHENSCHAFT, the name of a famous association of German students, at one time prominent in the politics of the fatherland. It was founded at Jena in 1813, and composed of students who had fought in the great war of liberation. The *Burschenschaft* aimed to cherish the higher ideals of patriotism, and especially of German national unity. In the time of reactionary policy, the club was suspected of revolutionary tendencies, and in 1819 was suppressed by the government. Many such organizations now exist.

BURTON, SIR FREDERICK WILLIAM, water-color painter; born in County Clare, Ireland, in 1816, and educated at Dublin. In 1856 he became a member of the Society of Painters in Water-Colors, and in 1874 director of the National Gallery. In 1884 he was knighted.

BURTON, JOHN HILL, a Scotch historian; born at Aberdeen, Scotland, Aug. 22, 1809; died Aug. 10, 1881. He graduated at Marischal College, Aberdeen; was articled to a lawyer, and came to the Edinburgh bar, but subsequently devoted himself chiefly to study and letters. He was appointed secretary to the prison board of Scotland, and became

one of the prison commissioners. He held the old office of historiographer royal for Scotland. Among his works may be mentioned *Life of Hume* (1846); *Political and Social Economy* (1849); *History of Scotland from the Revolution to the Extinction of the Last Jacobite Insurrection* (1853); *The History of Scotland from Agricola's Invasion to the Revolution of 1688* (1867–70); *The Book-Hunter* (1862); *The Cairngorm Mountains* (1864).

BURTON, SIR RICHARD FRANCIS, one of the most daring Englishmen and successful of modern travelers; born in 1821 at Barham House, Hertfordshire, England; died at Trieste, Austria, Oct. 20, 1890. He was educated in France and England, and in 1842 he entered the Indian service, and served in Sindh under Sir Charles Napier. In 1851 he published his first important work, on *Sindh*. Burton acquired a very familiar acquaintance with Hindustani and Persian, and learned to speak Arabic like a native.



RICHARD F. BURTON.

He explored Arabia in the disguise of an Afghan pilgrim. His *Personal Narrative of a Pilgrimage to El Medinah and Mecca* (1855; new ed., 1879–80) records one of the most daring feats on record.

His next journey was into the country of the Somalis to Harar, in Eastern Africa. He was chief of staff to General Beatson in the Crimea. In 1856 he set out in company with Speke on the journey which led to the discovery and exploration of the great lake of Tanganyika, and afterward traveled in North America.

In 1861 Burton married, and was appointed consul at Fernando Po; and while holding this appointment he visited the Cameroon Mountains, and went on a mission to the king of Dahomey. He was subsequently consul at Santos, in Brazil, and at Damascus; and in 1872 he succeeded Charles Lever in the post of British consul at Trieste. He received the gold medal of both the English and French geographical societies, and was knighted in 1886. He was master of 35 languages and dialects. Among Burton's many works are *First Footsteps in East Africa* (1856); *The Lake Regions of Central Africa* (1860); *Wanderings in West Africa* (1863); *The Nile Basin* (1869); and his *magnum opus*, the literal translation, in 15 volumes, of the *Thousand and One Nights*.

His wife, ISABEL BURTON, was the companion of his wanderings after 1861, and has written a narrative of travel, *Inner Life of Syria, Palestine, etc.* (1875); and *Arabia, Egypt, India* (1879). Her husband's last work, a translation of *The Scented Garden*—the labor of 15 years—she destroyed, probably at the instance of her cousin, Cardinal Vaughan, although she is said to have been offered $30,000 for the MS. Its treatment of a certain passion being at variance with modern morality, she believed the publication would cast reproach upon the translator. She received much censure and some praise for her act. Lady Burton died March 23, 1896.

BURTON, WILLIAM EVANS, English playwright and comedian; born in London, Sept. 24, 1804; died in New York, Feb. 10, 1860. He came to the United States in 1834, and spent four years in Philadelphia. Subsequently he appeared in New York in James W. Wallack's theater, playing, for the benefit of Samuel Woodworth, author of *The Old Oaken Bucket*.

Burton opened a theater of his own in New York in 1848. His most brilliant hits were in the characters of Sir Toby Belch, Micawber, Sam Weller, Captain Cuttle, Bottom, Mr. Toodles, Jeremiah Clip, Touchstone and Falstaff.

He edited *The Literary Souvenir;* established *The Gentleman's Magazine*; and published a *Cyclopedia of Wit and Humor*.

BURYING-BEETLE (*Necrophorus*), the common name of insects of the family *Silphidæ*, which have a peculiar habit of burying small dead vertebrate animals in which they have deposited their eggs. They are often called sextons, or grave-diggers. See COLEOPTERA, Vol. VI, p. 130.

BUSACO, a hamlet in Beira, Portugal, 17 miles N.E. of Coimbra. Here, on a ridge (1,826 feet high) on the north side of the river Mondego, Wellington, with 40,000 British and Portuguese troops, repulsed the attack of Masséna with 65,000 French, Sept. 27, 1810. The loss of the French was about 4,500; of the allies, 1,300.

BUSBY, a military head-dress worn by hussars and horse-artillerymen in the European armies. It consists of a fur hat, with a short bag hanging down from the top on its right side, of the same color as the facings of the regiment, and an upright plume in front. The origin of the name is obscure, but seems to be Hungarian, and it is said that the bag is a relic of a Hungarian head-dress, from which a long padded bag hung down over the right shoulder to ward off sword-cuts.

BUSCH, JULIUS HERMANN MORITZ, a German journalist and man of letters, Under-Secretary of State at Berlin; born in Dresden, Feb. 13, 1821. His literary works consist of numerous translations into his own language of the writings of popular American and English authors, of entertaining accounts of his own extensive travels, and of political essays on his own and other countries. During the Franco-Prussian war he was in close relationship with Bismarck; and his diary, kept during the campaign, has been translated into English, French, Dutch, Swedish and Russian.

BUSENTO, the ancient Busentinus, a river of the province of Salerno, Italy, emptying into the Gulf of Busento, and having at its mouth the city of Policastro. Its course was diverted in order to bury Alaric the First, king of the Visigoths. See ALARIC, Vol. I, p. 443.

