

in establishing either the distinctness of the two, or the composition of the present one, and it is therefore classed as doubtful. E. T. W.

**"Wodanite"**

G. LATTERMANN: Investigations of the minerals of the Katzenbuckel, quoted by H. ROSENBUSCH, *Elemente der Gesteinslehre*, Ed. 3, p. 201, 1910; W. FREUDENBERG: Titanium-biotite (wodanite) from the Katzenbuckel. *Mitt. Bad. Geol. Landesanst.*, 8, (2), 319-335, 1920.

NAME: Origin unknown, as Lattermann's original manuscript was lost; presumably after the mythological character, *Wodan*.

CHEMICAL PROPERTIES: Four analyses are given, but they show wide variation; the following (by O. H. Heidenreich of Kristiania) is considered the most reliable  $\text{SiO}_2$  38.69,  $\text{TiO}_2$  12.56,  $\text{Al}_2\text{O}_3$  9.45,  $\text{Fe}_2\text{O}_3$  3.09,  $\text{FeO}$  10.63,  $\text{MnO}$  0.09,  $\text{MgO}$  13.80,  $\text{CaO}$  (+traces of SrO and BaO) 0.83,  $\text{K}_2\text{O}$  7.96,  $\text{Na}_2\text{O}$  1.69, F 0.71,  $\text{H}_2\text{O}$  0.76, sum 100.26%. It is concluded that the Ti is present largely as  $\text{TiO}_2$  replacing  $\text{SiO}_2$ . From this a highly complex formula is derived.

PHYSICAL PROPERTIES: Exhibits the features of biotite of the meroxene variety.

OCCURRENCE: Found in the shonkinite rock of the Katzenbuckel, a famous German locality. C. S. Ross.

DISCUSSION: The simple composition, corresponding as closely to the analysis as could be expected in view of the evident variability of the material, is:  $\text{K}_2\text{O} : 4(\text{Mg}, \text{Fe})\text{O} : \text{MgF}(\text{OH}) : (\text{Al}, \text{Fe})_2\text{O}_3 : \text{Ti}_2\text{O}_3 : 6\text{SiO}_2$ , an "orthosilicate" ratio; placing the Ti along with the Si makes the ratio too basic. It should be called tentatively *titaniferous biotite*. E. T. W.

FAMILY: COLUMBATES, ETC. DIVISION:  $\text{XR}'' : \text{YR}'' : \text{ZCb}$ , WITH  $X > Z > Y$ .

**Unnamed**

YUJI SHIBATA and KENJIRO KIMURA: Chemical investigation of Japanese minerals containing rare elements. IV. Samarskite and an unnamed mineral from Ishikawa, Iwaki Province. *J. Chem. Soc. Japan*, 43, 301-312, 1922; thru *Chem. Abstr.*, 16, 2750, 1922.

CHEMICAL PROPERTIES: A preliminary analysis gave:  $\text{MgO}$  1.07,  $\text{CaO}$  0.86,  $\text{MnO}$  0.40,  $\text{FeO}$  11.78,  $\text{Al}_2\text{O}_3$  0.87, rare earths 8.40,  $\text{UO}_2$  21.88,  $\text{SnO}_2$  1.20,  $\text{SiO}_2$  0.30,  $\text{TiO}_2$  0.21,  $\text{Cb}_2\text{O}_5$  36.80,  $\text{Ta}_2\text{O}_5$  15.00,  $\text{H}_2\text{O}$  0.89, sum 99.66%. This seems to correspond to  $10 \text{R}''\text{O} \cdot \text{R}'' \frac{1}{2}\text{O}_3 \cdot 6 (\text{Cb}, \text{Ta})_2\text{O}_6$ , where  $\text{R}''$  includes  $(\text{UO}_2)$ .

PHYSICAL PROPERTIES: Color black; luster brilliant; opaque;  $\text{H} = 5-6$ ; sp. gr. = 6.2-6.4.

DISCUSSION: Thought to be different in properties from the minerals of the samarskite group, but assignment of a name is withheld until a final analysis is made. Up to the present time at least two names, "nohlite" and "ännerocedite," have been given to material not essentially different in composition from that noted above. E. T. W.

