NEW MINERAL NAMES

M. FLEISCHER

Sonolite

MAYUMI YOSHINAGA, Sonolite, a new manganese silicate mineral. *Mem. Fac. Sci. Kyushi Univ., Ser. D, Geol.*, **14,** 1–21 (1963)

Analysis of material from the Hanawa mine gave SiO_2 22.37, TiO_2 0.09, Al_2O_3 2.56, FeO 0.93, MgO 3.45, MnO 62.01, CaO 0.73, BaO none, F 0.21, CO_2 4.53, H_2O^+ 3.08, H_2O^- 0.30, sum $100.26-(O=F_2)0.09=100.17\%$. This corresponds to $(Mn_{7.80}Fe_{0.16}Mg_{1.05}Ca_{0.16})_{9.17}(Si_{3.45}Al_{0.62}Ti_{0.01})_{4.08}O_{15.91}[(OH)_{1.95}F_{0.14}]_{2.09}$ or $4Mn_2SiO_4 \cdot Mn(OH, F)_2$, the manganese analogue of clinohumite. The mineral is decomposed by HCl leaving gelatinous silica.

Monoclinic, with *a* 10.66, *b* 4.88, *c* 14.33 Å, β 100°34′, Z=2 (*a* and *c* are interchanged from the setting for clinohumite). Single or lamellar twinning on {011} is common.

Color dull reddish orange. H 5.5, G 3.82 (meas.), 3.97 (calc.). Optically (−) with *ns*, α 1.763, β 1.779, γ 1.793 2V 75.5–82°, dispersion r>v, $X\wedge\{001\}=9–10°$. Colorless in thin section.

The mineral occurs as fine-grained, prismatic to anhedral crystals at the Sono, Hanawa, and other manganese mines, mostly in Paleozoic formations in Japan. Associated minerals are rhodochrosite, galaxite and pyrochroite.

The name is for the Sons Mine were it was first found.

DISCUSSION.—A member of the alleghanyite-leucophoenicite group.

KENZO YAGI

Beta-lomonosovite

V. I. GERASIMOVSKII AND M. E. KAZAKOVA, Beta-lomonosovite. *Doklady Akad. Nauk. SSSR*, **142,** 670–673 (1962) (in Russian).

Metalomonosovite (=beta-lomonosovite)
Ortholomonosovite (=lomonosovite)
Metamurmanite

E. I. SEMENOV, N. I. ORGANOVA AND M. V. KUKHARCHIK, New data on minerals of the group lomonosovite-murmanite. *Kristallografiya*, **6,** 925–932 (1961) (in Russian).

N. V. BELOV AND N. I. ORGANOVA, Crystal chemistry and mineralogy of the lomonosovite group in the light of the crystal structure of lomonosovite. *Geokhimiya* 1962, 6–14 (in Russian), translation in *Geochemistry* 1962, 4–13. (in part from abstracts by E. M. BONSHTEDT-KUPLETSKAYA in *Zapiski Vses. Mineralog. Obshch.*, **92,** 210–211 (1963)

For previous data on the lomonosovite-murmanite group, see *Am. Mineral.* **35,** 1092–1093 (1950)

Analyses 1–3 are of beta-lomonosovite, 1. by T. A. Burova, 2. by M. E. Kazakova (figure for H_2O corrected in abstract), 3. by M. V. Kukharchik, 4. meta-murmanite. by A. V. Bykova.

Beta-lomonosovite

The formula of beta-lomonosovite is given as

$Na_2Ti_2Si_2O_9\cdot(Na,H)_3PO_4$ (G. and K.)
$Na_5MnTi_3(Si_4P_2O_{21}(OH)_3)$ (S., O., and K)
$Na_2Ti_2^{3+}Si_2O_8\cdot NaH_2PO_4$ (B. and O.)
$Na_2Ti_2Si_2O_9\cdot NaPO_3$ (B. and O.)
(Lomonosovite is $Na_2Ti_2Si_2O_9+Na_3PO_4$)

As with lomonosovite, Na_3PO_4 is readily leached from the mineral by water.

The mineral occurs in tabular to platy masses up to 5×4×0.3 cm. Color pale yellow-brown, rose, brown. H about 4, brittle, G 2.98, 2.95. Luster vitreous to pearly on the cleavage, vitreous to greasy on fracture. Fracture uneven. Optically biaxial, (−), *ns* α 1.670, β 1.770, γ 1.779, 2V about 24° (G. and K.), 2V 10–20° (S., O., and K.), r>v. Extinction inclined with respect to the perfect cleavage.

