

## NEW MINERAL NAMES

MICHAEL FLEISCHER

**Ikaite**

HANS PAULY, Ikaite, nyt mineral der danner skaer. *Naturens Verden*, June, 1963, 11 pp.

White, chalk-like skerries of columnar shape occur in the inner part of Ika fjord, 8 km south of Ivigtut, Greenland. The skerries form pillars reaching to within half a meter of the water surface. The temperature at the base was 3° C., at the top of the pillars 7° C. Samples collected by a frogman were shipped in a refrigerator at about 4° C. Analysis gave H<sub>2</sub>O 54.8%, loss on ignition of dry material 44.4%, Ca (dry material) 39.3%, Mg (dry material) 0.46%. This corresponds to CaCO<sub>3</sub>·6H<sub>2</sub>O. The optical properties were biaxial, ( ),  $\alpha \sim 1.455$ ,  $\beta \sim 1.538$ ,  $\gamma \sim 1.545$ , 2V about 45° (not measured), close to those given by Johnston, Merwin and Williamson, *Am. Jour. Sci.* **41**, 473 (1916) for CaCO<sub>3</sub>·6H<sub>2</sub>O.

The name is for the locality.

DISCUSSION.—The name was approved by the Commission on New Minerals, IMA. X-ray study would be highly desirable.

**Chromatite**

F. J. ECKHARDT AND W. HEIMBACH, Ein natürliches Vorkommen von CaCrO<sub>4</sub> (Chromatit). *Naturwissenschaften*, **50** (19), 612 (1963).

Finely crystalline citron-yellow material, collected from cleft surfaces in Upper Cretaceous limestones and marls along the Jerusalem-Jericho highway in Jordan, was identified as CaCrO<sub>4</sub>. No analytical data are given. X-ray study gave  $a$  7.26 ± 0.01,  $c$  6.26 ± 0.02 Å, Clouse, *Zeit. Krist.* **83**, 161-171 (1932) gave  $a$  7.25,  $c$  6.34 Å, space group  $D^{19}_{3h}I4_1/am\bar{d}$ , for CaCrO<sub>4</sub>. The mineral is uniaxial (+), non-pleochroic,  $\omega$  1.81-1.85,  $\epsilon$  1.84-1.88, birefringence 0.03; synthetic CaCrO<sub>4</sub> has  $\omega$  1.81,  $\epsilon$  1.84. The mineral occurs with gypsum; the grain size is 30 to 100 microns. No cleavage, fracture conchoidal.

**Zellerite**

H. G. GRANGER, Mineralogy. in, Geology and technology of the Grants uranium region: *New Mexico Bur. Mines Mineral Resources Mem.* **15**, 21-37 (1963).

"Zellerite" is mentioned as an uranium carbonate identified by R. G. Coleman (unpublished) from the Gas Hills, Wyoming. A "seemingly identical mineral" from the Alta mine, Grants District, New Mexico, is stated to be a premining mineral that occurs as a very fine-grained aggregate intergrown with gypsum on bedding-plane fractures. It also forms thin, warty, microbotryoidal crusts and minute hemispherical aggregates in openings along these fractures. It is yellow with pale greenish-yellow fluorescence. The four strongest lines of the x-ray pattern are 9.12, 3.80, 4.72, and 4.29 Å. No other data are given.

DISCUSSION.—Names should not be given without adequate description.

**Indite, Dzhallindite**

A. D. GENKIN AND I. V. MURAV'eva, Indite and dzhallindite, new indium minerals: *Zapiski Vses. Mineralog. Obshch.* **92**, 445-457 (1963) (in Russian).

Some years ago cassiterite from the Dzhallindin deposit, Little Khingan Ridge, Far Eastern Siberia, was found to be unusually rich in indium, part of which was readily dissolved by dilute acids. Detailed study has now proved the presence of a primary indium mineral, indite (FeIn<sub>2</sub>S<sub>4</sub>) and a supergene one, dzhallindite (In(OH)<sub>3</sub>).

Indite occurs in grains mostly less than 0.2 mm, rarely up to 0.5 mm. Color iron-black, luster metallic. Isotropic in reflected light, color white, reflecting power (Na) 27–28%. Scratched by a steel needle; microhardness 309 kg/sq.mm. Microspectrographic analysis on 8 micrograms gave Fe 8.84, In 59.30, S 31.85%; this corresponds to  $\text{Fe}_{0.6}\text{In}_2\text{S}_4$ . Other analyses (not given) gave the range  $\text{Fe}_{0.6-1.0}\text{In}_{1.2-2.4}\text{S}_4$ . Most etch reagents do not affect indite, but it is etched by concentrated  $\text{HNO}_3$  and dissolved by hot-fuming  $\text{H}_2\text{SO}_4$ .

X-ray powder data, in close agreement with those of Hahn and Klingler (*Zeit. anorg. allgem. Chem.* **263**, 177–190, 1950) on synthetic  $\text{FeIn}_2\text{S}_4$ , gave  $a$   $10.62 \pm 0.01$  Å. (H. and K. gave  $10.598 \pm 0.009$  Å).  $G$  4.67 (calc.). The strongest lines of indite are 3.20 (10)(311), 1.877 (9)(440), 1.085 (8)(844), 2.05 (7) (511,333), 1.028 (7)(773), 3.76 (5)(220), 1.384 (5)(731), 1.228 (5)(751,555). Space group  $Fd\bar{3}m$ .