**ABSTRACTS—CRYSTALLOGRAPHY**

THE STRUCTURE AND SYMMETRY OF ANATASE, RUTILE, ZIRCON, AND XENOTIME. A. JOHNSEN. *Centr. Min. Geol.*, 1919, 97-105.

According to Johnsen, anatase, rutile, and xenotime are ditetragonal bipyramidal, while zircon is either ditetragonal or tetragonal pyramidal.

EDW. F. HOLDEN.

CRYSTALLOGRAPHIC PROPERTIES OF THE COMPOUND  $C_{11}H_9O_2N$ 

A. JOHNSEN. *Centr. Min. Geol.*, 1919, 33-34.

This compound is monoclinic, holohedral,  $a:b:c=1.335\pm.003:1:0.57\pm.06$ ,  $\beta=114^\circ 18\frac{1}{2}'\pm 6'$ ; cleavage good (100), fair (101); sp. gr. =  $1.345\pm.002$ , at  $16^\circ$ ; Z parallel to (010), Y to (001), X perpendicular to (100), X is acute bisectrix, 2E large,  $\rho > \nu$   $\beta_{na}=1.756\pm.001$ , pleochroic.

E. F. H.

## THE INTIMATE STRUCTURE OF ISOMORPHOUS SUBSTANCES. F.

RINNE. *Centr. Min. Geol.*, 1919, 161-172.

R. concludes that isomorphous substances have a structure intermediate between chemical compounds and physical mixtures.

E. F. H.

## THE CHANGE IN THE INTERFERENCE COLORS OF CRYSTALS, IN PLANE POLARIZED LIGHT, CAUSED BY TURNING THE NICOLS.

ALFRED WENZEL. *Centr. Min. Geol.*, 1919, 232-247.

Quartz and tourmaline especially are discussed, and formulas are derived.

E. F. H.

LAUE DIAGRAMS OF BENITOITE. F. RINNE. *Centr. Min. Geol.*, 1919, 193-201.

Benitoite is shown to be ditrigonal bipyramidal.

E. F. H.

THE CRYSTALLOGRAPHY OF VOGTITE, AN ANORTHIC METASILICATE OF IRON, CALCIUM, MANGANESE, AND MAGNESIUM, FROM ACID STEEL-FURNACE SLAGS. A. F. HALLMOND. *Min. Mag.*, 18, 368-373, 1919.

The slags were for the most part melts consisting principally of the three oxides FeO, MnO, and SiO<sub>2</sub>, and yielded fayalite and rhodonite. The small amount of calcium silicate usually present is held in isomorphous solid solution, but when the amount of lime exceeds 8% a new silicate appears, which does not seem to belong to any of the known mineral groups. A summary of its properties are:

NAME: Vogtite, in honor of J. H. L. Vogt. (This name was first proposed by C. Hlawatsch in 1907 to describe a substance either identical or at least isomorphous with the present material.)

CRYSTALLOGRAPHIC PROPERTIES: Elongated crystals, triclinic system.  $a:b:c=1.093:1:0.729$ .  $\alpha=99^\circ 37'$ ,  $\beta=99^\circ 21'$ ,  $\gamma=83^\circ 53'$ . Forms: (010), (110), ( $\bar{1}\bar{1}0$ ), (0 $\bar{1}$ 1), (101), ( $3\bar{1}0$ ).

OPTICAL PROPERTIES: Color, transparent and pale amber. Little or no pleochroism and nearly straight extinction. Axial plane is nearly  $\perp$  to zone of elongation. Sign -.  $\beta=1.701$ .  $\gamma-\alpha=0.018$ .  $2V=65\frac{1}{2}^\circ$ . Prismatic cleavage.

CHEMICAL PROPERTIES: Composition approximates the metasilicate ratio; the deviation is greater than would be expected for the material analyzed, but is explained by solid solution of non-isomorphous compounds.