	1	2	3	4
P_2O_5	18.54	16.12	15.05	5.00
SiO_2	24.60	25.18	24.18	29.53
Al_2O_3	—	0.69	0.40	1.00
Nb_2O_5	3.05	4.78	4.00	6.00
Ta_2O_5			0.52	
TiO_2	23.85	25.01	25.66	30.00
ZrO_2	2.24	1.89	2.50	2.10
Fe_2O_3	2.13	2.38	2.20	1.50
MgO	0.24	0.22	0.30	
MnO	0.96	1.40	1.70	2.20
CaO	1.66	0.62	1.80	1.00
Na_2O	16.50	17.13	15.16	10.50
K_2O	tr.	0.88	0.90	
H_2O	5.70	4.60	5.10	11.66
	99.47	100.90	100.10	100.04

Triclinic, a 5.28, b. 7.05, c 14.50 Å., α 102°24., β 96°51., γ 90°. The x-ray pattern (33 lines) has strong lines at 2.80, 2.77 (10), 3.50, 3.45 (9), —, 13.53 (8), 3.11 (5) or 3.03 (7) (by G. and K. and S., O., and K., resp.). The pattern is very close to that of lomonosovite.

DTA studies showed (G. and K.) a small endothermal effect at about 200°, a sharp exothermal effect at 650° and an endothermal effect at 900° (melting ?); (S., O., and K.) endothermal effects at 400° and 800° and a sharp exothermal effect at 650°.

Occurs in alkalic pegmatites of the Lovozero massif, Kola Peninsula, in poikilitic sodalite syenite and in eudialyte lujavrites. Associated minerals include microcline, aegirine, arfvedsonite, eudialyte, sodalite and nepheline.

The mineral is named beta-lomonosovite by G. and K. because it is considered to differ from lomonosovite, especially in water content and DTA behavior. The name metalomonosovite was given because the mineral was assumed to contain sodium metaphosphate, $NaPO_3$. Likewise, the name ortholomonosovite was suggested for lomonosovite to indicate the presence of sodium orthophosphate, Na_3PO_4.

Discussion.—Bonshtedt-Kupletskaya objects to the name metalomonosovite because the meta- prefix has been used most often to indicate a partially dehydrated phase, whereas metalomonosovite contains more water than lomonosovite. I agree. She also objects to the name ortholomonosovite as a bad name for a triclinic mineral. I agree; the name is unnecessary as well as objectionable.

Metamurmanite

Analysis 4 above is of a weathering product of beta-lomonosovite, which occurs in platy yellowish-gray and violet-gray masses. Biaxial, *ns* α 1.670, γ 1.730, 2V about 30°. The DTA curve shows endothermal breaks at 100°, 200°, 400° (small), and 800°. The *x*-ray pattern is close to that of beta-lomonosovite but contains fewer lines of lesser intensity. The analysis is interpreted as that of a member of the lomonosovite-murmanite group from which $NaPO_3$ has been leached.

Discussion.—I agree with Bonshtedt-Kupletskaya that this partially decomposed member of a poorly understood group should not be named.

Rijkeboerite

A. H. van der Veen. A study of pyrochlore. *Verhandel. Kon. Nederlands Geol. Mijnbouwkundig Genootschap, Geol. Ser.,* **22,** 1–188 (1963).

Chemical and *x*-ray fluorescence analysis gave BaO 4.85, SrO 0.09, CaO 0.47, PbO 0.90, Ce_2O_3 0.45, ThO_2 0.19, U_3O_8 1.68, Sb_2O_3 0.007, Bi_2O_3 0.03, Tl_2O 1.56, $Na_2O<0.5$, MnO 0.09, FeO (total Fe) 0.93, $MgO<0.1$, Ta_2O_5 71.59, Nb_2O_5 5.87, TiO_2 1.21, $ZrO_2<0.1$, SnO_2 2.05, Al_2O_3 0.42, $Li_2O<0.1$, As_2O_3 0.12, CuO 0.06, H_2O^+ (ign. loss) 6.9, SiO_2 1.2, Ag_2O 0.008, sum 100.675%. After deducting 3.68% microlite, 0.26 tantalite, 0.12% cassiterite, quartz and feldspar, this corresponds to $A_{0.35}\,B_2O_{5.32}\,(H_2O)_2$, where A = Ba (predominant), Fe, U, etc., B = Ta (predominant), Nb, Ti, Sn. The mineral is therefore a barium microlite, the analogue of pandaite (barium pyrochlore, with $Nb>Ta$, see *Am. Mineral.* **44,** 1324 (1959)) and with a large deficiency in the A group. The Tl reported is considered to have been adsorbed during separation using Clerici solution.