Dzhalindite is a yellow-brown supergene alteration product of indite. In section it is isotropic, pale yellow,  $n$   $1.725 \pm 0.002$ . In reflected light dark gray, reflecting power (Na) 8.2%.

Microspectrographic analysis showed In, Fe, a little  $\text{SiO}_2$  (quartz), but no S. Quantitative analysis gave In:Fe=0.78:0.16. It is uncertain whether the Fe is present in the mineral, or as admixed Fe hydroxide; the authors believe that the latter is the case. The mineral is etched by HCl (1:1 and conc.),  $\text{H}_2\text{SO}_4$  (1:1 and conc.), but not by  $\text{HNO}_3$ ,  $\text{FeCl}_3$ , KOH or KCN.

X-ray powder data showed dzhalindite to be cubic,  $a$   $7.95 \pm 0.01$  Å, in close agreement with powder patterns of synthetic  $\text{In}(\text{OH})_3$  given by Roy and Shafer (*Jour. Phys. Chem.* **58**, 372, 1954) and others with  $a$  7.90–7.958 Å. With  $Z=8$  ( $\text{In}(\text{OH})_3$ ),  $G$  calc. is 4.34. The strongest lines of dzhalindite are 3.96 (10)(200), 2.80 (9)(220), 1.778 (9)(420), 1.624 (7)(422), 2.29 (6)(222), 1.324 (6)(600,442). A sample heated at  $500^\circ$  for 30 minutes gave the powder diagram of  $\text{In}_2\text{O}_3$ .

The names are for the composition and for the Dzhalind ore deposit. Samples have been deposited in the Mineralogical Museums of the Academy of Sciences, Moscow, and the Leningrad Mining Institute.

DISCUSSION.—These are evidently valid mineral species. Indite should be classified with daubreelite; dzhalindite is not analogous to any hydroxides for Fe, Al or Mn. It is interesting to note that these are the second and third known indium minerals—all described in 1963!

#### Yttrobetafite

A. P. KALITA, A. V. BYKOVA AND M. V. KUKHARCHIK, Varieties of pyrochlore and betafite in pegmatites. *Trudy Inst. Mineral. Geokhim Kristalokhim Redkikh Elementov* **8**, 210–211 (1962).

A. P. KALITA, New data on some minerals of the Alakurtti veins: *Ibid* **2**, 164–172 (1959), from an abstract by E. M. BONSHTEDT-KUPLETSKAYA AND T. A. YAKOVLEVSKAYA in *Zapiski Vses. Mineralog. Obshch.* **92**, 570 (1963).

Two analyses by M.V.K. gave  $\text{Nb}_2\text{O}_5$  27.87, 36.35;  $\text{Ta}_2\text{O}_5$  7.73, 8.50,  $\text{TiO}_2$  15.20, 14.90;  $\text{ZrO}_2$  0.11, —;  $\text{Fe}_2\text{O}_3$  4.30, 4.00;  $\text{Al}_2\text{O}_3$  0.86, 0.98;  $\text{MnO}$  0.75, 1.10;  $\text{MgO}$  0.09, 0.30;  $\text{CaO}$  2.23, 1.66;  $\text{Na}_2\text{O} + \text{K}_2\text{O}$  0.20, 0.34;  $\text{PbO}$  0.55, —;  $\text{UO}_2$ —, 0.20;  $\text{U}_3\text{O}_8$  12.84, —;  $\text{UO}_3$ —, 5.80;  $\text{ThO}_2$  1.20, 0.90;  $\text{Y}_2\text{O}_3$  10.60, 5.12;  $\text{Ce}_2\text{O}_3$  6.03, 4.01;  $\text{SiO}_2$  3.40, 3.92;  $\text{H}_2\text{O}^-$  1.20, 5.80;  $\text{H}_2\text{O}^+$  4.47, 5.93; F 0.30, —; total 99.93–0.12=99.81, 99.88%. The DTA curve shows an endothermic effect at 200–300° and an exothermic one at about 700°.

Greenish, luster dull; on fresh fracture darker in color and has a greasy luster. Metamict. After heating at  $900^\circ$  gives an x-ray pattern with strongest lines at 1.694 (10), 3.258 (8), 2.985 (7), 2.501 (6), 1.180 (6).  $G$  3.65–4.90.

Occurs in quartz-plagioclase-microcline pegmatite at Alakurtti, NW. Karelia, associ-

ated with obrucheveite in albitic and muscovitic replacement zones. Locally replaces obrucheveite.

DISCUSSION.—Unnecessary name for intermediate members of the series pyrochlore-obrucheveite.

#### Korzhinskite

S. V. MALINKO, A new calcium borate, korzhinskite. *Zapiski Vses. Mineralog. Obshch.* **92**, 555–559 (1963) (in Russian).

