

Dr. Kunz then spoke of the various city localities and the minerals found therein. He stated that the East Side, from 37 to 110 St., probably afforded the most specimens. The various tunnels and their minerals were spoken of.

Capt. Miller called attention to the fine collection of Brooklyn Drift Minerals and Rocks in the collection of the Long Island Historical Society. He also mentioned the occurrence of monazite and xenotime crystals, on the Speedway, Harlem River. Dr. Kunz emphasized the importance of complete records being kept of all finds. THOMAS I. MILLER, *Secretary Pro. Tem.*

## NEW MINERALS

It is proposed hereafter to indicate in a general way the classification of all new minerals recorded in this department. Subdivision will be first into "families," of which nine may be recognized, as listed in the January number (*Am. Min.* 6 (1), 12, 1921). Each family will be separated into "subfamilies" based on special features of composition. This arrangement is tentative and open to modification, and criticism of it will be welcome. [Ed.]

### FAMILY 2. SULFIDES, ETC.

#### SUBFAMILY 3. DOUBLE SULFIDES OF METALS AND SEMI-METALS.

#### ULTRABASITE

V. ROSICKÝ and J. STERBA-BÖHM. Ultrabasit, ein neues Mineral aus Freiberg in Sachsen. (Ultrabasite, a new mineral from Freiberg, Saxony). *Rozpr. české Akad. Prag*, 25, No. 45, 1916; *Z. Kryst. Min.*, 55, 430-439, 1920.

NAME: From its extremely basic chemical composition.

#### PHYSICAL PROPERTIES

Color black, somewhat grayish; luster metallic; streak black; cleavage none; fracture scaly, with somewhat greasy luster on the surface. H. = 5; sp. gr. 6.026.

#### CRYSTALLOGRAPHIC PROPERTIES

Orthorhombic peri-tetragonal.  $a : b : c = 0.988 : 1 : 1.462$ . Habit thick-columnar, with vertical striations in the prism zone. Forms:  $a(100)$ ,  $b(010)$ ,  $r(210)$ ,  $m(110)$ ,  $g(230)$ ,  $n(130)$ ,  $i(015)?$ ,  $h(012)$ ,  $f(011)$ ,  $r(102)$ ,  $d(101)$ ,  $e(114)$ ,  $s(214)$ ,  $? (218)$  and  $? (126)$ . Dominant,  $m$ ,  $n$ ,  $d$ , and  $f$ . Most forms are incompletely developed; and there is some suggestion of twinning.

#### CHEMICAL PROPERTIES.

Decrepitates on heating, and at rather low temperature gives off white fumes. If finely powdered, slowly decomposed by HCl and HNO<sub>3</sub>, with the separation of some sulfur. Easily decomposed on fusion with alkali carbonates and nitrate. Gives tests for Pb, Ag, and Sb, with traces of Fe and Cu, but no As nor Sn. Some disturbing element was found to be present, which proved to be germanium, as shown by the formation of coatings of GeS, purple, near the mineral, and GeS<sub>2</sub>, white, distant, on heating in a stream of H<sub>2</sub>S. The Marsh test, as usually applied to As, gives a coating of Ge. Care must be taken, in analyzing, not to heat the mineral in contact with HCl, or the Ge will volatilize as GeCl<sub>4</sub>.

For quantitative analysis the mineral was treated with dil.  $\text{HNO}_3$ , evapd. to dryness, and taken up with  $\text{H}_2\text{O}$ , whereupon the Sb and Ge oxides remained insoluble. The solid was treated with 15%  $\text{KOH}$ , whereupon the Sb and Ge dissolved, leaving Pb and Ag insoluble. The Sb and Ge were turned into Na-sulfosalts, treated with dil.  $\text{H}_2\text{SO}_4$ , and the  $\text{Sb}_2\text{S}_3$  filtered off on a gooch crucible in a stream of  $\text{CO}_2$ . The filtrate was strongly acidified, and  $\text{H}_2\text{S}$  led in, the precipitated  $\text{GeS}_2$  being treated as was Sb. The sepn. is only approximate, but the best that could be done under the circumstances. The other elements were determined in the usual ways.

