

138.—The suggestion of previous investigators that both the acid and neutral sulphates of thallium might be used in the estimation of this element has been carried out by the author with positive results. By treating thallium chloride with sulphuric acid and heating to constant weight at 220°–240° C., the salt was found to correspond to the acid sulphate. When heated to dull redness, sulphuric acid escaped, and when constant weight was again attained, the residue had the composition of the neutral sulphate.

**Laboratory Notes.** By J. M. CAMP. *Iron Age*, 65, 17–18.—In these notes are included detailed directions for the determination of phosphorus in coal and coke, and in ores, pig-iron, and steel which contain also arsenic. A method for the estimation of alumina in slags and ores is proposed, in which the aluminum is separated and weighed as aluminum phosphate.

**Silicon in Ferrosilicon.** By F. W. BAUER. *Iron Age*, 65, 3.—The percentages of silicon in a sample of ferrosilicon as reported by eleven chemists, working independently, are given, together with an outline of the method used by each. The results vary from 14.90 per cent. to 16.68 per cent. silicon.

**A Rapid Method for Determining Lime in Blast-furnace Slags.** By TITUS ULKE. *Eng. Min. J.*, 69, 164.—The sample of slag is dissolved in very dilute nitric acid, and any barium present is precipitated by the addition of a few drops of sulphuric acid. The solution is now made almost neutral with dilute ammonia, and the calcium precipitated by the addition of ammonium oxalate. This precipitate contains no iron or aluminum, and can be washed free from ammonium oxalate, dissolved, and oxidized with standard potassium permanganate solution. The entire analysis may be completed in from 15 to 20 minutes.

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## GEOLOGICAL AND MINERALOGICAL CHEMISTRY.

M. L. FULLER, REVIEWER.

**Some Analyses of Italian Volcanic Rocks, II.** By HENRY S. WASHINGTON. *Am. J. Sci.*, 159, 44–54.—1. Ciminite. From a trachytic flow at Monte Cimino, Viterbo. The mineral components of this rock as computed from the analyses are orthoclase 37.9 per cent., labradorite 26.5, diopside 16.5, olivine 17.3, and magnetite 1.8. This would place the rock between the trachytes and the andesites and basalts in the group of andesitic trachytes or trachydolrites of Rosenbusch (latite of Ransome). 2. Selagite. This is a lamprophyric latite occurring as a volcanic neck in Tertiary marls, Monte Catini, Tuscany. The analyses

are almost identical with those of ciminite, though the diverse conditions of consolidation have resulted in the formation of a different set of minerals; the selagite carrying less olivine, orthoclase, and a plagioclase of less lime, but containing at the same time more augite and an abundance of biotite. It affords a good illustration of the tendency of the complex biotite molecule to crystallize as biotite in intrusions while it splits up into olivine, orthoclase, leucite, etc., in extrusions. Compared with biotite-vulsinite, selagite shows the additional presence of olivine, the available supply of  $MgO$  in the magma of the former being exhausted by the crystallization of the biotite and augite. The chemical relations of selagite to venanzite, madupite, wyomingite, and orendite are also discussed. 3. Andesite. From a volcanic neck in Pliocene marls, Radicofani, Tuscany. The new analyses lead the author to consider the rocks examined as basic andesites rather than ciminites, as he has previously held. 4. Leucitite. From a surface flow at Capo di Bove, Alban Hills. Calculations based upon the analyses, aided by physical examination, give the probable mineral composition as leucite 52 per cent., nephelite 10, melilite 17, diopside 17, and magnetite 4. Comparison is made between the composition of the leucitite in question and that of Bearpaw Mt., Montana, and also with venanzite.

**Mineral Resources of the Province of New Brunswick.** By L. W. BAILEY. *Geol. Surv., Canada, Ann. Rep.*, 10, Part M, 1-128.—In addition to exhaustive statistics, some twenty analyses, including magnetite, graphite, limestone, gypsum, mineral waters, and ores of antimony and manganese, are given.

**Annual Report for Section of Mineral Statistics and Mines.** By E. D. INGALL. *Geol. Surv., Canada, Ann. Rep.*, 10, Part S, 1-230.—A considerable portion of the report is devoted to the iron ores. Ten analyses of the chromic iron ores of Quebec, and over 150 analyses of the Nova Scotia ores, are given. Of the latter, some 50 are published for the first time.

**Illinois Gulch Meteorite.** By H. L. PRESTON. *Am. J. Sci.*, 159, 201-202.—This meteorite was found some 4 feet below the surface in Deer Lodge County, Montana, and measured  $63 \times 104 \times 105$  mm. A physical examination showed the presence of troilite and a dark steel-gray crystalline mineral supposed to be rhabdite. The analysis of the ground mass showed the presence of 92.51 per cent. of iron, 6.70 per cent. of nickel, and small amounts of cobalt, phosphorus, carbon, and silica.