G 5.68–5.80, av. 5.71, calculated 5.60. Reflectivity in air 12.8–13.6, av. 13.2. Vickers hardness 485–498, av. 491 (= about $4\frac{1}{2}-5$). Heated material gives the *x*-ray pattern of $BaTa_4O_{11}$. Indexed *x*-ray powder data are given, the strongest lines are 3.034 (100) (222), 6.04 (80) (111), 3.18 (65) (311), 2.631 (60) (400), 1.865 (60) (440). $a = 10.570 \pm 0.0005$ Å.

The mineral was concentrated from alluvials (cassiterite-rich) from a pegmatite at Chi-Chico, São João del Rei, Minas Gerais, Brazil.

The name is for A. Rijkeboer, chief of analytical department, N. V. Hollandse Metallurgische Industrie Billiton, Arnhem, Netherlands, which made the analysis.

H. W. V. Willems

Vanuralite

Georges Branche, Pierre Bariand, Francis Chantret, Robert Pouget and Alexandre Rimsky, La vanuralite, nouveau minéral uranifère. *Acad. sci. (France), Comptes rendus,* **256,** 5374–5376 (1963)

Analyses gave UO_3 59.63, 58.45; V_2O_5 18.61, 18.06; Al_2O_3 5.30, 5.12; H_2O 16.20, 17.00; sum 99.74, 98.63%, corresponding to $Al_2O_3.2V_2O_5\cdot4UO_3\cdot17H_2O$ or $(UO_2)_2Al(VO_4)_2(OH)\cdot8H_2O$. A loss of weight curve shows a loss of about 10% to 250°, about 3.5% additional to 400° and about 2.5% from 400–450°. The DTA curve shows a double endothermal peak at about 170° and 220°, another at about 420°, and a smaller one about 800° perhaps corresponding to conversion of UO_2 to U_3O_8. There is an exothermic peak at 550°.

The mineral is monoclinic, in plates on (001). Forms identified are (001) (dominant), (101), $(\bar{1}01)$, (111), $(\bar{1}11)$ and (011). Cleavage (001), very easy. Single crystal study space group $A2/a$, unit cell a 10.44, b 8.56, c 20.35 Å, β 103°; the unit cell contains $(UO_2)_8Al_4(VO_4)_8(OH)_4 \cdot 32H_2O$. *X*-ray powder data (Co K_α) are given (10 lines); the strongest lines are 9.96 (90), 5.00 (80), 3.326 (30), 2.679 (25), 2.490 (18).

Vanuralite is citron-yellow. Hardness about 2, G (by hydrostatic suppension) 3.62. Optically biaxial (−), with *ns* α 1.65, β 1.85, γ 1.90, 2V measured 44°, calculated 46°, dispersion weak $r<v$. Orientation $Z=b$, X nearly parallel to c, Y nearly parallel to a. Pleochroism strong, X colorless, Y and Z yellow.

The mineral occurs in a supergene deposit at Mounana, Gabon, with plumboan francevillite (predominant), chervetite and brackebuschite.

The name is for the composition.

Chervetite

P. BARIAND, F. CHANTRET, R. POUGET AND A. RIMSKY, Une nouvell espèce minérale: la chervetite, pyrovanadate de plomb $Pb_2V_2O_7$. *Bull. Soc. Franc. Mineral Crist.* **86,** 117–120 (1963)

Chemical analysis of the mineral by R. P. gave V_2O_5 33.02, PbO 67.05, sum 100.07%, by electron probe V_2O_5 29.1, PbO 71.6, sum 100.7%, corresponding to $Pb_2V_2O_7$. Spectrographic and qualitative tests showed no other elements. The mineral gives the same *x*-ray pattern as the compound $Pb_2V_2O_7$ synthesized by adding lead acetate solution to solutions of sodium pyrovanadate at pH 7 or of sodium metavanadate at pH 4.5.