W. F. H.

OBSERVATION OF INTERFERENCE FIGURES ON CRYSTAL PLATES IN CONVERGENT POLARIZED LIGHT WITH AN  $\alpha$ -MONOBROMNAPHTHALENE CONDENSER. ARTHUR EHRLINGHAUS. *Neues Jahrb. Min. Geol.*, 1919, I, 1-4.

A condenser with a numerical aperture of 1.55, to be used in conjunction with a microscopic objective of numerical aperture 1.52, is described. The upper lens of the three lens condenser has a refractive index of 1.66 which is the same as that of the immersing liquid,  $\alpha$ -monobromnaphthalene. This lens system is par-

ticularly valuable for observation of interference figures. The condition that both optic axes appear in the field in sections cut perpendicular to a bisectrix is given by:  $b \cdot \sin. a < A$ , where  $b$  = mean refractive index of crystal,  $a = \frac{1}{2}$  optic axial angle,  $A$  = numerical aperture. A plate accompanying the paper shows among other things a section of anhydrite cut perpendicular to the obtuse bisectrix, both axes appearing in the field; the optic axial angle represented is  $136^\circ 19'$ .

O. VON SCHLICHTEN.

THE LAUE PHOTODIAGRAM OF ICE. R. GROSS. *Centr. Min. Geol.*, 1919, 201-207.

Laue diagrams of ice place it in the dihexagonal bipyramidal class. E. F. H.

SEMSEYITE FROM DUMFRIESHIRE. G. F. HERBERT SMITH; CHEMICAL ANALYSIS, G. T. PRIOR. *Min. Mag.*, 18, 354-360, 1919.

The crystals examined were small and associated with stibnite, valentinite, ankerite, calcite, sphalerite and pyrite. Measurements were obtained by means of a 3-circle goniometer, and the values on two crystals are recorded.  $a:b:c = 1.1356:1:1.0218$ .  $\beta = 105^\circ 46'$ . These data do not agree very closely with those previously published, which were obtained on crystals from Felsöbanya. The forms observed are: (100), (001), (201), ( $\bar{2}$ 01), (310), (021), (041), (223), (111), (221), (112), ( $\bar{1}$ 11), ( $\bar{1}$ 12), (449), (331). The faces (18.18.19) and ( $\bar{5}$ 56) are probably vicinal, and do not represent distinct forms. The material for the analysis was obtained from the drusy lining of one of the small cavities. The analysis checks closely with that required by the formula,  $9 \text{PbS} \cdot 4 \text{Sb}_2\text{S}_3$ . W. F. H.

FELDSPAR CRYSTALS DEVELOPED IN THE UPPER CRETACEOUS PYRENEAN LIMESTONES. J. DE LAPPARENT, *Compt. Rend.*, 167, 784-6, 1918; thru *Min. Abst.* 1, 276.

Small albite crystals are associated with foraminifera and algal remains. The author believes the algae have been responsible for the formation of albite.

E. F. H.

LAUE DIAGRAMS OF NEPHELITE. F. RINNE. *Centr. Min. Geol.*, 1919, 129-133.

The Laue diagrams of nephelite agree with the etch figures in placing it in the hexagonal pyramidal class.

E. F. H.

## MINERALOGY

OUTLINES OF A SYSTEMATIC ARRANGEMENT OF "FIGURATIVE" ROCK OBJECTS. A. ISSEL. *Mem. Accad. Lincei*, [5], 11 (11), 41 pp., 1916; thru *Rev. géol.*, 1 (11), 426-427, 1920.

The objects discussed include concretions, geodes, stalactites, etc. E. T. W.

BIOLITES AND PISOLITES. A. ISSEL. *Noll. Comit. Geol.*, [5], 6 (4), 47 pp., 1916-1918; thru *Rev. géol.*, 1 (11), 427-428, 1920.

Comprises descriptions of various nodules and concretions. E. T. W.

ANDESINE FROM HOHENSTEIN IN THE KREMSTAL (LOWER AUSTRIA). O. GROSSPIETSCH. *Sitz. Akad. Wiss. Wien, Math.-naturw. Kl. Abt. 1*, 127, 439-47, 1918; thru *Min. Absts.*, 1, 281.