The mineral was found in skarn from which the new calcium borates calciborite, frolovite, nifontovite, uralborite, pentahydroborite and sibirskite have been previously reported (*Am. Mineral.* **41**, 815 (1956); **43**, 385 (1958); **47**, 162, 1482 (1962); **48**, 434 (1963)). The mineral could not be separated pure. Chemical and DTA analyses were made on material containing the mineral plus sibirskite, calciborite, calcite and a little andradite-grossular garnet and dolomite. Thin-section study of 5 samples showed korzhinskite 31.9–50.5, av. 39.9; sibirskite 38.2–64.0, av. 52.9, calciborite 1.3–12, av. 7.2%. Spectrographic analysis showed only Ca and B major.

The chemical analysis (by G. A. Sinyugina, N. N. Kuznetsova and V. I. Yurchenkov) gave  $B_2O_3$  22.87, CaO 50.12, MnO 0.15, MgO 0.26,  $TiO_2$  none, FeO trace,  $Fe_2O_3$  0.80,  $Al_2O_3$  0.30,  $SiO_2$  1.26,  $CO_2$  18.41,  $H_2O$  0.62,  $H_2O^+$  5.29, sum 100.08%. After deducting dolomite, calcite, and garnet, and the proportions of sibirskite and calciborite indicated above, the residue left for korzhinskite gives  $CaO \cdot 1.05B_2O_3 \cdot 1H_2O$  or  $CaB_2O_4 \cdot H_2O$ .

The DTA study showed, besides effects due to calciborite, sibirskite, and calcite, an endothermal effect at 333–358° and an exothermal one at about 700°, ascribed to korzhinskite. Soluble in acids at room temperature.

The mineral is colorless, transparent. It occurs in lamellar aggregates of grains of prismatic habit. It replaces calciborite, calcite, anhydrite and dolomite. There is a cleavage in the direction of elongation. Optically biaxial (+),  $2V = 43.6^\circ$  (mean of 8 determinations); (by Yu. A. Cherkasov)  $\alpha$  1.642,  $\beta$  1.647,  $\gamma$  1.672, all  $\pm 0.001$ . Extinction parallel.  $X \perp$  to cleavage plane, Y and Z lie in the cleavage plane. Twinning observed in some sections; the twinning axis is at angles of  $6^\circ$  with Z,  $85^\circ$  with X.

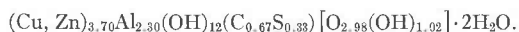
X-ray powder data by G. A. Sidorenko (20 lines) differ from those of any other calcium borate. The strongest lines are 1.370 (10), 3.11 (7), 2.81 (7), 1.757 (4).

The name is for Academician Dmitri Sergeevich Korzhinskii.

#### Carbonate-Cyanotrichite

E. A. ANKINOVICH, I. I. GEKHT AND R. I. ZAITSEVA, A new variety of cyanotrichite—carbonate-cyanotrichite. *Zapiski Vses. Mineralog. Obshch.* **92**, 458–463 (1963) (in Russian).

Analysis by R. I. Z. gave CuO 44.40, ZnO 0.62, CaO 0.55, MgO 0.26,  $V_2O_4$  0.16,  $Al_2O_3$  18.10,  $CO_2$  5.20,  $SO_3$  4.05,  $H_2O^+$  22.90,  $H_2O^-$  1.45,  $SiO_2$  2.98, total 100.67%. Spectrographic analysis also showed Ni 0.01, Mo 0.001, Ba 0.001%. After deducting 2.98% quartz, 0.88% dolomite, 0.50% calcite, and 0.80%  $H_2O^-$ , this corresponds to



X-ray powder data by P. T. Tazhibaeva and V. B. Makarov are given; they correspond closely to those for cyanotrichite. The strongest lines are 4.21 (100), 10.13 (93), 5.03 (60), 3.33 (58), 2.01 (53), 2.51 (52), 2.77 (45), 5.63 (43).

The mineral occurs in lustrous silky pale blue to azure fibrous aggregates. Hardness

uncertain, apparently not above 2.  $G$  2.65, 2.67. Optically biaxial (+),  $2V$  55–60°,  $\alpha$  1.616,  $\gamma$  1.677, both  $\pm 0.002$ . Elongation negative, extinction parallel. Pleochroism strong, bright blue on  $Z$ , colorless on  $X$ . Dispersion strong,  $r > v$ . A DTA curve shows endothermal effects at 190°, 300°, and 800° and an exothermal effect at 640°. Data on dehydration are given. The loss in weight is 6% up to 150°, 6% more to 250°, and 12% more to 400°.

The mineral occurs in the crust of weathering of Middle Cambrian shales of northwestern Kara-Tau at several localities, mainly as crystalline crusts on cleavage surfaces and in cavities. Individual crystals are elongated platelets up to 4–5 mm long. It is formed later than alunite, jarosite, brochantite, and phosphates and vanadates of Al and Fe and before azurite, malachite and spangolite.

Samples have been deposited in the Mining Museum, Leningrad.

#### Zhemchuzhnikovite, Stepanovite

YU. N. KNIPOVICH, A. I. KOMKOV AND E. I. NEFEDOV, On stepanovite and the new mineral zhemchuzhnikovite. *Trudy Vses. Nauchno-Issled. Geol. Inst. (V.S.E.G.E.I.)*, **96**, 131–135 (1963) (in Russian).