The mineral occurs in nearly colorless crystals from less than a mm to several cm always twinned (100), also as pseudomorphs after francevillite. Prominent faces are (100), (221), $(2\bar{2}1)$, (001), also observed 16 others. *X*-ray study shows space group $P2_1/a$, a 13.47$_0$, b 7.32$_6$, c 6.95$_6$ Å, β 107°25′, Z=4. An indexed *x*-ray powder pattern is given (25 lines): the strongest lines are 3.424 (100) $(20\bar{2})$; 2.976 (53) (410), 3.204 (44) (021), 3.076 (38) $(21\bar{2})$, 3.570 (32) (211), 4.844 (30) (210). Cleavages (100) and (010) doubtful.

Colorless to gray to brown, streak white, luster adamantine. G 6.30–6.32. H less than 3. Biaxial, (−), 2V 65–75°, *ns* between 2.2 and 2.6, birefringence 0.279±0.03. Dispersion inclined, weak.

The mineral occurs, associated with francevillite and more rarely with wulfenite in the zone of oxidation of the Mounana uranium mine, Dept. Haut-Ogooue, Republic of Gabon.

The name is for Jean Chervet, French mineralogist.

Jimboite

T. WATANABE, A. KATO, T. MATSUMOTO AND J. ITO, Jimboite, $Mn_3(BO_3)_2$, a new mineral from the Kaso Mine, Tochigi Prefecture, Japan. *Proc. Japan. Acad.* **39,** 170–175 (1963)

Chemical analysis gave B_2O_3 18.6, CO_2 6.1, SiO_2 3.3, MnO 65.3, MgO 3.3, FeO 1.6, CaO 0.5, Al_2O_3 0.1, H_2O 0.1, insol. 1.4, sum 100.3%. After deducting rhodochrosite and tephroite, this corresponds to $(Mn_{2.67}Mg_{0.23}Fe_{0.06})_{2.96}B_{2.02}O_{6.00}$, the Mn analogue of kotoite. The mineral is soluble in HCl, HNO_3 and H_2SO_4.

Weissenberg study on a cleavage piece showed the mineral to be orthorhombic, space group D^{12}_{2h} or C^{10}_{2V}, the former being preferred because of the absence of a piezoelectric effect. From the *x*-ray powder data, the unit cell constants are a 5.640, b 8.715, c 4.637, Z=2. Material synthesized by heating $MnCO_3$, B_2O_3, and KHF_2 at 700° C. for 30 minutes gave a 5.672, b 8.744, c 4.661° Å. The strongest lines of the powder pattern are 2.33 (100) (211), 2.77 (90) (121), 4.09 (70) (011), 1.580 (70) (330), 3.59 (60) (101), 2.59 (50) (130), 1.791 (50) (202).

Jimboite is light purplish brown with vitreous luster. H $5\frac{1}{2}$ G 3.98 (meas. pycnometer), 4.09 (calc. from *x*-ray). Cleavage $\{110\}$ perfect, parting $\{101\}$. Twin plane and composition plane $\{101\}$; glide-twinning is sometimes observed. Under the microscope nearly colorless. Optically biaxial, (+), *ns* α 1.792, β 1.794, γ 1.821, 2V 35°, $r>v$, $Y=b$, $X=a$, optical plane parallel to $\{010\}$.

The mineral occurs in banded carbonate ores of the 18th level of the Kaso Mine, Kanuma city, Tochigi Prefecture, Japan, associated with rhodochrosite, galaxite, jacobsite, tephroite, alabandite, galena, pyrrhotite and chalcopyrite. It was probably formed by metasomatic reaction of B_2O_3 with rhodochrosite.

The name is for the late Professor Kotora Jimbo, founder of the Mineralogical Institute University of Tokyo.

Kenzo Yagi

Iranite

P. Bariand and P. Herpin, Une nouvell espèce minérale: l'iranite chromate hydraté de plomb. *Bull. Soc. Franc. Mineral. Crist.* **86,** 133–135 (1963)

Analysis by microprobe gave PbO 66.2, CrO_3 28.8, H_2O (by difference) 5, sum 100%; corresponding to $PbCrO_4 \cdot H_2O$. Spectrographic and microchemical tests showed no other elements and no CO_2 or H_2O was found. The mineral is soluble in warm Na_2CO_3 solution.