BUSH-ANTELOPE, also called BOSCHBOK and BUSH-GOAT, names common to a number of species of the genus *Tragelaphus*, natives chiefly of the southern and western parts of Africa. See BOSCHBOK, in these Supplements.

BUSHEL, a dry measure containing eight gallons,

or four pecks. In Great Britain the Winchester bushel (so called because the ancient standard bushel measure was preserved in the town hall of Winchester) was the standard measure from Anglo-Saxon times until the imperial bushel was legally established in 1826; its capacity was 2,150.42 cubic inches. The capacity of the imperial bushel is 2,218.192 cubic inches, and contains 80 pounds avoirdupois of distilled water at the temperature of 62° F., with the barometer at 30 inches. Measures of capacity in the United States are founded on the Winchester bushel. Various weights of different commodities have been made bushels by law, and vary considerably in different states.

BUSHNELL, a city of McDonough County, in the western part of Illinois, about 50 miles W. of Peoria. It is finely situated in a healthful prairie region, and on the lines of the Chicago, Burlington and Quincy and Toledo, Peoria and Western railroads. It contains a normal college and various manufactories, and in the vicinity are found excellent coal and timber. Population 1890, 2,314.

BUSHNELL, DAVID, an American inventor; born at Saybrook, Connecticut, in 1742; died in Warrenton, Georgia, in 1824. He was a graduate of Yale in 1775. His mind was of an inventive turn, and during his college course he was at work constructing a torpedo for the destruction of ships. He built the *American Truth*, an iron-plate diving-boat to carry one man, who should guide himself to the enemy's vessel and thereto fasten the Bushnell torpedo, which was regulated by clockwork to explode at a given time. In 1777 he successfully tested his invention, and with it blew up a British schooner in New York harbor. The following year he sent a fleet of barrels down the Delaware to destroy the British ships. The scheme was not entirely successful, but the next day they exploded and blew up one boat. *The Battle of the Kegs*, a humorous poem by Francis Hopkinson, describes the incident. Mr. Bushnell invented several destructive machines, not all of which were successful. He served during the war of the Revolution, and was made captain of the corps of sappers and miners.

BUSH-RANGERS, in Australia, originally runaway convicts, who had taken to the "bush" and become robbers. In the early years of the century they established a reign of terror in what was then the sparsely settled Van Diemen's Land. In 1815 martial law was proclaimed in the district by the lieutenant-governor, and under Governor Arthur (1824–36) stern measures were taken to repress crime. In 1830 a severe bush-ranging act was passed in New South Wales, where, at one time, a band of 50 desperadoes in the Bathurst district fought regular engagements with the settlers and police, and only surrendered to a detachment of soldiers brought from Sydney. Subsequent outbreaks occurred at intervals, but after a more or less brief and desperate course, they were brought to justice. In later years bush-ranging was facilitated by the colonial land laws, which permitted "free selection before survey," thus allowing people to settle in isolated spots outside the scope of police supervision. The extension of the police system and the extinction of the "Kelly gang" has rendered bush-ranging a matter of past history.

BUSH-SHRIKE, the name of a South American passerine bird, of the ant-thrush family (*Formicariidæ*). It haunts thick trees, bushes and underwood, where it seeks for insects, larvæ, young birds and eggs.

BUSINESS COLLEGES, educational institutions in which young persons of both sexes are given practical and theoretrical training for commercial employment. Stimulated by the demand for stenographers and typewriters, the business colleges of the United States have increased in a few years from a score of scattered schools of little standing and less utility to over 250 excellent institutions, affording, with their 1,600 instructors, the most practical instruction to nearly 100,000 students. In addition to courses in stenography, typewriting, telegraphy and other special subjects, the business colleges, the course of instruction varying from four months to two years, afford to young people a practical insight into the workings of great commercial institutions, and in so doing render them more fit to take subordinate positions therein. Employment bureaus run in connection with business colleges are often of material value in obtaining positions for industrious and intelligent graduates.

BUSSEY, BENJAMIN, an American patriot and philanthropist of Revolutionary days; born in Canton, Massachusetts, March 1, 1757; served in the Revolutionary army and was present at Burgoyne's surrender at Saratoga. He was by trade a silversmith, located at Dedham, in Massachusetts, and in later life was one of Boston's leading merchants. He died in Roxbury, Massachusetts, Jan. 13, 1842, bequeathing by his will $350,000 to the trustees of Harvard University, $175,000 of which was to be used in the foundation of the present Bussey School of Agriculture, and the balance applied for the sustenance of the law and divinity schools.

BUSSEY, CYRUS, born in Hubbard, Trumbull County, Ohio, Oct. 5, 1833, and entered the mercantile business. He was elected to the state legislature as a Democrat in 1858, and was a delegate to the convention that nominated Stephen A. Douglas for the Presidency. During the war he served in the Union army. He was made brigadier-general in 1864 for "special gallantry," restored discipline at Fort Smith, where he was given command, and in 1865 was brevetted major-general. He has been in business in St. Louis and New Orleans since the war, and in 1881 removed to New York. He was for six years president of the New Orleans Chamber of Commerce, and was chairman of the committee from that body which secured from Congress the appropriation for Captain Eads's jetties at the Mississippi River's mouth.

BUST, the sculptural representation, in the round, of the head and shoulders of a person. For the application of the term to coins or bas-reliefs, see NUMISMATICS, Vol. XVII, p. 630.

BUSSU-PALM (*Manicaria saccifera*), a palm growing in the tidal swamps of the Amazon. The stem is only from 10 to 20 feet high, but the immense undivided coarsely serrate leaves are often 30

feet in length by four or five in width. These are used by the Indians for thatch. The spathes, taken off entire, are used as bags, or, when cut longitudinally and prepared, answer the purpose of coarse, strong cloth.

BUSTAMENTE, ANASTASIO, a Mexican physician, soldier and statesman; born at Jiquilpan, in the province of Michoacan, July 27, 1780; died at San Miguel de Allende, Feb. 6, 1853. He was physician in the family of Don Felix Maria Calleja, military governor at San Luis Potosi. Presented by his employer with a commission in the San Luis militia, he rose through the successive military grades to the position of general of division, the highest rank in the Mexican army, and became military governor of the interior provinces. In 1829 he headed the revolution, and the following year became vice-president of the republic, exercising the supreme executive power. This position he held until the revolution of 1832 obliged him to resign, and the following year he was banished from Mexico. On the death of Santa Anna he was recalled and elected president of the republic, his term extending from 1837 to 1841. In 1846 he was appointed president of the congress, the last important office held by him.

