Dr. Wills reported a trip to Moore Station, N. J. with Mr. Gordon, finding much stilbite. Mr. Boyle described an excursion to the French Creek mines, with Messrs. Clay, Jones, and Frankenfield. Very good apophyllite was obtained.

Samuel G. Gordon, *Secretary*

BOOK REVIEW

ELEMENTS OF OPTICAL MINERALOGY—AN INTRODUCTION TO MICROSCOPIC PETROGRAPHY. N. H. Winchell and A. N. Winchell. Second Edition, Part I, Principles and Methods, entirely rewritten and much enlarged by A. N. Winchell. Octavo, XVI + 216 pages, with 250 text figures. John Wiley and Sons, *New York*, 1922.

Since the publication of the first edition in 1908, many important advances in optical mineralogy have been made, among which are the methods developed for the study of mineral powders and fragments, and small crystals immersed in liquids. In this edition the author has endeavored to present not only the material necessary for the study of minerals occurring in thin sections but also in powders and fragments and involving immersion in liquids. Much of the text has been used for several years in the Extension Division of the University of Wisconsin, and therefore is based upon actual experience with students.

The fundamentals of crystallography, as applied to the microscopic study of minerals, are discussed in two chapters. The physical and chemical characters are then taken up, followed by chapters on the Elementary Conceptions of Optics, Optical Properties of Isotropic Minerals, Microscopes, Preparation of Material for Microscopic Study, and the Nicol Prism. The optical properties of isotropic, uniaxial, and biaxial minerals are then treated in detail.

The book is well written, the style being clear and concise. The illustrations are numerous and well chosen. The directions for laboratory work found at the end of many of the chapters form an important feature of the book. The text should serve as an excellent introduction to the microscopic study of minerals.

Edward H. Kraus

NEW MINERALS: DOUBTFUL SPECIES

CLASS: SULFIDES. DIVISION: R : S = 1 : 2.

"Corynite," "Kallilite," "Villamaninite"

E. Thomson: A mineralographic study of the pyrite group. *Univ. Toronto Studies, Geol. Ser., No.* **12**, 32–39, 1921.

Discussion: These alleged species are clearly shown by mineragraphic study to be mixtures, and should be removed from lists of minerals. E. T. W.

"Weibullite"

T. L. Walker and E. Thomson: An examination of lillianite and galenobismutite. *Univ. Toronto Studies, Geol. Ser., No.* **12,** 11–15, 1921.

Discussion: Material apparently identical with that described as "weibullite" is found by mineragraphic study to be a mixture of cosalite and guanajuatite, and the existence of this supposed species is at least doubtful. E. T. W.

CLASS: OXIDES. DIVISION: R:O=1:1 (?)

"Trevorite"

Andrew F. Crosse: A rich nickel ore. *J. Chem. Met. Mining Soc. S. Africa*, **21**, 126, 1921.

Name: After Major T. G. *Trevor*, Mining Inspector for the Pretoria District.

Description: An ore found near talc mines on the farm Bon Accord, north of the branch line to Barberton, near the Sheba siding shows on analysis NiO 40.30, FeO 49.30, SiO_2 6.50 and small amounts of other constituents. "This ore is, as far as I am able to judge, a new and undescribed mineral." Major Trevor describes it as a massive black rock composed of grains of magnetite with a slight green tinge.

Discussion: This might be a mixture of bunsenite and magnetite, but requires mineralogical investigation. E. T. W.

CLASS: CARBONATES AND OTHER CARBON COMPOUNDS. DIVISION: HUMUS SUBSTANCES.

"Ulmite"

T. Steel: Ulmite, a constituent of black sandstone. *Proc. Linnean Soc N. S. Wales*, **46**, 213–215, 1921; also in *Chem. News*, **123**, 293.

Name: Evidently from the chemical term *ulmin*, which is in turn derived from the Latin *ulmus*, the elm tree.

Chemical Properties: Formula, approximately $C_3H_4O_2$; theory C 50.0, H 5.6, O 44.4, sum 100.0%. Analysis gave, after deducting ash; C 50.53, H 5.67, O 43.20, N O.60, sum 100.00%.