Crystals are less than 0.5 mm long. Goniometric data are given, leading to $a:b:c = 1.08:1:1.06$, α 105°, β 66°, γ 109°. Forms observed are $(\bar{1}00)$, (010), (011) (most prominent), and $(\bar{1}0\bar{1})$, $(00\bar{1})$, $(10\bar{2})$. Weissenberg photographs show the mineral to be triclinic. with *a* 10.02±0.02, *b* 9.54±0.02, *c* 9.89±0.02 Å, α 104°30′, β 66°, γ 108°30′, $a:b:c = 1.05:1:1.04$, Z=8. G calc. = 5.8. Indexed *x*-ray powder data are given (28 lines); the strongest are 3.60 (10), 3.49 (10), 3.28 (10), 3.18 (10), 3.08 (10), 4.84 (8), 4.42 (8), 3.44 (8), 3.39 (8).

Optically biaxial, sign not given, 2V very large. One index of refraction was approximately 2.25–2.30, another 2.40–2.50. Extinction 5° to the elongation. Pleochroism on (100) brownish-orange along the elongation, yellow-orange perpendicular to the elongation.

The mineral is saffron-yellow, luster vitreous. It occurs in very small amount at the ancient Sebarz Mine, northeast of Anarak, central Iran. It is associated with dioptase, fornacite and another lead chromate.

The name is for the country.

Wodginite

E. H. Nickel, J. F. Rowland and R. C. McAdam, Wodginite—a new tin-manganese tantalate from Wodgina, Australia, and Bernic Lake, Manitoba. *Canad. Mineral.* **7,** 390–402 (1963)

The mineral from Manitoba occurs as small, black grains varying from less than one millimeter to about ten millimeters in diameter. Some of the grains are sphenoidal and others are irregular. The grains contain numerous inclusions of feldspar and/or mica. The wodginite occurs in a complex zoned pegmatite. It is found in coarse, partially sericitized perthitic microcline and in fine-grained bluish-white aplitic albite. The following additional minerals have been found in the pegmatite: quartz, lithium micas, spodumene, pollucite, amblygonite, beryl, lithiophilite, apatite, tourmaline, rhodochrosite, tantalite, tapiolite, cassiterite and microlite. The Australian wodginite, originally described as ixiolite by Simpson in 1909 (*Australian Assoc. Adv. Sci.* **12,** 310–315), proved to be identical with the Bernic Lake material. Simpson's mineral occurs as roughly tabular grains, some of which form partially radiating groups. It is found in a matrix of granular albite, quartz and muscovite.

Wodginite from both localities varies from reddish brown through dark brown to almost black. Small splinters are translucent in transmitted light and have a color range from light yellow to reddish brown. In polished section, wodginite is very similar to columbite-tantalite. The specific gravity of the Wodgina mineral was reported as 7.36 by Simpson. The Bernic Lake wodginite has a specific gravity of 7.19 (by pycnometer on concentrate prepared for analysis).

Chemical analysis of an unspecified amount of the Bernic Lake wodginite (R. C. McAdam, analyst) gave: Ta_2O_5 70.05, Nb_2O_5 1.35, SnO_2 13.20, MnO 9.04, FeO 1.87, TiO_2 2.39 and SiO_2 0.60; total 98.50%. The silica is probably due to admixed muscovite. The low summation is considered to be a result of the fact that certain constituents could not be determined and the possibility that some of the cations might be present in a higher oxidation state. The analysis of the Wodgina mineral as given by Simpson is: Ta_2O_5 70.49, Nb_2O_5 7.63, SnO_2 8.92, MnO 10.87, FeO 1.34, CaO 0.42, MgO 0.37, loss on ignition 0.18; total 100.22%. Calculated specific gravities are: Wodgina 7.69 and Bernic Lake 7.81. These are significantly higher than the measured values and may reflect a higher oxidation state for some of the cations (Mn and Fe).

Single crystal data from a cleavage fragment of the Wodgina mineral showed that wodginite is monoclinic with a space group of $C2/c$ or Cc. Unit cell parameters are: $a=9.52$, $b=11.46$, $c=5.11$Å; $\beta=91°15'$; cell volume$=557.4$ Å^3. Similar data calculated from the powder data are recorded for the Bernic Lake material. The cell parameters of wodginite (W) are related to those of the columbite-tantalite series (CT) as follows: $a_W \equiv 2/3 b_{CT}$, $b_W \equiv 2a_{CT}$, $c_W \equiv c_{CT}$, and $\beta_W \equiv \beta_{CT}$. Thus, the cell volume of wodginite is 4/3 that of columbite-tantalite. The wodginite analyses were recalculated to atomic proportions for a cell containing 32 oxygens (4/3 of the oxygens in the columbite-tantalite cell). The resulting formulae are: Wodgina, $(Ta, Nb, Sn, Mn, Fe)_{15.78}O_{32}$; Bernic Lake, $(Ta, Nb, Sn, Mn, Fe, Ti)_{15.85}O_{32}$. Tin is not considered an essential constituent of wodginite. A tin-free synthetic phase and a "manganotantalite" (0.30% SnO_2) from the Benson Mine, Southern Rhodesia both give wodginite-type powder patterns.