BUSTEED, RICHARD, born in Cavan, Ireland, Feb. 16, 1822. He emigrated with his father to Canada, whence he came to New York City, and was a licensed local Methodist preacher. Admitted to the bar in 1846, he made a reputation in extradition cases, and for three years was corporate counsel for New York City. He was a Democrat and a supporter of Douglas, and after the outbreak of the Civil War he strongly supported the Union cause. He was made brigadier-general of volunteers, and was assigned to service at Washington and New York. He commanded a brigade at Yorktown, in Virginia, but resigned on account of the jealousy of his enemies in the Democratic party. In 1864 he was appointed by the President as United States district judge of Alabama, and while occupying this position rendered the decision that the test-oath prescribed by the United States was unnecessary, and unconstitutional as applied to lawyers practicing before the United States courts. This opinion was afterward confirmed by the supreme court. Busteed resigned his office in 1874, and returned to his law practice in New York City.

BUTCHER-BIRD. See SHRIKE, Vol. XXI, pp. 845, 846.

BUTCHER'S BROOM (*Ruscus*), a genus of evergreen, usually dioecious, shrubs of the asparagus group of *Liliaceæ*. *Ruscus aculeatus* is the common butcher's broom, so called because used by butchers to sweep their blocks. It grows more commonly and luxuriantly in the south of Europe. The fruit is a red, one-seeded, sweetish berry. It grows well under trees or shrubs, and can often be advantageously introduced for ornamental purposes.

BUTEA, a genus of plants belonging to the family *Leguminosæ*. They are largely tropical, the larger and more striking members of the genus, (*B. frondosa* and *B. superba*) being natives of India. The large flowers are borne in racemes upon a pedicel of exceptional length. They are commonly of bright scarlet hues, and are used in India in the manufacture of a dye. Gum kino is obtained from the sap of *B. frondosa*, the dhak tree. See also KINO, Vol. XIV, p. 91.

BUTLER, BENJAMIN FRANKLIN, an American lawyer, statesman and soldier; born in Deerfield, New Hampshire, Nov. 5, 1818; graduated at Waterville University, Maine, in 1838; admitted to the bar in 1840. He was a Democrat, and was elected to the Massachusetts legislature in 1853 and to the state senate in 1859. He practiced law in Lowell, Massachusetts, and became prominent in his profession. Previous to the Civil War he was twice a candidate for the governorship of Massachusetts. He was a delegate to the national democratic convention held in Charleston, South Carolina, in 1860, and took part in the proceedings of the adjourned convention held in Baltimore until there was a second secession of the Southerners on account of the admission of the Douglas delegates to the vacant seats, when he retired. At the beginning of the Civil War he was appointed brigadier-general of the state militia, and on April 17th marched to Annapolis, Maryland, with the Eighth Massachusetts regiment, to command the district of Annapolis, including Baltimore, which city he entered on May 13, 1861, at the head of 900 men, and occupied without opposition. On May 16, 1861, he was appointed major-general of volunteers, and given command of the department of eastern Virginia, with headquarters at Fortress Monroe. While he was here some runaway slaves took refuge in his lines, and he refused to deliver them to their masters, saying that they were contraband of war. This was the origin of the term *contraband*, as applied to negroes.



BENJ. F. BUTLER.

General Butler captured Fort Clark and Fort Hatteras in August, 1861. In March, 1862, he led an expedition to the Gulf of Mexico. After Farragut's capture of New Orleans, Butler commanded there from May to December, and administered affairs with great vigor. He preserved order and public health, and armed the free colored men. Resentment was caused by his hanging William Mumford for hauling down the United States flag from the mint, and by the issue of "Order No. 28," his famous "woman order." Jefferson Davis, in December, 1862, issued a proclamation declaring him to be an outlaw. While in New Orleans he seized $800,000, which had been deposited in the office of the Dutch consul, claiming that it was intended to buy arms for the Confederates with this money, but the government ordered him to return it. On Dec. 16, 1862, he was recalled, and in 1863 was placed in command of Virginia and North Carolina, his troops being afterward known as the army of the James. He formed a plan to capture Richmond by opera-

tions from the south side of the James, intending to co-operate with the army of the Potomac from the north, but he was checked by General Beauregard, and many of his troops were transferred to the army of the Potomac. In October, 1864, he was in New York suppressing the anti-draft riots, and afterward was sent to Fort Fisher, North Carolina. He was removed from command by General Grant, and returned to Massachusetts. In 1866 he was elected to Congress as a Republican, and served until 1879, with the exception of the year 1875–76. He took an active interest in the reconstruction of the Southern states, and also in the impeachment of President Johnson. He was the unsuccessful Republican nominee for governor of Massachusetts in 1871, and in 1878 and 1879 was again defeated for the same office on the ticket of the Greenback party and of an Independent Democratic wing. In 1882 he was elected by the Democrats, but was defeated in 1883. In 1884 he ran as the Greenback-Labor candidate for President. He died Jan. 11, 1893.

BUTLER, BENJAMIN FRANKLIN, born at Kinderhook Landing, New York, Dec. 17, 1795; died in Paris, France, Nov. 8, 1858. He studied law with Martin Van Buren, in Hudson, New York, and became his partner. In 1821 he was chosen district attorney of Albany County. He was one of three commissioners appointed by the legislature to revise the New York statutes, and in 1828 was elected to the legislature to assist in the deliberations on the work of this committee. He was appointed Attorney-General by President Jackson.