The composition proved to be: Ag 22.35, Pb 54.16, Cu 0.47, Fe 0.25, Sb 4.60, Ge 2.20, S 16.15, sum 100.18%. This is regarded as corresponding to  $11\text{Ag}_2\text{S} \cdot 28\text{PbS} \cdot 2\text{Sb}_2\text{S}_3 \cdot 3\text{GeS}_2$ , with 1.6 excess sulfur; or  $\text{Ag}_{22}\text{Pb}_{28}\text{Sb}_4\text{Ge}_3\text{S}_{53}$ . The mineral thus belongs toward the basic end of the sulfogermanates.

#### OCCURRENCE

Observed on two specimens collected by an English mineralogist, Walker, in 1829 and 1833, at the Himmelfurst mine, Freiberg. They show granite with a crust of quartz and rhodochrosite, on these galenite crystals, and still later the ultrabasite crystals, 8 x 5 mm. in size. Over the two last are tiny proustite crystals, and the whole is covered by a second generation of quartz.

#### DISCUSSION

[A somewhat simpler formula would be  $6\text{Ag}_2\text{S} \cdot 16\text{PbS} \cdot 2\text{GeS}_2 \cdot \text{Sb}_2\text{S}_3 \cdot \text{S}$ , or  $2 \times \text{Ag}_6\text{Pb}_8\text{GeSbS}_{15}$ . Theory: Ag 21.8, Pb 55.6, Ge 2.4, Sb 4.0, S 16.2, sum 100.0%. The ratio of basic sulfides to acidic ones is about 7 : 1, which brings the mineral between the divisions containing beegerite (6 : 1) and polybasite (8 : 1) in a classification based on this ratio.] E. T. W.

### FAMILY 7. PHOSPHATES, ARSENATES, ETC.

#### SUBFAMILY 1. ARSENITES AND RELATED COMPOUNDS.

#### ARMANGITE

G. AMINOFF and R. MAUZELIUS: Armangite, a new arsenite from Langbanshyttan. *Geol. Fören. Förh.* **42** (5), 301-309, 1920.

NAME: From its chief chemical components, arsenic and manganese.

#### PHYSICAL PROPERTIES

Color black, in microscopic sections brown to yellow. Streak brown. Form minute crystals.  $H = 4$ . Sp. gr. 4.23.

#### CRYSTALLOGRAPHIC PROPERTIES

Hexagonal, rhombohedral.  $c = 1.3116$ ,  $p_0 = 0.8744$ . Habit prismatic. Forms:  $c(0001)$ ,  $b(11\bar{2}0)$ ,  $p(11\bar{2}1)$ ,  $f(11\bar{2}2)$ . Cleavage poor parallel to  $c$ .

#### OPTICAL PROPERTIES

Uniaxial, — Refractive indices higher than solutions of S in methylene iodide (1.79) but lower than S(1.93). Birefringence weak. No pleochroism.

#### CHEMICAL PROPERTIES

Essentially manganese ortho-arsenite,  $\text{Mn}_3(\text{AsO}_3)_2$ . (Theory MnO 51.8,  $\text{As}_2\text{O}_3$  48.2%). The mean of several analyses by Mauzelius on 0.5-0.8 gr. of

material gave:  $\text{As}_2\text{O}_3$  42.92,  $\text{Sb}_2\text{O}_3$  0.40,  $\text{PbO}$  0.32,  $\text{FeO}$  2.19,  $\text{MnO}$  45.06,  $\text{CaO}$  2.83,  $\text{MgO}$  0.49,  $\text{H}_2\text{O}$  0.71,  $\text{CO}_2$  5.08, insoluble 0.20, sum 100.20 per cent. The  $\text{CO}_2$ ,  $\text{CaO}$ ,  $\text{MgO}$  and some  $\text{FeO}$  are present as admixed carbonates.

OCCURRENCE

Occurs at Langbanshyttan, Sweden, where found by G. Flink in 1919, associated with calcite, barite, fluorite, hematite, and two minerals resembling pyroaurite (?) and ecdemite (?). S. G. G.

DISCUSSION

[May be accepted as a new species, but the composition must be regarded as inadequately established. To be placed in a group of phosphate-arsenate minerals abnormally low in  $\text{P}_2\text{O}_5$  or  $\text{As}_2\text{O}_5$ , or possibly containing  $\text{As}_2\text{O}_3$ .