Preliminary notes were abstracted in *Am. Mineral.* **40**, 551 (1955) and **47**, 1482–1483 (1962). Zhemchuzhnikovite was found in veinlets in coal in the Chaitumussk deposits, 200 km from the estuary of the Lena River. Analysis by Y.N.K. gave Na 4.22, K 0.10, Mg 5.17, Mn 0.05, Al 3.25,  $Fe^{3+}$  4.16,  $C_2O_4$  (oxalate) 52.40,  $H_2O$  29.09, insol. (coal) 1.13, sum 99.57%, corresponding closely to  $NaMg(Al, Fe^{3+})(C_2O_4)_3 \cdot 8.3H_2O$ , with Al:Fe = 1.22:0.75. The mineral is easily soluble in water and can be recrystallized from the aqueous solution; pH of solution 5.51. About half the water is lost at 85°, the rest at 130°. When heated, it blackens and finally gives an infusible yellow-brown residue.

The mineral is trigonal, with forms  $c$  [0001],  $a$  [1120],  $e$  [2241]. Natural crystals are acicular to fibrous, synthetic crystals are hexagonal, prismatic. Laue and rotation photographs (A.I.K.) confirm the trigonal symmetry, with  $a$   $16.67 \pm 0.05$ ,  $c$   $12.51 \pm 0.03$  kX,  $a:c = 0.75$  (x-ray), 0.739 (goniometric),  $Z = 6$ .

Cleavage basal, average. X-ray powder data are not given.

The mineral is smoky-green, with vitreous luster. Synthetic crystals are green in daylight, amethyst-violet under electric lights.  $H$  2,  $G$  1.69 (observed), 1.66 (calc.). Optically uniaxial (–),  $\omega$  1.479,  $\epsilon$  1.408. Pleochroic,  $\omega$  greenish-yellow;  $\epsilon$  reddish-violet.

Stepanovite occurs similarly in the Tyllakh coal deposit in the estuary of the Lena River. Analysis by Y. N. K. gave Na 4.48, K none, Mg 4.68,  $Fe^{2+}$  none, Al none,  $Fe^{3+}$  10.78,  $C_2O_4$  (oxalate) 50.36,  $H_2O$  29.73, sum 100.03%, corresponding closely to  $NaMgFe^{3+}(C_2O_4)_3 \cdot 8.5 H_2O$ . Easily soluble in water and can be recrystallized from aqueous solution; pH of solution 5.22. The behavior on heating is the same as for zhemchuzhnikovite.

Laue and rotation photographs (A.I.K.) show that stepanovite is trigonal, with  $a$  9.28,  $c$  36.67 kX,  $a:c = 1:3.73$  (x-ray), 1:3.761 (goniometric),  $Z = 6$ . Forms noted were  $c$  [0001],  $a$  [1120],  $d$  [0112],  $q$  [1014],  $Z$  [5142]. X-ray powder data are not given. It occurs as xenomorphic grains; synthetic crystals are rhombohedral or hexagonal prismatic, with twinning on {0001}. No cleavage observed, fracture irregular.

The mineral is greenish with vitreous luster,  $H = 2$ ,  $G$  1.69 (obs.), 1.69 (calc.). Optically uniaxial (–),  $\omega$  1.515,  $\epsilon$  1.417. Pleochroic,  $\omega$  yellow-green,  $\epsilon$  colorless.

The minerals are chemically similar Al and  $Fe^{3+}$  compounds, but apparently structural distinct.

The names are for Yuri Appollonovich Zhemchuzhnikov (1885–1957) and Pavl Ivanovich Stepanov (1880–1947), Russian geologists.

DISCUSSION.—Professor L. G. Berry has kindly pointed out that the data given for

$a:c$  and  $Z$  of stepanovite are inconsistent with the value  $a$  9.28 kX; perhaps it is a typographical error for  $a$  9.78 kX.

### Hydrocatapleite

E. I. SEMENOV AND I. P. TIKHONENKOV, Catapleite and hydrocatapleite of alkalic pegmatites. *Trudy Inst. Mineral., Geokhim. Kristallogchim Redkikh Elementov* **9**, 88–93 (1962), from an abstract by E. N. BONSHTEDT-KUPLETSKAYA AND T. A. YAKOVLESKAYA in *Zapiski Vses. Mineralog. Obshch.* **92**, 575 (1963).

Name given to an alteration product of catapleite from albitic pegmatite, Mt. Partomchorr, Khibina Tundra, Kola. Analysis by M. E. Kazakova gave  $\text{SiO}_2$  21.32,  $\text{ZrO}_2$  50.74,  $\text{TiO}_2$  0.18,  $\text{Nb}_2\text{O}_5$  1.96,  $\text{MgO}$  0.11,  $\text{CaO}$  1.05,  $\text{Na}_2\text{O}$  2.35,  $\text{K}_2\text{O}$  0.38,  $\text{H}_2\text{O}^-$  8.33,  $\text{H}_2\text{O}^+$  10.50, sum 98.12%.  $G$  2.60,  $\alpha$  1.62,  $\gamma$  1.64. The DTA curve is like that of catapleite but with an additional endothermic effect at  $170^\circ$ . The  $x$ -ray pattern is like that of catapleite but the lines are more diffuse.

DISCUSSION.—The abstractors state, "Introduction of a name for a product of alteration that is insufficiently characterized is inexcusable and superfluous." I agree!