BUTLER, CLEMENT MOORE, clergyman and author; born in Troy, New York, Oct. 16, 1810; died in Philadelphia, March 5, 1890. He was graduated at Washington (now Trinity) College, Hartford, Connecticut, in 1883, and three years later at the General Theological Seminary, New York City. He was pastor successively of churches in New York City, Palmyra, New York, Georgetown, District of Columbia, Boston and Washington, serving also as chaplain of the United States Senate from 1849 to 1853. From 1861 to 1864 he was in Rome, Italy, as rector of Grace Church, and chaplain to the United States minister there. Returning to the United States in 1864, he became professor of ecclesiastical history in the divinity school of the Protestent Episcopal Church in Philadelphia, where he remained for twenty years, until obliged by failing health to resign. Among the numerous books of which he is the author are *The Book of Common Prayer Interpreted by Its History; Old Truths and New Errors; Ritualism of Law; Manual of Ecclesiastical History from the First to the Nineteenth Century; History of the Reformation in Sweden;* and many sermons, including the funeral sermons of John C. Calhoun and Henry Clay, which were printed by order of the Senate.

BUTLER, ELIZABETH SOUTHERDEN (THOMPSON), a noted English artist; born at Lausanne, in Switzerland, in 1844, and in 1877 married Major-General William Francis Butler (q.v., in these Supplements). She was brought into prominence by her painting, *The Roll Call*, which was exhibited at the Royal Academy in 1873, and which was purchased by Queen Victoria. Her works are mostly military subjects, and include *Missing; The Remnants of an Army; The Charge of the Scots Greys at Waterloo; The Defence of Rorke's Drift; Floreat Etona! an Incident at Laing's Neck; The Twenty-eighth Regiment at Quatre Bras; The Camel Corps;* and others.

BUTLER, FANNY KEMBLE. See KEMBLE, in these Supplements.

BUTLER, JOHN, born in Connecticut; died in Niagara, in 1794. He espoused the British cause at the commencement of the Revolution, and, placed in command of a force of Indians and Tories, took part in the Niagara and Montreal campaigns, and was present at the battle of Oriskany, the Wyoming massacre, and the raids on the Schoharie and Mohawk settlements. He was guilty of great barbarities, but some of the worst deeds attributed to him were due to his son Walter. Colonel John Butler was rewarded by the British government for his military services by being made Indian agent, with a salary of $3,500 a year, and the gift of 5,000 acres of land in Canada.

BUTLER, PIERCE MASON, an American soldier, born in Edgefield district, South Carolina, April 11, 1798; killed in the battle of Churubusco, Mexico, Aug. 20, 1847. He received a military education, and after four years' service in the army, he resigned and went to Columbia, South Carolina, where he was president of a bank. In 1836 he went as lieutenant-colonel of a regiment to suppress an outbreak of the Seminole Indians; in 1838 he was elected governor of South Carolina, and at the expiration of his term was appointed Indian agent. In 1846 he resigned this office to enter the Mexican War. He served with great bravery as colonel of the "Palmetto Regiment" and won distinction at Cerro Gordo. In the battle of Churubusco he led his men after being wounded, but was again shot, and this time instantly killed.

BUTLER, WILLIAM, an Irish-American Methodist Episcopal missionary; born in Dublin, Ireland, Jan. 31, 1818; educated at Manchester; entered the Wesleyan ministry; in 1869 became secretary of the American and Foreign Christian Union; was the founder of Methodist missions in India and Mexico. He was the author of the Methodist Episcopal part of the *Cyclopædia of Missions.* His other works include *From Boston to Bareilly* (1885) and *Mexico in Transition* (1892).

BUTLER, WILLIAM ALLEN, an American author and lawyer; born in Albany, New York, Feb. 20, 1825; graduated from New York University, traveled in Europe, practiced law in New York City, and published books, magazine articles and fanciful poems. Among his writings are *Out-of-the-Way Places in Europe; The Colonel's Club; The Cities of Art and the Early Artists; Barnum's Parnassus; Nothing to Wear* (a satirical poem); *Two Millions; General Average; The Bible by Itself; Martin Van Buren, Lawyer and Client; Mrs. Limber's Raffle;* and *Domesticus.*

BUTLER, SIR WILLIAM FRANCIS, MAJOR-GENERAL, an English soldier, born in County Tipperary, Ireland, in 1838. He was educated at Dublin,

and, joining the army, served on the Red River expedition; was sent on a special mission to the Saskatchewan (1870–71); served on the Ashanti expedition (1873), as staff officer in Natal (1879), and took a prominent part under Lord Wolseley in the Soudan campaign (1884–85). He has published *The Great Lone Land* (1872); *Wild North Land* (1873); *Akimfoo* (1875); *Far Out* (1880). In 1877 he married Miss Elizabeth Southerden Thompson, a well-known painter of battle scenes.

BUTLER, WILLIAM ORLANDO, an American patriot; born in Jessamine County, Kentucky, in 1791; died in Carrollton, Kentucky, Aug. 6, 1880. He was a graduate of Transylvania University, studied law, but on the outbreak of the War of 1812 went into military service. He was at Fort Wayne, the two battles (Jan. 18 and 22, 1813) on Raisin River, and at the second was wounded and captured, escaping to his native state only after great hardships. He left the army in 1817, and resumed his law practice. He served in the Mexican War, and was wounded at Monterey. In 1848 he succeeded General Scott as chief commander, and held the place till the war closed. He was unsuccessful candidate for the Vice-Presidency in 1848, when Cass was at the head of the ticket.

BUTLER, a town of western central Georgia, situated on the Central Railroad of Georgia, 80 miles S. of Atlanta; is in an agricultural district, and ships cotton and fruit. Population 1890, 712.

BUTLER, a prosperous town of western Missouri, county seat of Bates County. It is pleasantly situated in a fertile prairie, about 73 miles S. of Kansas City, and on the line of the Missouri Pacific railroad. It is an important shipping-point for coal, which is extensively mined in the vicinity. It contains, also, manufactories of wool, and is the seat of an academy. Population 1890, 2,812.

BUTLER, a town of western Pennsylvania, county seat of Butler County, situated on the Conequenessing Creek, about 26 miles N. of Pittsburg, and on three lines of railroad. It contains extensive glass manufactories, in which natural gas is used, a number of planing-mills, flouring-mills and woolen-mills, and several establishments for the manufacture of machinery. Population 1890, 8,734.

BUTLERAGE, otherwise called the *prisage* of wines, was a right exercised by the crown in England to take two tuns of wine from every ship (English or foreign) importing into England 20 tuns or more, which, by charter of Edward I, was exchanged into a duty of two shillings for every tun imported by merchant strangers, and called butlerage, because paid to the king's butler.