An analysis of an andesine found in a pegmatite gave  $Ab_{65}An_{35}$ . Sp. gr. 2.67. Extinction on (001) about  $0^\circ$ , on (010)  $-2^\circ$  to  $-5^\circ$ .  $2V$   $93.2^\circ$ ,  $a$  1.5447,  $\beta$  1.5489,  $\gamma$  1.5528 (Na).

E. F. H.

THE PRODUCTION OF SILICA AND SILICEOUS LIMESTONES BY ALGAE OF THE GIRVANELLA GROUP. J. DE LAPPARENT. *Compt. Rend.*, 167, 999-1001, 1918; thru *Min. Absts.*, 1, 276.

The transformation of foraminifera tests to chalcedony, and the production of fine chalcedony in certain limestones, is attributed to the action of algae.

E. F. H.

A STUDY OF CERTAIN MINERALS FROM COBALT, ONTARIO. H. V. ELLSWORTH. *Ont. Bur. Mines*, 25, 1, 200-43, 1916.

The following minerals were analyzed, examined in polished section and in some cases crystal measurements were made: argentite, galena, chalcocite, breithauptite, niccolite, cobaltite, smaltite, chloanthite, arsenopyrite, glaucodot, matildite, proustite, polybasite, scorodite, erythrite, and (new for Cobalt) löllingite, rammelsbergite, chalcocite, and symplectite. Intergrowths of minerals are the rule here rather than true isomorphous mixtures. The paragenesis of the deposit is given.

E. F. H.

TWINNING OF QUARTZ FROM BRAZIL AFTER  $\xi$ . R. BRAUNS. *Neues Jahrb. Min. Geol.*, 1919, 1, 29-49.

Three quartz crystals from Serra dos Cristaes in Goyaz, Brazil, twinned after  $\xi$  (1121) are described minutely, followed by a discussion and summary of previous observations on twinning according to this law.

O. VON SCHLICHTEN.

NEPHELIN-BEARING PEGMATITIC DYKES IN SEILAND. ADOLF HOEL AND J. SCHEDELIG. *Festkrift, Amund Helland, Kristiana*, 1916, 110-31; thru *Min. Absts.*, 1, 282.

In Seiland, Finmarken, Norway there are three types of pegmatites, characterized respectively by calcite, nephelite, and corundum. The calcite type contains primary calcite, zircon, tourmaline, apatite, muscovite, biotite and albite; the albite is in large xls. with forms  $b c m M f z p o y n x u$ .

E. F. H.

CHEMICAL RELATIONS OF KAOLINITE AT HIGH TEMPERATURES. J. MATĚJKÁ. *Chem. Listy, Prague*, 13, 164-6, 182-5, 1919; thru *Min. Absts.*, 1, 287.

The solubility of kaolinite in boiling NaOH at temps. from 110° to 1100° is recorded. The water goes off at 500-600°, and various Al silicates are successively formed until at 1100° there remains only a mixture of sillimanite and cristobalite.

E. F. H.

MONOGRAPH OF THE QUARTZ FROM BOHEMIAN COUNTRIES. I. A. ONDŘEJ. *Prague*, 1919, 66 pp.; thru *Min. Absts.*, 1, 289.

Quartz crystals from six localities are described. Eight new forms are noted: from Hořepník, (13.0.13.6), (7073), (15.2.13.7), (16.3.13.4), (4.19.15.4), from Pisek (9.1.10.6), from Marešov (7161), (9.1.10.6).

E. F. H.

CALCITE FROM LIBUŠÍN. AUG. ONDŘEJ. *Rozpravy České Akad.*, class 2, 27, no. 14, 5 pp., 1918; thru *Min. Absts.* 1, 289.

Beautiful calcite crystals occur in veins traversing Algonkian spilites in the Janský coal mine. Two new vicinal forms are  $o$  (6.27.33.10) and  $p$  (31.93.124.32).

E. F. H.

THE CRYSTAL FORM-SERIES OF TOPAZ. V. ROSICKÝ. *Rozpravy České Akad.*, class 2, 25, No. 22, 65 pp., 1916; thru *Min. Absts.*, 1, 292.