### Unnamed Minerals of Datolite Group

E. I. SEMENOV, V. D. DUSMATOV AND N. S. SAMSONOVA, Yttrium-beryllium minerals of the datolite group. *Kristallografiya*, **8**, 677–679 (1963) (in Russian).

Two new minerals are described that belong to the datolite group, which includes datolite,  $\text{Ca}_2\text{B}_2\text{Si}_2\text{O}_8(\text{OH})_2$ , homilite,  $\text{Ca}_2\text{FeB}_2\text{Si}_2\text{O}_{10}$ , and gadolinite,  $\text{Y}_2\text{FeBe}_2\text{Si}_2\text{O}_{10}$ .

The first, here called mineral A, occurs in microcline-arfvedsonite pegmatites of alkalic syenites, Alaisk Ridge, Tadzhikistan, associated with quartz, astrophyllite, zircon, pyrochlore and stillwellite in interstices between large crystals of arfvedsonite. The second, here called mineral B, occurs in granitic pegmatite, southeastern Tuva, in the albitized part of the vein, with muscovite, spodumene and pyrochlore. The pegmatite also contains fergusonite, fluorite, helvite, cassiniterite and calcite. Analyses gave:

	Mineral A	Mineral B
$\text{SiO}_2$	27.92	32.50
$\text{P}_2\text{O}_5$	—	4.95
$\text{B}_2\text{O}_3$	10.86	—
$\text{BeO}$	5.09	11.13
$\text{Al}_2\text{O}_3$	none	1.50
$\text{TiO}_2$	0.32	—
$\text{Nb}_2\text{O}_5$	—	3.78
$\text{FeO}$	3.90	1.26
$\text{MgO}$	—	0.28
$\text{CaO}$	11.43	6.98
$\text{RE}_2\text{O}_3$	35.60	26.33
$\text{ThO}_2$	1.33	1.32
$\text{H}_2\text{O}$	3.38	8.92
	99.83	98.95

Analyst Bykova and Sidorenko M. E. Kazakova

Mineral A corresponds approximately to  $(\text{RE}, \text{Ca})_2(\text{B}, \text{Be})_2\text{Si}_2\text{O}_8(\text{OH})_2$ , with  $\text{RE}:\text{Ca}=2.4$  and  $\text{B}:\text{Be}=1.5$ . Mineral B corresponds approximately to  $(\text{RE}, \text{Ca})_2\text{Be}_2\text{Si}_2\text{O}_8(\text{OH})_2$ =excess

H<sub>2</sub>O, with RE: Ca=3. X-ray spectrographic analyses by R. L. Barinskii of the rare earths ( $\sum \text{RE}_2\text{O}_3=100$ ) gave, respectively, for Mineral A and Mineral B, La<sub>2</sub>O<sub>3</sub> 0.7, 1.8; Ce<sub>2</sub>O<sub>3</sub> 7.3, 7.2; Pr<sub>2</sub>O<sub>3</sub> 2.7, 2.6; Nd<sub>2</sub>O<sub>3</sub> 3.7, 7.4; Sm<sub>2</sub>O<sub>3</sub> 5.8, 7.3; Eu<sub>2</sub>O<sub>3</sub> 0.4, 0.5; Gd<sub>2</sub>O<sub>3</sub> 8.4, 8; Tb<sub>2</sub>O<sub>3</sub> 1.0, 1.1; Dy<sub>2</sub>O<sub>3</sub> 7.7, 6; Ho<sub>2</sub>O<sub>3</sub> 1.6, 0.9; Er<sub>2</sub>O<sub>3</sub> 5.5, 3; Tm<sub>2</sub>O<sub>3</sub> 0.6, 0.6; Yb<sub>2</sub>O<sub>3</sub> 4.4, 3.3; Lu<sub>2</sub>O<sub>3</sub> 0.3, 0.6; Y<sub>2</sub>O<sub>3</sub> (approx.) 50, 50%.

The x-ray pattern of Mineral A is close to that of datolite but has fewer lines (11 given); the strongest lines are 2.83 (10), 3.09 (9), 2.54 (7), 2.19 (5). The unit cell is given as  $a$  9.86,  $b$  7.48,  $c$  4.66 Å,  $\beta$  88°30'. X-ray powder data are not given for Mineral B; the unit cell is given as  $a$  10.20,  $b$  7.80,  $c$  4.90 Å,  $\beta$  92°.

Mineral A occurs in grains and prismatic crystals up to 5 mm. Greenish-gray to colorless, transparent, luster greasy.  $G$  3.78, microhardness 78° kg/sq mm. Optically biaxial (—),  $2V$  75°,  $\alpha$  1.720,  $\gamma$  1.731.

Mineral B has a pale rose color, luster vitreous to greasy. Fracture uneven.  $G$  3.44, microhardness 1100 kg/sq mm. Optical sign not given;  $\alpha$  1.708,  $\gamma$  1.722.