BUTOMUS, a genus of *Alismaceæ*, a family of aquatic monocotyledons, sometimes called marsh lilies, of which one species (*Butomus umbellatus*) is frequent in ditches and ponds in England, Ireland and many parts of Europe, but rare in Scotland. It is considered one of the most beautiful plants in the British flora. The leaves are all radical, 2 to 3 feet long, linear and triangular. The flowering stem bears a large umbel of rose-colored flowers.

BUTT, ISAAC, Irish patriot; born in County Donegal, Ireland, in 1813; died May 5, 1879. He was educated at Raphoe and at Trinity College, Dublin, where he gained a brilliant reputation for accomplished scholarship. He edited the *Dublin University Magazine* from 1834 to 1838, and filled the chair of political economy in his university from 1836 to 1841. Called to the Irish bar in 1838, he soon became the champion of the Conservative cause, actively opposing O'Connell's Repeal Association in 1843. His political conversion occurred early, for in 1852 he was returned as a Liberal Conservative for Youghal, for which constituency he sat until 1865. He defended Smith O'Brien and others in the state trials of 1848, and all the Fenian prisoners between the years 1865 and 1869. Butt was the first to make political capital of the phrase "HOME RULE," and in 1871 he was returned for the city of Limerick to take the lead of the Home Rule party in the House of Commons, but was unable to control the forces he had formed. He was the author of several legal treatises of note, among them *Practical Treatise on the Law of Compensation to Tenants in Ireland* (1871). See also HOME RULE in these Supplements.

BUTTE CITY, a city, capital of Silver Bow County, southwest Montana, 65 miles S. of Helena, on the Butte, Anaconda and Pacific, the Great Northern, the Montana Union, the Northern Pacific, and the Union Pacific railroads. It derived its name from its proximity to a lofty mountain peak, called Big Butte, half a mile west of the present city limits. It is preeminently a mining-town, having a large output of gold, silver and copper. The principal public buildings are the courthouse, opera-house, high school, St. James's Hospital, and St. James's Parochial School. The city is well supplied with water, has two electric-light companies, a gas company, a public library, good sewerage and three lines of street-railways, one using a cable and another electricity as the motive power. The population has increased from 3,363 in 1880 to 10,723 in 1890.

BUTTER. Within recent years the methods of making butter have undergone very radical changes. The markets were formerly supplied entirely by the home-made article, but since the advent of creameries these have proved so popular and have increased so extensively that a large part of the butter now sold is their product. Prior to about 1885 the creamery of to-day was not in existence. No branch of agricultural business has made such rapid strides as that of dairying, especially in the Western country. There are still a great many of the set-milk and gathered-cream plants in operation, the latter predominating, but they are being gradually replaced by those conducted under the separation process. The modern creamery contains the latest improved separators, churns and butter-workers, and employs skillful and experienced men to operate them, and are conducted either by individuals, stock companies or co-operative companies. The latter are managed and controlled by those who contribute the milk, a share in the profits being taken in preference to an outright sale.

To make a success of the business now requires that a butter-maker thoroughly educated in dairy lines shall be at the head of affairs. He must not

only know what constitutes a good butter-producing cow, but must understand how to feed the dairy herd to produce the best results. The patron must be instructed in the best methods of taking care of the milk previous to bringing it to the factory. Upon presentation of milk or cream, quick judgment must be exercised as to its purity and good condition. A sufficient knowledge of analytical chemistry must be acquired to conduct analyses for fats and solids. The expensive and complicated character of the machinery used requires a knowledge of machinery and of engineering. The improvement of the flavor of butter is so delicate an undertaking that only one acquainted with the action of the different ferments and pure cultures can expect to handle them to the best advantage. From the time the milk reaches the creamery until the butter is packed and set away in the refrigerator, scientific methods must prevail. The perfect butter must be of a fine, quick flavor, free from mottles, streaks and white specks, and must have good body, grain and color, and the keeping qualities that will allow it to be held in storage or exported.

There are no specific rules that can be laid down for butter-makers in every locality to follow. It is a part of the business of the manager of a creamery to study the effects of different methods and to adopt the ones best suited to his purposes and surroundings. All good authorities unite on the principle that to make fine butter the milk must be fine to commence with. No scientific methods have been found to overcome the bad effects produced in the milk by either improper food or negligent attention. There are various ways of ripening and handling the cream and butter that materially decrease these bad effects, but no process that will entirely obliterate them has been so far discovered. After the milk has had proper care on the farm, and is delivered to the creamery in perfect condition, it rests with the operator as to what grade of butter he shall make. The milk is usually run through the separator at from 75° to 80° F. This insures perfect separation of the cream from the milk. The cream is then cooled down to the ripening temperature, which, in winter, is from 64° to 68°; in summer about 60°. These temperatures are governed by the amount of acid the cream contains after separation, which is ascertained by the use of alkali tablets. The per cent of acid is learned by neutralizing the acid in the cream with the alkali, noting the amount of the alkali necessary to accomplish this result. After the cream has developed the requisite amount of acid, the temperature should be reduced from 56° to 58° in winter and from 50° to 52° in summer, and should be churned at the time of reaching the desired temperature. The churning is completed when the granules have become separated from the milk and have the appearance of needle-points. The buttermilk is then drawn off and the butter washed in one or two waters, which should be of a temperature to keep the butter about as cool as when the churning was completed. The modern creamery has the combined churn and worker, by the use of which the butter is not exposed to the air until it is being placed in the packages. After the butter is washed it should be salted with fine, pure and clean salt, the amount to be used varying somewhat in different localities, one ounce to the pound being about the average. The principal feature of the manufacture and keeping of gilt-edge butter is having control of the temperature of the milk from the time that it is drawn from the cow until the churning is completed, and then giving to the butter the same careful attention. The acid in the cream must also be controlled during the ripening process, for at this time the flavor can be developed or destroyed. If these two points are carefully attended to, if the milk is given the proper care while at the farm, and the butter is properly worked and churned, an article will be produced that will command a good price wherever offered for sale. The facilities for shipping butter have been so improved since the advent of the creamery that now the butter can be loaded into a refrigerator-car at the door of the creamery, and within a few days landed in good condition at any of the principal butter markets of the United States. Great advances have also been made in the methods of holding butter for future sale and consumption. All of the principal market centers have cold-storage houses, where butter is frozen solid, and kept for an indefinite time without materially affecting the fine flavor. This method of refrigeration has been the means of creating a more even price for butter throughout the year, previous to the adoption of which butter would be worth double the price in winter at which it sold in summer. The leading butter markets of this country are Chicago, New York and Boston, in all of which cities immense amounts of the choicest creamery products are kept in storage at all times. The business is mostly done by firms dealing exclusively in butter and selling the same on commission. Creameries are charged a commission of five per cent, which, with the freight added, would make the cost of marketing a pound of butter about 2½ cents on an average. For all markets, save that of Boston, the packages in which butter is shipped are made of ash, but for the city mentioned they are made of spruce.