**Granodiorite and Other Intermediate Rocks.** By WALDEMAR LINDGREN. *Am. J. Sci.*, 159, 269-282.—This paper has

in view the fixing of the position of granodiorite in relation to allied granitic rocks. A somewhat detailed consideration of its chemical and mineralogical composition is given, accompanied by a discussion of its relations to granite, diorite, monzonite, tonalite, banatite, etc. The conclusions reached are that the granodiorite is to be considered as a granular rock with, perhaps, an average composition of quartz 23 per cent., soda-lime feldspars 44 per cent., alkali feldspars 8 to 20 per cent., and ferro-magnesian silicates 14 per cent. The family is regarded as being clearly defined, and is of wide distribution along the Pacific slopes of the Cordilleran ranges.

**Two New American Meteorites.** By H. L. PRESTON. *Am. J. Sci.*, 159, 283-286.—The first of the meteorites described was found at Luis Lopez, New Mexico, and weighed 6.9 kilograms. The sections showed nodules of troilite, streaks and seams of troilite and schreibersite, and rhomboidal patches of plessite composed of alternating layers of kamacite and tænite. The surface was covered with a somewhat lustrous reddish brown crust and was deeply pitted. The analysis showed 91.312 per cent. of Fe, 8.170 per cent. of Ni, and small amounts of Co, P, S, and C. The second of the meteorites, which came from central Missouri, probably weighed about 25 kilograms and is of the same general character as the preceding. The analysis differed from the former in having some 3.42 per cent. more iron and 3.55 per cent. less nickel, the other constituents being nearly the same in both.

**Coal Analyses.** By GEORGE HALL ASHLEY. *Dept. Geol. and Natural Resources of Indiana, Ann. Rep.*, 23, 1565-1573.

**Geology of Story County, Iowa.** By S. W. BEYER. *Iowa Geol. Surv., Ann. Rep.*, 9, 155-237.—Sanitary and chemical analyses, together with the probable mineral combinations, are given for certain of the artesian waters occurring in the county.

**Geology of Scott County, Iowa.** By W. H. NORTON. *Iowa Geol. Surv., Ann. Rep.*, 9, 389-519.—Several analyses of artesian waters from the Galena, Saint Peter, and underlying formations are included in this report.

**Artesian Wells of the Belle Plaine Area, Iowa.** By H. R. MOSNAT. *Iowa Geol. Surv., Ann. Rep.*, 9, 521-562.—The discussion is mainly geological but a number of analyses are given.

**Minnesota Iron Mining Economically and Statistically Considered.** By HORACE V. WINCHELL. *Minn. Geol. Surv., Final Rep.*, 4, 581-616.—Some 200 analyses of the Lake Superior iron ores for 1898 and 1899 are given. Of these the Gogebic range

furnished about 40, Menominee range 40, Marquette 65, Mesabi 45, and Vermilion range 10.

**Ore-bearing Schists of Middle and Northern Cape Breton.**

By J. EDMUND WOODMAN. *Dept. Mines, Nova Scotia, Rep. 1898*, 1-39.—In addition to the description of the ore-bearing schists, the author discusses briefly the question of the origin of the metalliferous minerals, which he regards in general as due to solfatitic action.

**Coal in Lower Michigan.** By ALFRED C. LANE. *Mich. Miner.* 1, Nos. 3-10.—This paper is a semi-popular, but thoroughly scientific discussion of the origin, occurrence, erosion, disturbance, and economic development of coal in Lower Michigan. In an appendix there are descriptions of the methods of both proximate and ultimate analyses of coals and of the analysis of ash, together with a discussion of the determination of the heating power, both directly and from proximate analyses.

**Magmatic Differentiation in the Rocks of the Copper-bearing Series.** By ALFRED C. LANE. *Bull. Geol. Soc. Am.*, 10, 15-18.—This paper treats of the chemical and mineralogical variations in the effusive flows constituting the copper-bearing rocks of the Lake Superior region, and discusses their causes. A number of analyses of the upper and lower parts of the flows, and of normal and quartziferous basic intrusives are given.

**Formation of Dikes and Veins.** By N. S. SHALER. *Bull. Geol. Soc. Am.*, 10, 253-262.—1. Dikes. The author divides dikes into (1) those which have followed preexisting joints or bedding planes, and (2) those which have burrowed their way through the rock independently of fracture lines. The many cases in which the former have apparently followed the lines of more difficult rather than those of less difficult passage leads him to reject hydrostatic pressure as the principal cause of the penetration of the molten material. The conclusions reached are that the sudden conversion of the water of the fissures into steam by contact with the molten material of the dike is the true explanation of the opening of the passage ways for the latter. The passages for the material of dikes of the second class are considered to have resulted from the progressive melting and absorption of the walls by the advancing magma. 2. Veins. The author considers that open fissures could not exist at the depths at which ordinary veins were probably formed, but regards the filling as the result of lateral secretion, the walls being pressed backward by the expansive force of crystallization. Veins of this nature, although apparently presented by the author as a new type, belong to a well-recognized class of deposits. Few would agree

with the author, however, in going to the extreme of referring so large a proportion of veins to an origin by lateral secretion.