### Spiroffite

J. A. MANDARINO, S. J. WILLIAMS AND R. S. MITCHELL, Spiroffite, a new tellurite mineral from Moctezuma, Sonora, Mexico. *Mineral. Soc. Am. Spec. Paper* 1, 305–309 (1963)

See the abstract published in *Am. Mineral.* 47, 196 (1962). Additional data given include an indexed x-ray powder pattern with strongest lines 4.98 (S+)(110), 3.00 (S+)(004), 4.06 (S)(202), 3.31 (S)( $\bar{3}11$ ), 1.63 (ms). The mineral fuses in a gas flame and in both open and closed tubes. Easily soluble in cold HCl to a yellow solution, not dissolved by hot HNO<sub>3</sub> or hot H<sub>2</sub>SO<sub>4</sub>.

### Sangarite

V. A. DRITS AND A. G. KOSSOVSKAYA, Sangarite, a new clay mineral with ordered mixed-layer structure. *Doklady Akad. Nauk SSSR* 151, 934–937 (1963) (in Russian).

An unusual alteration product of biotite, superficially similar to chlorite, is characterized in detail. It is pale green, non-pleochroic, with indices 1.618–1.620; birefringence low. It coats terrigenous grains in Mesozoic sands of the Vilui depression and Priverkhoyonsk downwarp (Sangar region). Chemical analysis of material composed predominantly of the described mineral is SiO<sub>2</sub> 33.8, TiO<sub>2</sub> 1.56, Al<sub>2</sub>O<sub>3</sub> 18.38, Fe<sub>2</sub>O<sub>3</sub> 7.57, FeO 15.15, MgO 9.11, CaO 1.32, Na<sub>2</sub>O 0.48, K<sub>2</sub>O 2.05, H<sub>2</sub>O 10.33, CO<sub>2</sub> 0.19, C 0.2, total 100.14%.

A DTA curve indicates a small water loss at 150° C., a prominent endothermic feature at 550° C., and a small exothermic feature at 890° C.

The unusual aspect of the mineral is described in terms of the x-ray diffraction character. 00l diffraction features are observed up to the 20th order. The structure consists of approximately regularly alternating trioctahedral chlorite-like layers of two types, related to but differing somewhat from the scheme deduced for corrensites. Each two talc-like layers are united in alternation by brucite-like nets and by less densely populated water bearing nets of composition between vermiculite and chlorite interlayer character, not swellable in glycerol. Iron content is concentrated in the second kind of interlayer population. The state could be roughly described as the alternation of an ortho- with a leptochlorite. Stability of the mineral toward heat treatments and toward KCl and NH<sub>4</sub>Cl is consistent with the structural deductions. The name is for the area.

DISCUSSION.—The introduction of a new name to apply to one so carefully analyzed example of a structure which will apparently emerge to be infinitely variable is unwise.

Naming should be deferred pending equally intense study of coarser grained, better cleaned chloritic products.

W. F. BRADLEY

**Anthonyite**,  $\text{Cu}(\text{OH}, \text{Cl})_2 \cdot 3\text{H}_2\text{O}$

**Calumetite**,  $\text{Cu}(\text{OH}, \text{Cl})_2 \cdot 2\text{H}_2\text{O}$

S. A. WILLIAMS, *Am. Mineral.* **48**, 614–619 (1963)

**Antimonpearceite**,  $(\text{Ag}, \text{Cu})_{16}(\text{Sb}, \text{As})_2\text{S}_{11}$

**Arsenpolybasite**,  $(\text{Ag}, \text{Cu})_{16}(\text{As}, \text{Sb})_2\text{S}_{11}$

CLIFFORD FRONDEL, *Am. Mineral.* **48**, 565–572 (1963).

**Barnesite**,  $\text{Na}_2\text{V}_6\text{O}_{16} \cdot 3\text{H}_2\text{O}$

A. D. WEEKS, D. R. ROSS AND R. F. MARVIN, *Am. Mineral.* **48**, 1187–1195 (1963).

**Galeite**,  $\text{Na}_2\text{SO}_4 \cdot \text{Na}(\text{F}, \text{Cl})$

A. PABST, D. L. SAWYER AND GEORGE SWITZER, *Am. Mineral.* **48**, 485–510 (1963).

**Karelianite**,  $\text{V}_2\text{O}_3$

J. V. P. LONG, Y. VUORELAINEN AND OLAVI KOUVO, *Am. Mineral.* **48**, 33–41 (1963).

**Wegscheiderite**,  $\text{Na}_2\text{CO}_3 \cdot 3\text{NaHCO}_3$

J. J. FAHEY AND K. P. YORKS, *Am. Mineral.* **48**, 400–403 (1963).

D. E. APPLEMAN, *Am. Mineral.* **48**, 404–406 (1963).

#### NEW POLYTYPES

##### Högbomite 4H, 5H, 6H, 15H, 15R and 18R

DUNCAN MCKIE, The högbomite polytypes. *Mineral. Mag.* **33**, 563–580 (1963).

X-ray investigations of twenty högbomite crystals from several localities, reveal that högbomite exists as several polytypes (4H, 5H, 6H, 15H, 15R and 18R). The polytypes all have approximately the same *a* dimension, 5.72 Å. The *c* dimension is approximately equal to 4.6n Å, where n is the integer in the polytype designation. The general formula for 1/nth of a unit cell is  $(\text{Mg}, \text{Fe}, \text{Zn})_{1.0-1.6} \text{Ti}_{0.2-0.4} (\text{Al}, \text{Fe})_{3.7-4.3} \text{O}_{7.6-8.0} (\text{OH})_{0-0.4}$ . Högbomite is related structurally to nigerite-3H and taaffeite-4H.