W. F. F.]

FAMILY 7. PHOSPHATES, ARSENATES, ETC.

SUBFAMILY 8. SULFO-PHOSPHATES.

PHOSPHOPHYLLITE

H. LAUBMANN and H. STEINMETZ: Phosphatführende Pegmatite des Oberpfälzer und Bayerischen Waldes. (Phosphate-bearing pegmatites of the Upper Palatinate and Bavarian Forest Region). *Z. Kryst. Min.*, 55, 523-586, 1920; this mineral, 565-568.

NAME: From the composition, a *phosphate*, and the marked cleavage into sheets (*phylla*).

PHYSICAL PROPERTIES

Colorless to pale bluish green; luster vitreous; transparent; cleavage c, perfect, also good on a and b. H. = 3-4; sp. gr. 3.081.

CRYSTALLOGRAPHIC PROPERTIES

Monoclinic holohedral.  $a : b : c = 1.0381 : 1 : 1.7437$ ;  $\beta = 89^\circ 32'$ . Forms:  $a(100)$ ,  $c(001)$ ,  $q(011)$ ,  $k(012)$ ,  $g(021)$ ,  $s(102)$ ,  $\rho(\bar{1}01)$ ,  $\tau(\bar{1}03)$ ,  $\lambda(\bar{1}25)$ ,  $o(123)$ ,  $\omega(\bar{1}23)$  and  $\pi(\bar{1}21)$ . One type shows plates parallel to  $a$ , the other is more or less prismatic. The former is often, the latter always, twinned on  $c$ .

OPTICAL PROPERTIES

Mean  $n = 1.65$ ; birefringence 0.025. Axial plane b; cleavage flakes have the bisectrix outside the field of view.  $2E = 75^\circ$ ; sign —.

CHEMICAL PROPERTIES

Analysis by Dr. Spengel, after deducting 3.66% insoluble matter:  $\text{FeO}$  14.35,  $\text{CaO}$  5.42,  $\text{BaO}$  0.96,  $\text{MgO}$  12.75,  $\text{K}_2\text{O}$  9.00,  $\text{Al}_2\text{O}_3$  6.48,  $\text{P}_2\text{O}_5$  27.38,  $\text{SO}_3$  9.71,  $\text{H}_2\text{O}$  13.95, sum 100%. Some specimens contain Mn also. Suggested to correspond to  $3\text{R}_3\text{P}_2\text{O}_3 + 2\text{Al}(\text{OH})\text{SO}_4 + 9\text{H}_2\text{O}$ . [Since apparently formed under oxidizing conditions, much of the iron is probably ferric. Abstr.]

OCCURRENCE

A late development in cavities in corroded triplite at the pegmatite quarry at Habendorf. In this locality beside the usual pegmatite minerals (also

natrolite and sphalerite), triplite is very abundant; it contains 28.66% MnO and shows rough crystals agreeing approximately in angles with wagnerite. Triphylite is also present, showing 11.40 MnO. Both heterosite and purpurite occur as alteration products. Triploidite could be identified by its optical properties. Apatite is abundant, and analysis of one variety showed 4.93% MnO, making it a "manganapatite." Columbite in association with autunite is frequent. Secondary phosphates include vivianite (described crystallographically), dufrenite (called "kraurite"), cacoxenite associated with "xanthoxene" (described below), some fairfieldite (identified optically), phosphosiderite, and strengite. The new minerals phosphophyllite (above) and "phosphoferrite" (below) are associated with the last seven.

#### DISCUSSION

[May be accepted as a new species, altho the composition needs further study. It is evidently related to the beudantite group, especially to harttite,  $\text{SrO} \cdot 2\text{Al}_2\text{O}_3 \cdot \text{P}_2\text{O}_5 \cdot \text{SO}_3 \cdot 5\text{H}_2\text{O}$ . This relationship may be brought out by writing the formula of phosphophyllite:  $\text{K}_2\text{O} \cdot 8(\text{Mg}, \text{Fe})\text{O} \cdot 3(\text{Al}, \text{Fe})_2\text{O}_3 \cdot 3\text{P}_2\text{O}_5 \cdot 2\text{SO}_3 \cdot 12\text{H}_2\text{O}$ , which requires about :  $\text{K}_2\text{O}$  6,  $\text{RO}$  28,  $\text{R}_2\text{O}_3$  20,  $\text{P}_2\text{O}_5$  28,  $\text{SO}_3$  11 and  $\text{H}_2\text{O}$  14%.]