Strongest lines (in Å) in the indexed powder pattern for the Wodgina material (Fe-filtered, Co radiation) are: 3.00 (100), 3.67 (70), 2.95 (70), 2.50 (29), 1.774 (27), 2.87 (25), and 2.55 (21). The powder patterns are very similar to those of the columbite-tantalite series. The most obvious difference is the strong doublet at 2.95–3.00 Å for wodginite instead of a strong single line for columbite-tantalite.

The name is for the Australian locality.

Discussion.—As the authors state, it will be interesting to see how many columbite and tantalite specimens are really wodginite.

J. A. Mandarino

Unnamed (sodium fluoride-phosphate)

M. D. Dorfman, Mineralogy of pegmatites in the zone of weathering in ijolite-urtites of Yukspor Mt., Khibina Massif. *Akad. Nauk SSSR, Kol'sk Filial* 1962, 74–75 (in Russian).

The mineral occurs as colorless clear grains cementing villiaumite (NaF) in veinlets 1–15 mm in coarse-grained microcline-aegirine-nepheline pegmatite. Luster vitreous. H 2–2.5, isotropic with n 1.460, fracture conchoidal to uneven. Very soluble in water and replaced by white powdery sodium carbonate.

Spectrographic analysis showed Na, P- very strong; Ca medium; Si, Fe, Al, Sr—weak; Mn, Ti, Cu—faint. Semiquantitative chemical determinations by E. I. Uspenskaya showed $P_2O_5 > 10\%$, F not less than 4%.

An x-ray powder pattern is given (22 lines), of which 12 are close to lines given for

Na_2CO_3. The strongest remaining lines are 4.98 (10), 4.01 (10), 2.45 (9), 3.09 (9), 3.76 (7), 8.16 (5), 6.28 (5).

Unnamed Minerals from Meteorites

Paul Ramdohr, The opaque minerals in stony meteorites. *Jour. Geophys. Ressearch* **68,** 2011–2036 (1963)

The following are briefly mentioned:

$(Ni, Fe)_xSi_y$, Believed to contain some P. Isotropic, resembles kamacite, but its reflectivity is slightly lower. Extremely brittle. Perfect octahedral cleavage.

A new Fe-C-S mineral. Extremely low hardness, considerably less than that of graphite. Found only in carbonaceous chondrites. Properties variable. Reflectivity less than that of vallerite. $E > O$.

A new Fe-Mg-Mn-Ca sulfide. Similar to oldhamite, but has much higher reflectivity and is much less readily attacked by water. Cleavage cubic, perfect.

Eleven other apparently new minerals are listed and optical data are given, but no chemistry.

Wurtzite-9R, Wurtzite-12R, Wurtzite-21R

Siegfried Haussühl and German Muller, Neues Zn-S-Polytypen (9R, 12R, und 21R) in mesozoischen Sedimenten NW-Deutschlands. *Beitr. Mineral. Petrog.* **9,** 28–39 (1963).

Sphalerite and 7 wurtzite polytypes (3 new) are described. This brings the number of wurtzite polytypes to nine.

Molybdenite-3R

R. J. Traill. A rhombohedral polytype of molybdenite, *Canad. Mineral.*, **7,** 524–526 (1963).

Rhombohedral molybdenite (3R) has been found in quartz-feldspar porphyry at the Con Mine, Yellowknife, District of Mackenzie, Northwest Territories, Canada.

The *x*-ray powder pattern of rhombohedral molybdenite has distinct differences from that of the normal (2H) mineral. The main differences are the absence of the $(10\bar{1}2)$ reflection and the presence of strong doublets at the normal positions of the $(10\bar{1}3)$ and $(10\bar{1}5)$ reflections. These same differences have been noted for synthetic rhombohedral molybdenite. The natural material has space group *R3m*, $a = 3.16$ and $c = 18.33$ Å.