J. A. MANDARINO

#### NEW DATA

##### Tangaite = Redondite

FRANTISEK CECH, PAVEL POVONDRA AND ERVIN SLANSKY, Beitrag zur Kenntniss von Redondit. *Acta Univ. Carolinae, Geol.* **1962**, (1–2), 21–38.

X-ray powder data are given on redondite from Ponikla and Listeneč, Czechoslovakia, from Redonda Island, and for tangaite from Tanganyika (*Am. Mineral.* **45**, 910, 1960). The data of McKie are confirmed; redondite (and tangaite) give patterns that are identical and distinct from those of variscite and clinovariscite. Analysis of redondite from Ponikla gave  $\text{Al}_2\text{O}_3$  34.65,  $\text{Fe}_2\text{O}_3$  0.34,  $\text{CuO}$  0.09,  $\text{P}_2\text{O}_5$  40.74,  $\text{H}_2\text{O}$  23.95, insol. 0.37, sum 100.14%, G 2.415. Although the type material was ferrian ( $\text{Fe}_2\text{O}_3$  14.40,  $\text{Al}_2\text{O}_3$  16.60%), the authors feel that the name redondite should be used for all material of this type with  $\text{Al} > \text{Fe}$  and the name tangaite is superfluous.

DISCUSSION.—The patterns given for redondite and variscite are, as the authors state, very similar. They emphasize the presence of a line at 6.42–6.47 (I 0.5–3) for redondite, not given by variscite. (This, however, is close to a line of clinovariscite at 6.37 Å, I=6). The most characteristic lines of redondite are given as 5.42 (8), 4.84 (7), 4.31 (10<sup>+</sup>), 3.06 (6), 2.714 Å. (8). For variscite is given: 5.34 (9), 4.83 (7), 4.27 (9), 3.03 (10), 2.71(1); for clinovariscite 4.77 (5), 4.25 (9), 3.12 (2), 2.71 (10). The birefringence (0.014–0.020) is also less than that of variscite (0.029). I am not yet convinced that this is a new modification of  $\text{AlPO}_4 \cdot 2\text{H}_2\text{O}$  and not variscite with a little admixed clinovariscite. The name tangaite should be dropped.

#### Hatchite

W. NOWACKI AND C. BAHEZRE, Die Bestimmung der chemischen Zusammensetzung einiger Sulfosalze aus dem Lengenbach (Binnatal, Kt Wallis) mit Hilfe der elektronischen Mikrosonde. *Schweiz. Mineralog. Petrog. Mitt.* **43**, 407–411 (1963).

Hatchite had never been analyzed (see Dana's System, 7th Ed., v. 1, 487). Electron probe analysis of material identified by *x*-ray study gave Tl 27.1±1, Pb 23.8±1, As 21.7±1, S 27.5± (1–2), total 100.1%. Hatchite is therefore a thallium lead arsenic sulfide.

DISCUSSION.—This gives approximately  $\text{TlPbAs}_2\text{S}_7$ .

#### Allevardite = Rectorite

G. BROWN AND A. H. WEIR, The identity of rectorite and allevardite. *Proc. Inter. Clay Conf.*, Stockholm, 1963, p. 27–36.

Chemical analyses, *x*-ray powder data (including data after treatment with glycerol after saturation with various cations), electron microscope photographs, and infra-red absorption spectra show that type rectorite and type allevardite are identical, the former containing about 12.5% dickite as impurity. The formula is calculated to be (anhydrous basis):



It is recommended that the name rectorite (Brackett and Williams, 1891) be kept.

#### Redefinition of Bementite and Caryopilite Ektropite (Ectropite) = Caryopilite

TOSHIO KATO, New data on the so-called bementite. *Jour. Jap. Assoc. Mineral., Petrol., Econ. Geol.* **49**, 93–103 (1963) (in Japanese).

Ten specimens of so-called bementite have been examined by means of *x*-ray and electron diffractions. The results of this study show that they are either one or mixtures of two different minerals.

One is the main constituent of bementite type specimen from Franklin, N. J. (USA) and is described as Franklin-type mineral in the text. It has the lattice constants of  $a=14.5$ ,  $b=17.5$ ,  $c=4 \times 7.28$  Å; diffraction aspect,  $P2_12_12_1$  (by *x*-ray) or  $p^{***}$  (by electron diffraction). The structure is considered to be close to that of friedelite group minerals.

The other, described as chamosite-type mineral in the text, is the essential component of the so-called bementite from other localities. The specimens described as ectropite and caryopilite belong to this type. This type of mineral has a serpentine-like structure.

On the contrary with antigorite, the electron diffraction patterns of this type of minerals show satellites along [010], [130] and  $[\bar{1}30]$ . They are interpreted as the result of some modulated structure due to misfits between tetrahedral and octahedral layers. A deficiency of  $\text{Mn}(\text{OH})_2$  from the ideal chemical formula, often observed in this type of mineral, seems to support the above interpretation.



With respect to the nomenclature, it is recommended to call the former, friedelite-like mineral, bementite; the latter, Mn-serpentine mineral, caryopilite.