E. T. W.

#### FAMILY 7. PHOSPHATES, ARSENATES, ETC. DOUBTFUL SPECIES.

##### Kreuzbergite

LAUBMANN and STEINMETZ, *op. cit.*, 551-552.

NAME: after the locality, the *Kreuzberg*.

##### PHYSICAL PROPERTIES.

Color, white to yellowish; cleavage pinacoidal (c). Sp. gr. 2.139.

##### CRYSTALLOGRAPHIC PROPERTIES

Orthorhombic holohedral.  $a : b : c = 0.3938 : 1 : 0.5261$ . Forms: b(010), o(111), q(011). The pyramid is dominant.

##### OPTICAL PROPERTIES

Mean  $n = 1.62$ ; birefr. = 0.02; optic axial plane (001);  $2V$  about  $90^\circ$ ; sign —

##### CHEMICAL PROPERTIES

Only sufficient material for qualitative analysis was available. Chiefly an Al phosphate, with little Fe, Mn,  $\text{H}_2\text{O}$ , and doubtful F.

##### OCCURRENCE

Of late formation, in cavities in quartz, often on corroded earlier phosphates in pegmatite at the Kreuzberg of Pleystein. Among these, triplite was identified by its optical properties and an analysis, showing 25.42 MnO. Apatite of probable primary origin is present. The secondary phosphates form the following series: (1) Dufrenite (kraurite); (2) strengite, phosphosiderite, and the new mineral kreuzbergite; (3) vivianite, beraunite and cacoxenite; and (4) "Eisenpecherz" (colloidal iron hydroxide). The strengite crystals are described in detail;  $a : b : c = 0.8663 : 1 : 0.9776$ ; analysis gave

the normal formula,  $\text{Fe}_2\text{O}_3 \cdot \text{P}_2\text{O}_5 \cdot 8\text{H}_2\text{O}$ , altho there is a difficultly explainable excess of Fe. The phosphosiderite is also fully described;  $a : b : c = 0.5456 : 1 : 0.8905$ ; analysis agreed well with  $\text{Fe}_2\text{O}_3 \cdot \text{P}_2\text{O}_5 \cdot 7\text{H}_2\text{O}$ . The appearances of all the phosphate minerals in thin section are described.

In many respects this pegmatite resembles two others, of which full descriptions are given. That at Marchaney contains tourmaline, garnet, mica, sillimanite, staurolite, graphite, and various phosphates, the principal one being vivianite, with intergrown "kraurite" (dufrenite), and triplite.

That at Wildenau-Plössberg contains among other minerals beryl, pyrite and arsenopyrite. There are also large masses of triplite, and some secondary apatite, dufrenite, cacoxenite, beraunite, phosphosiderite, and strengite; a mineral in minute rhombic crystals with  $n = 1.60$  to  $1.65$ , probably reddingite; and also columbite and autunite.

#### DISCUSSION

Noted to be crystallographically distinct from lucinite. [But if  $a$  is doubled, gives  $a : b : c = 0.7876 : 1 : 0.5261$ , which is very close to childrenite,  $\text{Fe}''\text{Al}(\text{OH})_2\text{PO}_4 \cdot \text{H}_2\text{O}$ , with  $a : b : c = 0.7780 : 1 : 0.5258$ , and as it may well represent a variety of that species, with its properties somewhat modified by isomorphous replacement, it should not as yet be assigned species rank.]

E. T. W.

#### FAMILY 7. PHOSPHATES, ARSENATES, ETC. DOUBTFUL SPECIES.

##### Phosphoferrite

LAUBMANN and STEINMETZ, *op. cit.*, pp. 569-570.

NAME: from its composition, *phosphate* of iron (*ferrum*).