Physical Properties: A black film on sand grains, soluble in alkali.

Discussion: No data are given to prove the homogeneity of this material, and it is questionable whether it should be considered a mineral at all.

E. T. W.

CLASS: PHOSPHATES, ETC. DIVISION: $RO:P_2O_5:H_2O=6:1:7$.

"Arakawaite"

Y. Wakabayashi and K. Komada. A phosphate of copper and zinc from the Arakawa mine. (In Japanese.) *J. Geol. Soc. Tokyo*, **28**, 191–211, 1921; through *Min. Abstr.* **1**, 250–251, 1922. (Abstract by R. O.)

Name: After the locality, the *Arakawa* mine, near Akita, Japan.

Chemical Properties: Formula, $6\,(Cu, Zn)\,O.P_2O_5\,.7H_2O$ or $(Cu, Zn)_6\,P_2O_{11}+7H_2O$. (Theory, for Cu alone, CuO 64.0, P_2O_5 19.1, H_2O 16.9%). The mean of 3 analyses gave: CuO 40.44, ZnO 23.64, P_2O_5 19.01, H_2O 16.22, sum 99.31%.

Crystallographic Properties: System monoclinic, with $a:b:c=0.7497:1:1.0245$; $\beta=70\tfrac{1}{2}°$. Forms (011), (110), $(\bar{1}11)$, $(\bar{1}21)$, $(\bar{3}11)$, $(\bar{5}26)$, $(\bar{5}24)$ and (100), the first two predominating.

OPTICAL PROPERTIES: Biaxial, +; $\alpha=1.618$, $\beta=1.622$, $\gamma=1.658$. Optic axial plane (010); Bx_a making 36° with axis *c* in acute angle β; $2V = 38\frac{1}{2}°$.

PHYSICAL PROPERTIES: Form, crystals up to 8×18 mm. Color, dark bluish green; luster, vitreous to resinous; translucent to opaque. $H.=3\frac{1}{2}$; sp.gr. =3.09.

OCCURRENCE. In the oxidized zone of a copper lode.

DISCUSSION. A similar mineral has been reported, without name, from Rhodesia: F. P. Mennell, *Min. Mag.*, **19**, 69–72, 1920. In both cases the materials differ from the most nearly related older species, veszelyite, in absence of arsenic, as well as in ratios. It may be noted also that veszelyite according to Larsen (*Micr. Detn. Non-op. Min.*) has somewhat higher refractive indices. Nevertheless the distinctness of the two can not be regarded as established. The ratios of neither are very definitely fixed, and the presence of a little isomorphous arsenic, making one mineral the arseniferous variety of the other, could raise the indices to the observed extent. For the present, "arakawaite" may be considered a sub-species of **veszelyite**. E. T. W.

CLASS: PHOSPHATES. DIVISION: $R'': R''': P : H_2O=1:2 : 2:1$.

"Calcium lazulite"

T. L. WATSON: Lazulite of Graves Mountain, Georgia, with notes on other occurrences in the U. S. *J. Wash. Acad. Sci.*, **11**, (16), 386–391, 1921; this mineral, p. 389.

NAME: From the composition, a *calcium*-rich *lazulite.*

CHEMICAL PROPERTIES: Formula, $4MgO.CaO.FeO.6Al_2O_3.6P_2O_5.6H_2O$, or $Mg_4CaFeAl_{12}(OH)_{12}(PO_4)_{12}$. Theory: MgO 8.6, CaO 3.0, FeO 3.9, Al_2O_3 32.9, P_2O_5 45.8, H_2O 5.8, sum 100.0%. Analysis by J. W. Watson gave (after deducting 6% SiO_2) MgO 9.64, CaO 3.30, FeO 4.24, Al_2O_3 36.02, P_2O_5 40.61, H_2O 6.19, sum 100.00%. The Al_2O_3 is abnormally high, the P_2O_5 low.