ARTIFICIAL BUTTER. The base of artificial butter is oleo-oil, a product of pure beef-fat, or suet. So cheaply can artificial butter be made, that soon after its introduction in 1870, it became a strong competitor of the genuine article, and was sold as pure butter to such an extent as to make serious inroads on the dairying interests of the country. In August, 1886, Congress passed what was known as the Oleomargarine Act, by the provisions of which manufacturers were assessed a yearly tax of $600, wholesalers $480, and retailers $48. In addition to this, both the home and foreign article was subjected to a stamp duty, and, wherever sold, the artificial article was to be plainly labeled as such, and in no event to be sold as pure butter. In addition to this general law, many of the states have enacted legislation against both the manufacture and sale of artificial butter. A determined effort to break down these laws has been made by the manufacturers of oleomargarine, but the courts have sustained the legislation in all instances, the court of appeals of New

York, where the most restrictions were placed on the business, upholding the law in its entirety. Butterine is the trade name adopted for artificial butter, regardless of the ingredients used, but the United States government recognizes the product under the name of oleomargarine. See BUTTER, Vol. IV, pp. 590–592; also DAIRY, Vol. VI, pp. 770, 771.

BUTTER, in old chemistry, applied to certain metallic substances which have an oily aspect and consistence, resembling melted butter; such as butter of antimony, bismuth, zinc and tin. It is often applied generically to any substance of the consistence of butter; and is therefore used to designate palm, cocoanut, shea and nutmeg oils, called "vegetable butters."

BUTTER-BUR (*Petasites vulgaris*), a perennial composite, common in wet meadows and beside streams. The small subdiœcious whitish purple flower-heads are borne in exuberant racemose masses, which come up like those of its ally, colt's-foot (*Tussilago*), in early spring, before the leaves.

BUTTERCUP, a name given to one or more of the common species of *Ranunculus*. See RANUNCULUS, Vol. XX, p. 272.

BUTTERFIELD, DANIEL, soldier; born in Utica, New York, Oct. 31, 1831; graduated at Union College, and then became a merchant in New York City. When the Civil War began, as colonel of the Twelfth New York regiment he accompanied it to Washington (July, 1861), and led the advance into Virginia, joining General Patterson on the Upper Potomac. He fought in the divisions of Fitz-John Porter, Pope and McClernand, and was in the battles of Hanover Courthouse, Mechanicsville, Gaines Mills, Fredericksburg, Chancellorsville, Gettysburg (where he was wounded), Mission Ridge, Buzzard's Roost, Dallas, New Hope Church, Kenesaw and Lost Mountains, and others. His rank was frequently raised, and he was brevetted brigadier and major general for meritorious conduct. After the war he was superintendent of the general recruiting service in New York City, and commanded the New York harbor forces from 1865 to 1869. Resigning from the army, he was placed at the head of the United States subtreasury in New York.

BUTTERFLY-WEED OR PLEURISY-ROOT (*Asclepias tuberosa*), a North American plant, of which the root has considerable medicinal repute, the infusion being used as a diaphoretic and expectorant. It is one of the large genus of "milkweeds," and is notable among them for its showy bright orange flower-clusters. The name *butterfly-pea* is applied to several leguminous plants, notably *Clitoria Mariana*, and its ally, *Centrosema Virginiana*.

BUTTERNUT OR WHITE WALNUT, an American tree (*Juglans cinerea*) of the walnut family. The nut is long, pointed and with very rugged ridges. The light-colored wood takes a beautiful polish and is much used in interior and cabinet work, contrasting strongly with its nearest ally, the black walnut (*J. nigra*).

BUTTER ROCK OR HALOTRICHITE, a mineral which may be regarded as a variety of alum—an iron alum, appearing as a pasty exudation from rocks that contain alum or its constituents, particularly alum-slate and other schistose rocks. Rock-butter occurs at Hurlet alum-works, near Paisley, Scotland, and in a number of places on the continent of Europe. It is not unlike butter in color, is silky-fibrous, and has an astringent taste.

BUTTER TREE, a name especially applied to *Bassia*, a genus of tropical or subtropical trees of the family *Sapotaceæ*, remarkable for the abundance of oil or butyraceous fat which the seeds contain, and which is used for many purposes by the inhabitants of the countries where they are indigenous. The butter tree described by Mungo Park as growing in the interior of Africa, in the country of Bambarra, belongs to this or a nearly allied genus. It produces the galam-butter, also called shea-butter, which is highly valued, and forms an important article of commerce in the interior of Africa. The mahwa tree of India (*Bassia latifolia*) attains a height of 40 to 60 feet, and is a valuable timber tree. Its flowers are eaten raw, and have a luscious taste when fresh; when dry, they resemble figs in flavor. One tree sometimes produces as much as 800 pounds of flowers. The Indian butter tree, or fulwa tree (*Bassia butyracea*) a native of Nepaul, attains a height of 50 feet. Its timber is light and of no value. The fruit is of the size of a pigeon's egg, and, although eaten, is not much esteemed; but from the seed a concrete oil or butter is obtained, much valued for medicinal uses. *Bassia longïfolia*, a native of Coromandel, yields a large quantity of oil; the flowers are much esteemed for eating, and the wood is almost as hard and durable as teak. The name *butter-tree* is also given to other tropical trees, belonging to quite different orders, the fruits of which yield fixed oils. See also OILS, Vol. XVII, p. 747.