##### PHYSICAL PROPERTIES

In dense to columnar crystalline masses. Luster strongly greasy; color white to yellowish or pale greenish. Cleavage partial in one direction; fracture splintery to conchoidal.  $H = 4-5$ ; sp. gr. 3.165. Optically biaxial, +, otherwise similar to phosphophyllite (above).

##### CHEMICAL PROPERTIES

Analysis by Dr. Spengel gave, after deducting 5.13% insoluble matter: FeO 42.89, MnO 2.62, CaO 5.63, MgO 6.59,  $\text{P}_2\text{O}_5$  37.31, ign. 4.96, sum 100.00%. This is suggested to correspond to an acid phosphate,  $\text{H}_2\text{R}''(\text{PO}_4)_2$  [but the "ign." may be in part F.]

##### OCCURRENCE

In quartz, mica, sphalerite, and triphylite or triploidite, in the pegmatite at Habendorf.

##### DISCUSSION

[The data are insufficient to justify considering this species established. It is rather near sarcopside (*Am. Min.* 5, 99-102, 1920) which has RO 62,  $\text{P}_2\text{O}_5$  35 and F 5%, and it may be the hydroxy-representative of that mineral,  $\text{R}_7(\text{OH})_2(\text{PO}_4)_4$ .]

E. T. W.

## FAMILY 7. PHOSPHATES, ARSENATES, ETC. DOUBTFUL SPECIES.

**Xanthoxenite**

LAUBMANN and STEINMETZ, *op. cit.*, 579-580: ("Xanthoxen").

NAME: From the yellow color (Gk. *Xanthos*.) and the close relationship to *cacoxenite*.

## CRYSTALLOGRAPHIC AND OPTICAL PROPERTIES

In thin plates, under the microscope, seen to be monoclinic. Extinction angle  $36^\circ$ ; pleochroism strong. Birefr. about like that in *cacoxenite*, ( $n = 1.61$ ) but  $n$  higher. Axial angle,  $2E$ , about  $115^\circ$ . Sp. gr. 2.844.

## CHEMICAL PROPERTIES

Dissolves in acid readily. Could not be sufficiently separated from intergrown minerals for quantitative analysis. The  $P_2O_5$  content is 32.61%, and qualitative examination shows also Fe, chiefly ferric, also less Mn and Ca, with a little Al and Mg. There is 16.10%  $H_2O$ , which is lost only at a high temperature.

## OCCURRENCE

Intimately intergrown with *dufrenite*, and especially with *cacoxenite* in the mass of secondary phosphates, to some extent at Habendorf (see above under phosphophyllite) but especially at the quartz quarry at Hühnerkobel, Rabenstein. Here occur beryl, muscovite, "pseudo-triplite," columbite, abundant accessory triphylite, in part altered into *dufrenite*, etc. Another type of alteration is into *heterosite* and some *purpurite*. *Apatite* is present, also its alteration products; some *autunite* and *uranocher*. *Tourmaline* is rare. The secondary phosphates comprise *dufrenite*, *cacoxenite*, *vivianite*, rarely secondary *apatite*, and *fairfieldite*, (once called "leucomanganite"). This is determinable by its optical properties, and is probably what has been reported as "wavelite." *Phosphosiderite*, *strengite*, and *beraunite* are prominent.

## DISCUSSION

[The data are inadequate to establish this as a species. It approaches *beraunite* ( $P_2O_5$ , 31,  $H_2O$  16%) and may be a variety.] E. T. W.

## ABSTRACTS—MINERALOGY

THE MINERALS OF GLAMORGAN. F. J. NORTH. *Trans Cardiff Nat. Soc.* 49, 18-51, 1916-7.

An account of 31 species found in the county. Rare minerals reported include gold, *millerite*, *linneite*, *minium*, and *barytocalcite*. S. G. G.

STUDIES ON THE MINERALS, THE GENESIS, AND THE GEOLOGY OF DEPOSITS OF NITER. P. N. CHIRVINSKY. *Izv. Polyt. Inst. Novocheerkassk*, 5, 36-64, 1916. [Russian with French abstract.]

A summary of data on the nitrate minerals, with descriptions of their occurrence, especially in Russia.  $KNO_3$ ,  $NaNO_3$ ,  $Mg(NO_3)_2$  and  $NH_4NO_3$  occur in Turkestan. W. F. H.