

Mr. Biernbaum reported a trip taken with Mr. Hallowell, to Moore, Delaware County, where they found cyanite. Mr. Blank exhibited sillimanite from the Wissahickon.

SAMUEL G. GORDON, *Secretary*.

BOOK REVIEW

MINÉRALOGIE DE MADAGASCAR. A. LACROIX. *Paris*. A. Challamel. Vol. I, xvi+624 pages, 27 plates, 1 map in colors, and 504 figures. Vol. II, vii+694 pages, 29 plates, and 11 figures. 1922.

The first part of this two volume work (pp. 1-148, vol. I) is a description of the GEOLOGY AND GEOGRAPHY of Madagascar.

In part 2, MINERALOGY (pp. 149-604, vol. I), the individual minerals (195 in number) found on the island are discussed in systematic order. A general description of each mineral is followed by detailed particulars of its occurrences in Madagascar, with analyses and optical determinations, in a manner quite similar to that adopted by the author in his "MINÉRALOGIE DE LA FRANCE ET DE SES COLONIES." This section is illustrated by 27 excellent plates of photographs, and 504 crystal drawings. A large map of the island is found at the end of volume one.

ECONOMIC MINERALOGY is discussed in part 3 (pp. 1-218, vol. II). Here are described: deposits of precious metals, common metals, gems and ornamental stones, rare metals (including radioactive minerals), mica, graphite and corundum, salt, etc., building stones, coal and petroleum. Next the writer treats of the mineral springs. Statistics of mineral production conclude this part. Part 3 contains 23 plates illustrative of mineral deposits and mining methods, as well as a number of sketch maps.

The fourth part of this work is entitled LITHOLOGY (pp. 219-665, vol. II). It includes descriptions of the intrusives of the crystalline massif, the schistose rocks, and post-Lias intrusives. Many analyses are given, and a number of plates illustrating thin sections of rocks. The detailed treatment of pegmatites, in which those of Madagascar are compared with other pegmatites the world over, may be especially mentioned.

This is in every way an excellent work. It is perhaps not too much to say that it can be regarded as a classic in the field of books on regional mineralogy.

E. F. H.

ABSTRACTS: CRYSTALLOGRAPHY

THE CRYSTALLOGRAPHY OF SOME HEAVY METAL ACIDS AND SALTS OF PYROCATECHIN. P. J. BEGER. *Centr. Mineral.*, 129-42, 1920.

This paper gives the crystallography and optical properties of the following: tri-pyrocatechin arsenic acid, its Cr, Co, and Ni salts; the Na salt of dipyrocatechin nickel acid, and the NH_4 salt of pyrocatechin molybdenum acid. E. F. H.

CRYSTALLOGRAPHIC PROPERTIES OF SULFONAL. H. SEIFERT. *Centr. Mineral.*, 97-101, 1920.

Sulfonal, $\text{C}_7\text{H}_{16}\text{S}_2\text{O}_4$ is monoclinic holohedral, $a:b:c = 1.563:1:1.446$, $\beta = 90^\circ 31'$. The habit is varied and dependent upon the solvent from which the substance is crystallized. E. F. H.

REGULAR GROWTHS OF CRYSTALS AND TWINNED INTER-GROWTHS. GEORG KALB. *Centr. Mineral.*, 285-8, 1920. REGULAR GROWTHS OF CRYSTALS AND CRYSTAL STRUCTURE. GEORG KALB, *ibid.*, 321-3, 1920.

The first is largely a critical discussion of Johnsen's paper on twins (*Neues Jahrb. Mineral.*, Beil.-Bd. 23, 237-344, 1907). In the second paper, from a review of Schmidt's study of parallel fibrous halite and gypsum (*Diss. Halle*, 1911) K. concludes that the crystals arrange themselves in oriented position on their support.

E. F. H.

FURTHER LAUE METHODS. R. GROSS. *Centr. Mineral.*, 52-64, 1920.

This paper describes an instrument for the measurement of Laue photographs, an apparatus for the Roentgenometric detn. of very small, crystallographically unorientable objects, and a method for the systematic investigation of the symmetry elements.

E. F. H.

THE CRYSTAL STRUCTURES OF WULFENITE AND SCHEELITE. ROSCOE G. DICKINSON. *J. Amer. Chem. Soc.*, 42, 85-93, 1920.

Studies of X-ray spectra from several crystal planes show that wulfenite and scheelite have probably a face-centered lattice, with the atoms so located as to form a "diamond" arrangement.

E. F. H.

THE CRYSTALLOGRAPHY OF MELEZITOSE. EDGAR T. WHERRY. *J. Amer. Chem. Soc.*, 42, 125-8, 1920.

Melezitose dihydrate ($C_{18}H_{32}O_{16} \cdot 2H_2O$) is orthorhombic, $a:b:c = 1.216:1:0.496$, forms a , b , d , e , m ; $\alpha = 1.540$, $\beta = 1.548$, $\gamma = 1.550$ (for Na); ext. parallel; $2E = 85^\circ$; opt. -; $X = a$, $Y = b$, $Z = c$.