BUTTERWORT, a name common to the several species of *Pinguicula*, a genus of the family *Lentibulariaceæ*, growing in wet ground. The plants send up a one-flowered scape from a rosette of radical leaves. The common butterwort (*Pinguicula vulgaris*) is abundant in the northern parts of Britain and Europe, and grows also in Canada and the eastern United States. Its leaves are covered with stalked glands, which yield a viscous, insect-catching secretion. The edges of the leaf roll over on the insect and retain it, and it is supposed that insects so caught serve as food for the plant. This secretion contains acid and pepsin, and has active digestive properties. Hence it has the power of coagulating milk, and is used for this purpose by the Laplanders. Some species possess flowers of much beauty, especially *Pinguicula grandiflora*. North and South America have several species of butterwort. See INSECTIVOROUS PLANTS, Vol. XIII, p. 137.

BUTTERWORTH, BENJAMIN, lawyer; born in Warren county, Ohio, Oct. 22, 1837; was educated at Ohio University, admitted to the bar in 1861, and practiced law in Cincinnati. In 1870 he became United States district attorney, and in 1873–74 state senator. He was elected to Congress in 1878 and 1880, became commissioner of patents in September, 1883, and in 1884 was again elected to Congress, where he represented the first Ohio district as a Republican until 1890. He afterward held the po-

sition of solicitor to the World's Columbian Exposition. Appointed Commissioner of Patents in 1897.

BUTTLAR, Eva, fanatic; born in Eschwege, Hesse, in 1670; died near Hamburg in 1717 or 1718; converted at the court of Eisenach to a religious life by Vockerodt of Gotha, the Pietist, she left her husband and the court and returned to Eschwege. Here she formed a congregation of so-called "New Christians." These she led to believe that she was the Holy Ghost, and later the woman who was to give birth to the new Christ. The immoral teachings and practices of her followers brought upon them universal condemnation, and they survived but twelve years.

BUTTON-BUSH, a name commonly applied to the North American shrub *Caphalanthus occidentalis*, of the family *Rubiaceæ*, on account of the compact round heads of white flowers; also somewhat generally applied to plants with similar compact heads. The species of *Diodia*, another genus of the same family, for a similar reason, are called "button-weeds"; also the common plane tree, or American sycamore (*Platanus occidentalis*), is called "button ball," from its small round heads of flowers or fruit.

BUTTONWOOD, PLANE TREE, or SYCAMORE. See Arborculture, Vol. II, p. 317.

BUTTS, Isaac, journalist; born in Washington, Dutchess County, New York, Jan. 11, 1816; died in Rochester, New York, Nov. 20, 1874. He was educated at Rochester high school, engaged in various pursuits, and in 1845 assumed editorship of the Rochester *Advertiser*, the oldest daily newspaper in the United States, west of Albany. The paper was Democratic in politics, and as the question came up in Congress at this time whether slavery should be allowed in the territory newly acquired from Mexico, Mr. Butts took the ground that the people of the territory should settle the matter themselves. "Popular Sovereignty," or "Squatter Sovereignty," was the principle, and the phrase originated in Mr. Butts's paper (Feb. 8, 1847), although Daniel S. Dickinson, Lewis Cass and Stephen A. Douglas respectively claimed the honor. Mr. Butts sold the *Advertiser* in 1848, and for four years was engaged in the service of the "House Printing Telegraph Company" and in the construction of lines which converged at St. Louis. In the latter part of 1852 he purchased an interest in the Rochester *Union*. Five years later the *Advertiser* was incorporated with it, and Mr. Butts continued as editor until 1864, when he permanently retired. He was an organizer, and for years one of the managers, of the Western Union Telegraph Company. His volume on *Protection and Free Trade*, with a memoir, was published after his death.

BUTYRIC ACID, volatile fatty acid, first prepared by Chevreul, by treating butter with an alkali. It has a strong, rancid smell and acrid taste. It occurs also in the juice of meat, in various fats, among the intestinal ferments in the process of digestion, and in perspiration. See Chemistry, Vol. V, p. 569.

BUTYRIC ETHER or ARTIFICIAL PINEAPPLE OIL, a fragrant oil obtained by distilling butyric acid, alcohol and sulphuric acid. The material which passes over is the butyric ether, which is usually prepared for commerce by being mixed with alcohol. It possesses the flavor of pineapples, and is extensively used for flavoring confections, for sophisticating bad rum, and for flavoring ices, creams, etc.

BUXBAUMIA, a genus of *acrocarpous* (see under Bryum) mosses, containing but two species, so far as known. *B. aphylla* is peculiar in apparently having no leaves, the whole plant appearing to consist of a small capsule. In this case the gametophyte has become very much reduced, and the sporophyte has assumed relatively very large proportions. See Alternation of Generations, in these Supplements.

BUYS-BALLOT, Christoph, meteorologist; born at Kloetingen, in Zealand, Oct. 10, 1817; died at Utrecht, Feb. 2, 1890. He studied at Utrecht, where he subsequently became professor of mathematics (1847) and of experimental physics (1850), and in 1854 director of the Royal Meteorological Institute. He was one of the initiators of the new system under which, by daily synoptical weather reports, and by simultaneous observations by land and by sea, materials are collected for forecasting changes; his own observations have resulted in the determination of a general law of storms, known as Buys-Ballot's law (see Atmosphere, Vol. III, p. 29). The inventor of the aëroklinoscope, and of a system of weather-signals, he has been largely instrumental in bringing about an international uniformity in meteorological observations. His works include *Changements Périodiques de la Température* (Utrecht, 1847), and in English, *Suggestions on a Uniform System of Meteorological Observations* (1872–73).

BUYUKDEREH or BAJUKDERE, a village beautifully situated on the Bosporus, 10 miles N.E. of Constantinople. It forms the summer residence of many of the ambassadors of the Christian powers, some of whom have splendid mansions here.

BUZZARD'S BAY, an inlet on the southeast coast of Massachusetts; extends 30 miles N.E. from the Atlantic Ocean; 5 to 10 miles wide; separated from Vineyard Sound by Elizabeth Islands. Wareham, New Bedford and Fairhaven harbors are contained in it.

BYBLOS, an ancient city of Phœnicia, at present a village of 600 inhabitants, called Jebeil. See Jebeil, Vol. XIII, p. 613.