A tabulation of axial ratios and crystal forms, with a bibliography. In only a few cases can axial ratios be correlated with composition.

E. F. H.

SUPPLEMENTS TO THE NOTES ON MORAVIAN MINERAL OCCURRENCES. B. KUČERA. *Sborník Klubu Přírodovědeckého, Brno* 2, 22-3, 1918; 3, 71-3, 1920; thru *Min. Absts.*, 1, 292.

Minerals new for Bohemia are: bismuth, valentinite, brookite, caledonite, olivenite, phillipsite. Many new localities for other minerals are recorded.

E. F. H.

CONTRIBUTION TO THE STUDY OF HYDROZINCITE. C. PERRIER. *Atti. Soc. Ital. Sci. Nat.*, 54, 188-222, 1916; thru *Min. Absts.*, 1, 294.

Specimens from six European localities were analyzed and examined optically. Thin sections showed needles and spherulites in an isotropic base. The purest material (Buggerru), wholly crystalline, gave the formula,  $2ZnCO_3 \cdot 3Zn(OH)_2$ , and dehydration expts. on artificial and natural material point to this as the formula.

E. F. H.

GRAPHIC DETERMINATION OF BOTH OPTIC AXES OF TRICLINIC CRYSTALS FROM THE EXTINCTION DIRECTION ON FIVE FACES.

A. JOHNSEN. *Centr. Min. Geol.*, 1919, 321-326.

A means of determining the optic axes using the stereographic projection.

W. F. FOSHAG.

CONTRIBUTION TO THE KNOWLEDGE OF THE URANIUM-MICAS.

B. STOČES. *Rozpravy České Akad.*, 27, No. 27, 4 pp., 1918; thru *Min. Absts.* 1, 291.

A new locality for torbernite is at Německá Lhota near Píbram, Bohemia. The following values were given: autunite, Joachimsthal  $n$  (mean) 1.596,  $2E$   $45^\circ$ ; torbernite, Joachimsthal 1.628 and  $20^\circ$ , Schönficht, 1.610 and  $25^\circ$ , Schlaggenwald, 1.622 and  $25-30^\circ$ , Německá Lhota, 1.621 and small; zeunerite, Joachimsthal, 1.612 and  $20^\circ$ .

E. F. H.

BARITE AND EPIDOTE FROM PÍSEK. B. JEŽEK AND A. KREJČÍ. *Rozpravy České Akad.*, class 2, 28, No. 17, 4 pp., 1919; thru *Min. Absts.*, 1, 292.

Small colorless barite crystals showed the forms  $c a b m N d u o \lambda \chi$  and (new) (4.4.15) and (1.2.24). Epidote crystals showed  $b z n$  and (new) (11.0.4).

E. F. H.

THE MINERALS FROM THE VELKÁ SKÁLA, NEAR PISEK. B. JEŽEK AND A. KREJČÍ. *Rozpravy České Akad.*, class 2, 28, No. 19, 4 pp., 1919; thru *Min. Absts.*, 1, 292.

The pegmatite of the Velka skala (Great Rock) contains crystals of beryl, albite, apatite, and pseudomorphs of gigantolite after cordierite.

E. F. H.

A SINGLY REFRACTING POTASSIUM ALUMINUM SULFATE OF THE ALUNITE GROUP. E. RAMANN AND A. SPENGLER. *Centr. Min. Geol.*, 1919, 35-38.

This mineral, formed by solfataric processes at Solfataro di Puzzoli near Naples, was finely granular and isotropic and gave  $Al_2O_3$  36.66,  $K_2O$  11.91,  $SO_3$  38.35,  $H_2O$  (diff.) 13.08%, or  $K_2O \cdot 3Al_2O_3 \cdot 4SO_4 \cdot 6H_2O$ .

E. F. H.

APHTHITALITE IN A FUMAROLE OF ETNA. G. PONTE. *Rend. accad. Lincei*, 28, 362-365, 1919; thru *Rev. géol.* 1(3) 88, 1920.