E. F. H.

METHYL AND ETHYL AMMONIUM MERCURIC IODIDES: THEIR PREPARATION, CRYSTALLOGRAPHY, AND OPTICAL PROPERTIES. GEORGE S. JAMIESON AND EDGAR T. WHERRY. *J. Amer. Chem. Soc.*, 42, 136-45, 1920.

The crystallography and optical properties are given for: $(CH_3)_2NH.HI.HgI_2$ (monoclinic); $(C_2H_5)_2NH.HI.HgI_2$ (orthorhombic); $(CH_3)_3N.HI.HgI_2$ (orth.); $(C_2H_5)_3N.HI.HgI_2$ (mono.); $(CH_3)_4NI.HgI_2$ (orth.); and $(C_2H_5)_4NI.HgI_2$ (tetragonal).

E. F. H.

THE CRYSTAL STRUCTURE OF CAESIUM DICHLORO-IODIDE. RALPH W. G. WYCKOFF. *J. Amer. Chem. Soc.*, 42, 1100-16, 1920.

The body-centered unit rhombohedron contains one molecule of $CsCl_2I$. The disposition of the several atoms is given.

E. F. H.

RELATIONSHIPS BETWEEN GROWTH FORMS AND STRUCTURE OF CRYSTALS. PAUL NIGGLI. *Z. anorg. allgem. Chem.*, 110, 55-80, 1920; through *Chem. Abstr.*, 14, 3354, 1920.

The faces which attain maximum development in the growth of xls. correspond with the principal planes in the lattice structure. Faces with complex indices grow more swiftly than simpler faces. Calculations on a number of cubic xls. show that the theoretically most probable faces are those which do actually occur.

E. F. H.

THE MOLECULAR DIRECTING FORCE OF LIQUID CRYSTALS. O. LEHMANN. *Z. anorg. allgem. Chem.*, **113**, 253-300, 1920; through *Chem. Abstr.*, **15**, 2763, 1921.

The properties of liquid xls. are best accounted for on the assumption that they have a leaflet-like structure, the units of which endeavor, as far as possible, to lie parallel, but which can glide freely in a direction parallel to their faces. E. F. H.

THE CHEMISTRY AND CRYSTALLOGRAPHY OF SOME FLUORIDES OF COBALT, NICKEL, MANGANESE AND COPPER. FLOYD H. EDMINSTER AND HERMON C. COOPER. *J. Amer. Chem. Soc.*, **42**, 2419-34, 1920.

The acid fluorides of Co, Ni, and Mn, formula $RF_2 \cdot 5HF \cdot 6H_2O$, give rhombohedral crystals, with prismatic cleavage; opt. +. The Cu salt is probably monoclinic. E. F. H.

THE EFFECT OF ASYMMETRY: A STUDY IN CRYSTAL STRUCTURE. THOMAS V. BARKER AND MARY W. PORTER. *J. Chem. Soc., (Trans.)* **117**, 1303-21, 1920.

This investigation shows that racemic crystals of phenylbenzylmethylethylammonium mercuri-iodide are isomorphous with the corresponding diethyl derivative, although the racemic crystals contain two kinds of asymmetric molecules, while in the diethyl derivative all the molecules are identically similar and symmetrical. Crystallographic measurements and figures for nineteen compounds of alkylammonium, phenylalkylammonium and phenylbenzylalkylammonium are given. E. F. H.

MINERALOGY

MELTING AND TRANSFORMATION PHENOMENA OF SPODUMENE. F. MEISSNER. *Z. anorg. allgem. Chem.*, **110**, 187-95, 1920.

Natural (α) spodumene is slowly transformed into β -spodumene at temps. as low as 690°. With increasing velocity in rise of temp. the transformation temp. is raised. At ordinary pressures the transformation appears to be irreversible. E. F. H.

THE ARRANGEMENT OF THE ATOMS AND OPTICAL ROTATION IN QUARTZ AND SODIUM CHLORATE. J. BECKENKAMP. *Z. anorg. allgem. Chem.*, **110**, 290-310, 1920; through *Chem. Abstr.*, **14**, 3354, 1920.

A structure in which the Si atoms form a rhombohedral lattice is proposed for quartz. The spiral structure appears with the introduction of the O atoms. Their disposition is such that the orientation of valency directions is the same in horizontal or vertical molecular layers. This accounts for the optical rotation. The total structure is made up of nine 3-sided, prismatic lattices. The different kinds of twin xls. of quartz, and the relation of quartz to tridymite, β -quartz, and cristobalite are discussed. $NaClO_3$ has a structure similar to that of calcite, the Ca atoms being replaced by those of Na, C by Cl. E. F. H.

SULFUR IN COAL, GEOLOGICAL ASPECTS. GEO. H. ASHLEY. *Trans. Am. Inst. Mining Eng.*, **63**, 732-8, 1920.

A presentation of the various modes of occurrence of sulfur in coal.

A. S. WILKERSON.