BYERLY, William Elwood, mathematician; born in Philadelphia, Pennsylvania, Dec. 13, 1849; in 1871 graduated at Harvard College; from 1873 to 1876 was assistant professor of mathematics at Cornell University; in 1876–81 held a similar position at Harvard College; became full professor in 1881. He has published several mathematical writings, among them *Elements of Integral Calculus* and *Elements of Differential Calculus*.

BYFORD, William Heath, physician; born in Ohio, March 20, 1817; died in Chicago, May 21, 1890; graduated at Ohio Medical College in 1844. In 1857 he became professor of obstetrics in Rush Medical College, and in 1880 professor of gynæcology there. In 1862 he was chosen president of

the Woman's Medical College of Chicago. His volume on *Theory and Practice of Obstetrics* (1870) obtained a wide circulation among physicians.

BY-LAWS, the private regulations which are made by a legislative body, a corporation or a society for its government. They differ from provisions of its constitution, in that they are more particular and more readily altered. By-laws are binding unless contrary to the laws of the land, or to the charter or act of incorporation, or unless they are manifestly unreasonable.

BYLES, SIR JOHN BARNARD, English jurist and author, was born at Stowmarket, Suffolk, in 1801, and died in England, Feb. 3, 1884. He was called to the bar of the Inner Temple, London, in 1831; passed some years on the Norfolk circuit; and in 1840 was appointed Recorder of Buckingham. In 1843 he became a serjeant-at-law, in 1857 a queen's serjeant, and in 1858 was elevated to the bench as one of the judges of the Court of Common Pleas. In the latter year he received the honor of knighthood. He resigned his judgeship in 1873, and was sworn of the Privy Council. Mr. Justice Byles was the author of several professional works of high repute, his best known treatise being that *On the Law of Bills of Exchange* (1829; new edition, 1885). He was also the author of a brochure, entitled *Sophisms of Free Trade Examined* (1849; new edition, 1881); and of a work, which appeared in 1875, entitled *The Foundation of Religion in the Mind and Heart of Man.*

BYLES, MATHER, clergyman; born in Boston, Massachusetts, March 26, 1706; died there, July 5, 1788; descendant of Richard Mather and John Cotton; was graduated at Harvard College in 1725; entered the ministry and was assigned to Hollis Street Congregational Church, Boston, in 1733; remained there until 1776, when, on account of his loyalty to England, he was compelled to resign. He was tried in 1777 on the charge of receiving British officers at his home and of offering prayer for the King. He pleaded guilty and was ordered to leave for England. This sentence was commuted and he was guarded in his own home. Mr. Byles was an eloquent speaker, was noted for his wit and conversational powers, and was a frequent writer of verse. His *Miscellaneous Poems* were published in 1744.

BYNG INLET, a village and port of entry in the Algoma district, northwest Ontario, Canada, on Georgian Bay, 90 miles N. of Collingwood, at the mouth of Maganetawan River; an important lumbering-point. Population, about 400.

BYRD, WILLIAM, author and traveler; born in Westover, Virginia, March 16, 1674; died there, Aug. 26, 1744. He was educated in England, and there studied law, but returned to reside on his American estates, and long held important offices in Virginia. He collected a valuable library, was the founder of Richmond and Petersburg, and was one of the commissioners appointed to settle the boundary line between Virginia and North Carolina. He was author of valuable papers relative to the boundary-line settlement and description of his travels in Virginia. A part of his writings was published as *The Westover Manuscripts* (1841).

BYRGIUS, JUSTUS, OR JOST BURGI, the inventor of various astronomical instruments; born at Lichtensteg, in the Swiss canton of St. Gall, in 1552; died 1633. In 1579 he entered the service of the learned Landgrave of Hesse, Wilhelm IV, and in 1604 that of the Emperor Rudolf II. His first work was a celestial globe, in which the stars were placed according to his own observations. He is also credited with being one of the original inventors of logarithms (q.v., Vol. XIV, p. 775).

BYRNE, ANDREW, Roman Catholic bishop; born in Navan, Ireland, in 1802; died at Little Rock, Arkansas, 1862. He was educated at the college of his native town, and came to America in 1820 with Bishop England, who visited Ireland for the purpose of securing Catholic missionaries for the work in America. Byrne was ordained in 1827, and assigned to duty in North and South Carolina. In 1836 he was appointed to pastoral work in New York City, and in 1844 was made the first bishop of the diocese of Little Rock. He made three visits to Ireland, on the last two of which he secured the services of priests and sisters of mercy to assist in his work. Through his efforts the Catholic schools and churches increased in numbers, and their prosperity was greatly promoted.

BYRON, HENRY JAMES, dramatist; born in Manchester, England, in 1834; died in London, April 11, 1884. He entered the Middle Temple in 1858, and was for many years a prolific and popular writer of burlesque and extravaganzas. He also wrote extensively for periodicals, was the first editor of *Fun*, and occasionally himself appeared in the presentation of his plays. Of his plays the best was *Cyril's Success* (1868), and the most successful, *Our Boys*, which had an unprecedented run in London from Jan. 16, 1875, to April 18, 1879. Its success in the United States has been pronounced.

BYSSUS, a genus of plants established by Linnæus to include filamentous cryptogams in general, which he was unable to further differentiate. Naturally the name has long since been abandoned, and the various *Algæ* and *Fungi* included under it relegated to more rational genera.

BYSSUS, a name applied to a structure in certain bivalve mollusks which serves to attach the animal to foreign objects. It consists of a number of filaments which are attached to the foot. These are secreted by a gland, at first in the form of a fluid uncus, which soon hardens and attaches the animal either temporarily or permanently.

BYZANTINE ART. See ARCHITECTURE, Vol. II, pp. 422, 429 and 434; VENICE, Vol. XXIV, p. 148; SCHOOLS OF PAINTING, Vol. XXI, p. 433; MURAL DECORATION, Vol. XVII, p. 43; SCULPTURE, Vol. XXI, p. 556; and GLASS, Vol. X, p. 650.

BYZANTINE RECENSION, the name given the text of the Greek New Testament as propagated within the limits of the patriarchate of Constantinople. It was almost identical with the present text.

89094372885

B89094372885A




b89094372885a