(author's abstract)

DISCUSSION.—Kato's recommendations should be adopted. Caryopilite (Hamborg, 1889) has priority over ektropite (Flink, 1917).

### Fornacite

BARIAND, P. AND P. HERPIN, Nouvelles données sur la fornacite (chromo-arséniat de plomb et de cuivre). *Bull. Soc. Franç. Mineral.* **85**, 309–311 (1962).

Fornacite is monoclinic,  $P2_1/c$ ,  $a=7.91 \text{ \AA}$ ,  $b=5.91 \text{ \AA}$ ,  $c=17.46 \text{ \AA}$ ,  $\beta=109^\circ30'$ . It is biaxial (+), with  $\alpha=2.14 \pm 0.02$ ,  $\gamma=2.24 \pm 0.02$ . Crystals about 4 mm long are olive green; the streak is saffron yellow. Measured density  $6.27 \text{ gm/cm}^3 \pm 0.02$ .

Chemical analysis of a 4-gram sample of carefully purified material from Renéville, Congo, gave: PbO 57.16, CuO 10.91,  $\text{Fe}_2\text{O}_3$  0.40,  $\text{CrO}_3$  11.78,  $\text{As}_2\text{O}_5$  (misprinted as  $\text{As}_2\text{O}_3$ ) 15.03,  $\text{P}_2\text{O}_5$  0.66, "H<sub>2</sub>O combinée" 2.05, "H<sub>2</sub>O" 1.68, Sum 99.67, from which the authors derive the general formula  $(\text{Pb, Cu, Fe})_3[(\text{Cr, As, P})\text{O}_4]_2(\text{OH})$ . The calculated density, for unit-cell contents of 4 formula units, is given as  $6.40 \text{ g/cm}^3$ .

An indexed powder pattern of 41 lines has the following strong lines: 3.31, 10; 2.98, 10; 2.88, 10; 2.80, 10; 4.80, 0; 2.71  $\text{ \AA}$ , 9; the next strongest lines are rated as only half as intense as the strongest ones. The largest d-spacing reported is 8.22  $\text{ \AA}$ ; the smallest, 1.50  $\text{ \AA}$ .

The samples studied, from Renéville, Congo, and Sébarz, Iran, are deposited in the laboratory of mineralogy and crystallography at the Sorbonne.

DISCUSSION.—The Seventh Edition of Dana's *System* noted that fornacite needed verification. This paper and the earlier work of Guillemin and Prouvost (*Bull. Soc. Franç. Mineral.* **74**, 432–438, 1951) have established the mineral and indicate it to be closely related structurally and chemically to vauquelinite.

Because of calculation errors, the  $(\text{OH})^-$  in the formula proposed by Bariand and Herpin may be too low.

PRIESTLEY TOULMIN, III

### DISCREDITED MINERALS

#### Ferutite and Ufertite (=Davidite)

A. G. ZHABIN, A. A. VORONKOV, E. B. KHALEZOVA AND M. E. KAZAKOVA, New data on accessory davidite from Vishnevye Mt., Urals, and on the so-called ufertite and ferutite. *Trudy Inst. Mineral., Geokhim. i Kristalloghim Redkikh Elementov*, **15**, 110–121 (1963) (in Russian).

A new analysis of a non-metamict davidite, containing no uranium or thorium, is given from Vishnevye Mt., Urals. It agrees well with the formula of Pabst (*Am. Mineral.* **45**, 700–718, 1961),  $\text{As}_8\text{B}_{10}\text{O}_{36}$ . X-ray study of this and other samples, including samples of ufertite and ferutite from the type localities, shows that they are identical, with only minor variations in spacings and intensities. See *Am. Mineral.* **41**, 163–164 (1956); **43**, 378, 382 (1958).

#### Sjögruvite (=Arseniopleite)

ÅKE HENRIQUES, Sjögruvite (=Arseniopleite). *Arkiv Min. & Geol.* **3**, 395 (1963).

Sjögruvite was distinguished from arseniopleite by Igelström (*Zeit. Krist.*, **22**, 471–472, 1894) largely on the basis of its lighter color and streak. A powder photograph of the original material shows it to be identical with arseniopleite. In Dana's *System*, 7th ed., Vol. II, 845 (1951) sjögruvite is stated to be "perhaps a ferrian variety of arseniopleite."

The old analyses by Igelström show 11.29% Fe<sub>2</sub>O<sub>3</sub> in sjögruvite and 3.68% Fe<sub>2</sub>O<sub>3</sub> in arsenioleite. Most of the iron in sjögruvite seems, however, to belong to impurities, chiefly jacobsite.

A. PABST

**Ishiganeite (= Cryptomelane + Birnessite)  
Yokosukaite (= Nsutite)**

YU HARIYA, *Am. Mineral.* **48**, 952-954 (1963).

**Magnioborite (= Suanite)**

MARY E. MROSE AND MICHAEL FLEISCHER, *Am. Mineral.* **48**, 915-923 (1963).

**Rogersite (= Weinschenkite)**

E. WM. HEINRICH AND S. H. QUON, *Am. Mineral.* **48**, 1168-1170 (1963).

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Sir Arthur Russell died February 23, 1964 at the age of 85 at his home in Reading, England.