PHYSICAL PROPERTIES: Not essentially different from those of other lazulites; sp. gr. 2.958.

DISCUSSION: To be classed as a variety of lazulite, perhaps most simply designated as **calciferous lazulite**. E. T. W.

CLASS: PHOSPHATES. DIVISION: $Al:P:H_2O = 4:2:5$ (?)

"Bolivarite"

L. FERNÁNDEZ NAVARRO AND P. CASTRO BAREA: La "bolivarita," nueva especie mineral. [Bolivarite, a new mineral species.] *Bol. soc. españ. hist. nat.*, **21**, 326–328, 1921.

NAME: "Dedicated to the famous entomologist, D. Ignacio *Bolívar.*"

CHEMICAL PROPERTIES: Formula given as "$PO_4AlAl(OH)_3 + H_2O$". Spectroscopic examination showed the absence of other elements [altho fluorine is not noted as having been tested for]. An analysis is given, without mention of methods used and the results computed to 3 decimal places. [Since the usual methods of separating alumina and phosphoric acid are not capable of yielding results of significance beyond the unit place, only one additional figure for summation purposes is necessary.] The composition approximates: Al_2O_3 44.1, P_2O_5

34.9 and H_2O 20.6, sum 99.6%. [No data are given as to the temperature at which the water is evolved. It is evidently essentially identical with peganite].

Physical Properties: Color pale yellowish green, becoming white on exposure to the weather or upon heating. Luster vitreous. Structure, crusts with granular crystalline surface. Fracture splintery-conchoidal. H. = 2.5. Sp. gr. = 2.05. Under the microscope it shows a cryptocrystalline structure and weak birefringence. No optical constants could be determined.

Occurrence: A pneumatolytic alteration product of granite, found near the road from Pontevedra to Campo-Lameiro.

Discussion: Resembles turquois, but differs in the absence of copper. Should be classed as a **variety of peganite** until its distinctness is confirmed by further chemical and especially by optical study. E. T. W.

CLASS: SILICATES. DIVISION: R'': SiO_2:H_2O = 1:1:X.

"Katangite" = Cornuite, Rogers, 1917

H. Buttgenbach: Description of the minerals of Belgian Congo. *Mem. acad. royale Belg., Cl. Sci.*, [2], **6**, no. 8, 33 pages, 1921; this mineral, p. 26.

Name: From the locality, *Katanga*.

Chemical Properties: A copper silicate, with the general ratios of dioptase, but giving about 10% water at 100° and 10% more at red heat. This is assumed to indicate the formula $H_2CuSiO_4 + Aq$. [Experience on colloid minerals has shown, however, that it is not sufficient to determine the water lost below and above 100°, and the only formula which can be regarded as at all established is $CuSiO_3 + X\ H_2O$. Abstr.]

Physical Properties: Amorphous. Color bluish; adheres to the tongue; sectile; sp. gr. 2.4.

Discussion: Evidently the same as amorphous chrysocolla, named **cornuite** by Rogers (Rev. amorph. min.; abstr. in *Am. Min.*, **3**, 157–158, 1918.).

E. T. W.

ABSTRACTS—CRYSTALLOGRAPHY

ESSENTIALS OF THE MINUTE STRUCTURE OF CRYSTALS. F. Rinne. *Physik. Z.*, **21**, 609–13, 1920.

Leptonology (λεπτός = fine, delicate) is the name proposed to designate stereochemistry, stereophysics and crystal structure as a group. The units dealt with (atoms, ions, molecules and even electrons) are called leptons. Geometrical crystallography may be regarded as macro-stereochemistry, crystals being sections of the leptonic structure whose faces and edges are planes and lines of high atomic concentration. In a leptonic sense amorphous matter is no less regular than crystalline, the latter representing three dimensional periodicity of space lattices, while the former may be compared with an excessively fine crystal powder. Leptonic structures may contain groups or clusters. These should be searched for and a means found to designate them, just as the chemist designates radicles in his chemical formulae. Mixed crystals are transitions between chemical compounds and physical mixtures and this conception may be extended to regular inter-