**Physiography and Geology of the Region Adjacent to the Nicaragua Canal Route.** By C. WILLARD HAYES. *Bull. Geol. Soc. Am.*, 10, 285-348.—One of the most conspicuous and important of the geological features along the canal route is the rock decay. The types prevailing on the opposite side of the isthmus are widely different, and are the natural result of the climatic conditions. In the Eastern Division there is a heavy rainfall distributed throughout the year, the surface is covered by dense forests, and the soil and rock are thoroughly saturated with water. As a result, the decomposition extends to great depths. The resulting soils present a deep red color near the surface, but graduate downward, first through a blue clay, then through the soft rock (saprolite), and finally into the undecomposed rock at the bottom. In the Western Division the wet and dry seasons alternate. During the dry season numerous cracks are formed in the soil by shrinkage. Into these cracks a considerable quantity of vegetable matter finds its way, and, upon the return of the wet season and the closing of the cracks, is incorporated in the soil, where its action is to prevent the oxidation of the iron. The result is that the red colors so characteristic of the Eastern Division are entirely wanting. The rate of weathering is much slower than in the Eastern Division.

**Notes on the Drift of Northwestern Iowa.** By H. F. BAIN. *Am. Geol.*, 23, 168-176.—In connection with attempts to discriminate between the Kansan and the younger glacial deposits, a study was made of the chemical weathering of the drift. Both the older and the younger drifts were derived largely from limestone rocks, but in the older all traces of lime have now been removed by solution, leaving a siliceous, iron-stained mass behind. The difference is sufficiently general to be of value in the correlation of the various Kansan exposures.

**Notes on the Cretaceous and Associated Clays of Middle Georgia.** By GEORGE F. LADD. *Am. Geol.*, 23, 240-249.—The various Cretaceous and Tertiary clays of the Coastal Plain are described, and a number of chemical and mineralogical analyses made by the author are given.

**Origin and Age of Certain Gold "Pocket" Deposits in Northern California.** By O. H. HERSHY. *Am. Geol.*, 24, 38-43.—The deposits in question are located in Trinity County and vicinity, and occur in a black slate of Jurassic age, which is known locally as "porphyry." Underlying the slates is a great massif of diabase in which the gold often assays as high as \$2 or

\$3 a ton. During Carboniferous times this mass was exposed to the atmospheric agencies and was deeply eroded by subaerial denudation, the insoluble gold accumulating in the resulting soil, especially in the depressions or pockets. During the subsequent subsidence and advance of the sea the gold is assumed to have been further concentrated in the depressions, where it was finally covered by the deposits of slate. The author explains the coarse condition of the gold in the pockets as compared with that in the veins and amygdalites as probably due to the combination of many separate grains through fusion, brought about by the friction, etc., accompanying the metamorphism of portions of the slate.

**The Gold-bearing Formation of Stephenson County, Ill.** By OSCAR H. HERSHAY. *Am. Geol.*, 24, 240-244.—The gold, which is not present in economic quantities, occurs as impregnations in one or more strata of the Utica series. The author considers the material to have been in a finely divided and disseminated state in the same or closely adjacent strata, and to have been afterwards concentrated through the agency of solutions traversing the strata laterally.

**A Discussion of the Use of the Terms Rock-weathering, Serpentinization, and Hydrometamorphism.** By GEO. P. MERRILL. *Am. Geol.*, 24, 244-250.

**Notes on the Corundum-bearing Rocks of Eastern Ontario, Canada.** By WILLET G. MILLER. *Am. Geol.*, 24, 276-282.—The corundum occurs in four different igneous rocks: syenite, syenite pegmatite, nepheline syenite, and anorthosyte. A number of analyses of the anorthosyte, one of which is new, and new analyses of bytownite and hornblende are given.

**Some Further Notes on the Weathering of Diabase in the Vicinity of Chatham, Virginia.** By THOMAS L. WATSON. *Am. Geol.*, 24, 355-369.—The paper presents the results of a careful study of the nature and results of the weathering of diabase. A considerable number of analyses of both fresh and decomposed rocks are given. The tabulated results show a loss in weathering of from 14.93 per cent. (diabase from Medford, Mass.) to 70.31 (olivine diabase from Chatham, Va.). In the decomposition of the Chatham diabase, iron is the constant factor, the alumina which is often selected as the factor, showing in this case a distinct loss.

**The Blue Mound Quartzite.** By GEO. D. HUBBARD. *Am. Geol.*, 25, 163-168.—This quartzite occurs as a capping on Blue and East Mounds, in Iowa and Dane Counties, Wisconsin, and

is probably to be regarded as a remnant of a stratum once continuous over most of the southwestern portion of the state. The author considers the stratum to be the remnant of a highly siliceous Niagara limestone, the calcareous matter of which has been removed by solution, the silica at the same time being deposited in the compact form which it now presents.