Soft green hexagonal plates of apthitalite were found around a fumarole in the ava of 1918. On keeping, they have become blue and crumbly. The composition

is  $\text{Na}_2\text{SO}_4$  58.9,  $\text{K}_2\text{SO}_4$  38.3, and  $\text{CuSO}_4$  2.8%. The mineral is thought to have been formed by the action of  $\text{H}_2\text{SO}_4$  on alkali chlorides. E. T. W.

HORIZONTALLY BANDED AGATES. RAFAEL ED. LIESEGANG. *Centr. Min. Geol.*, 1919, 184-188.

A discussion of the physical and chemical conditions under which horizontally banded agates may be produced. E. F. H.

MINERALOGICAL STUDIES ON MATERIAL FROM SJÖGREN'S MINERAL COLLECTION. G. AMINOFF. *Arkiv. Kemi. Min. Geol.*, 7, No. 17, 1-58, 1919; *thru Min. Abstr.* 1, 4, 1920.

(a) Natural etch figures on sulfur crystals conform with the symmetry of the holohedral class. (b) Two new forms, (115) and (11.5.2), were found on a stibnite crystal from Japan. (c) Twinned quartz crystals from Sanarka, Urals, show a tabular development parallel to two prism faces and 5 new forms, (0.11.11.2), (4.13.9.4), (7.29.22.9), (2.11.9.2), and (1761). (d) Two heartshaped twins of calcite from Egremont, Cumberland are described. (e) The axial ratio of crystals of chessylite from Copper Queen mine, Arizona, gave  $a:b:c=0.8561:1:0.8842$ ;  $\beta=87^\circ 35'$ . Material from Broken Hill, N.S.W. gave  $\beta=86^\circ 41'$ . (f) Manganaxinite from Franklin Furnace, N. J. showed one new (454) of the 25 forms present.  $a:b:c=0.7797:1:0.9764$ ;  $\alpha=91^\circ 55'$ ,  $\beta=81^\circ 51'$ ,  $\gamma=102^\circ 53'$ . W. F. H.

THE HATCHETTITE OF THE COALS OF HAINAUT. X. STAINIER. *Bull. soc. belge géol.*, 28, 123-128 (1914) 1919; *thru Rev. géol.*, 1 (1), 18, 1920.

The occurrence of the hydrocarbon mineral hatchettite in association with siderite is described. E. T. W.

CONTRIBUTIONS TO THE STUDY OF BELGIAN MINERALS. H. BUTTGENBACH. *Ann. soc. géol. Belgique*, 42, M 93-124, 1919; *thru Rev. géol.*, 1 (3), 74, 1920.

Several Belgian minerals are described crystallographically, including: calamine from Moresnet with the form  $f$ ; gypsum from Corphalie with the form  $\varphi$ ; aragonite from Lavoir with the forms  $b$  and  $e$ ; calcite from Denée; anglesite and barite not previously noted. Apophyllite, new to Belgium, has been found at Quenast, and zonal groupings of hopeite at Moresnet. A complex clay was analyzed; efflorescences in Liege coal mines found to be trona; and fuchsite indentified optically at Salm-Château. E. T. W.

THE CALAMINE OF THE FOSSIL BONES AT BROKEN HILL, RHODESIA. H. BUTTGENBACH. *Ann. soc. géol. Belg., Publ. rel. Congo Belge*, 42, annexe, C5-14, (1916) 1919; *thru Rev. géol.*, 1 (9), 329, 1920.

The bones are partly transformed into a crust of crystalline calamine, and also into a spongy aggregate of minute crystals of willemite, smithsonite, hopeite, etc. E. T. W.

CONTRIBUTIONS TO THE KNOWLEDGE OF THE TOURMALINE GROUP. K. SCHLOSSMACHER. *Centr. Min. Geol.*, 1919, 106-121.

Brown and green tourmaline from St. Gothard, and colorless to pale yellow tourmaline from St. Piero Elba were thoroly investigated as to crystallography, indices of refraction, and specific gravity. E. F. H.