J. A. Mandarino

NEW DATA

Denningite

J. A. Mandarino, S. J. Williams and R. S. Mitchell, Denningite, a new tellurite mineral from Moctezuma, Sonora, Mexico, *Canad. Mineral.* **7,** 443–452 (1963).

A preliminary description was abstracted in *Am. Mineral.* **47,** 1484 (1962). The following additional data are given. Cleavage $\{001\}$ perfect, fracture conchoidal. Darkens and fuses easily in a flame, fuses quietly to a brown material in the closed tube, to a reddish-brown material in the open tube. Dissolves easily in cold HCl, giving a yellow solution. Insoluble in hot or cold HNO_3, slightly soluble in H_2SO_4 with separation of white milky material.

Lodochnikite, Absite, Thorutite

M. M. Povilaitis, On the new mineral lodochnikite, absite, and thorutite. *Zapiski Vses. Mineralog. Obshch.* **92,** 113–123 (1963).

This is a review of the physical and chemical properties of the brannerite group, with recalculation of 24 chemical analyses. It is considered that brannerite (ideally UTi_2O_6) and thorutite (see *Am. Mineral.* **43,** 1007 (1958)) (ideally $ThTi_2O_6$) form a complete series of solid solutions. (The analyses show a gap from $Th_{0.21}$ to $Th_{0.87}$ M.F.). Lodochnikite (see *Am. Mineral.* **43,** 380 and 1007 (1958)) and absite (see *Am. Mineral.* **41,** 166 (1956)) are brannerite.

Lombaardite (=Allanite?)

Henrich Neumann and Borghild Nilssen, Lombaardite, a rare earth silicate, identical with, or very closely related to allanite. *Norsk. Geol. Tidsskrift* **42,** 277–286 (1962).

Lombaardite was described from the Transvaal (see *Am. Mineral.* **36,** 381 (1951) as $Ca_{10}(Fe, Mg)_5Al_{27}Si_{18}O_{89}(OH)_5$. It has now been bound in pegmatite at Åskagen, Värmland, Sweden, associated with thalenite. Analysis by B. Bruun (a little calcite and feldspar present) gave SiO_2 32.35, TiO_2 0.02, Al_2O_3 19.69, Fe_2O_3 2.60, FeO 8.60, MgO 0.47, MnO 0.72, CaO 9.44, rare earths 22.16, Na_2O 0.11, K_2O 0.47, H_2O^+ 2.37, H_2O^- 0.31, F 0.22, CO_2 0.63, sum 100.14 − (0.09) = 100.05%. X-ray spectrographic analysis of the rare earths gave Ce_2O_3 4.8, Pr_2O_3 3.1, Nd_2O_3 25.9, Sm_2O_3 18.6, Gd_2O_3 12.7, Tb_2O_3 1.5, Dy_2O_3 6.5, Er_2O_3 1.3, Yb_2O_3 1.8, Y_2O_3 24.5, sum 100.7%. A dehydration curve shows that 1.2% H_2O is lost below 460°.

The analysis of the Åskagen material differs from that of the type material mainly in the rare earths (not reported in the Transvaal material), the much lower Al_2O_3 (19.96 vs. 35.85), and lower CaO (9.44 *vs.* 15.36%). Spectrographic analysis of the Transvaal material (on 13 mg) showed 10–15% rare earths.

The two samples gave identical *x*-ray powder patterns which are very similar to that of epidote, and the analysis gives the formula $(RE, Ca)_{11}(Fe, Mg, Mn)_5(Al, Fe)_{14}Si_{18}O_{72}(OH)_6$. It seems probable that lombaardite is an allanite, but the type material needs to be studied further.

Classification of the pyrochlore group

A. H. van der Veen. A study of pyrochlore: *Verhandel. Kon. Nederlands Geol. Mijnbouwkundig Genootschap. Geol. Ser.* **22,** 1–188 (1963).

A new classification is proposed, based on new data and a compilation of 107 analyses. The general formula of the group is AyB_2X_{7-x}, where $o<y<2$, and $o<z<1$ (perhaps <2). According to the predominant B ion, the 3 groups recognized are microlite (Ta), pyrochlore (Nb), titanopyrochlore (Ti). The following species are recognized (predominant A group element given): Ta; microlite (Na+Ca), tantalobetafite (>15% U), tantalo-obruchevite (Y), rijkeboerite (Ba), plumboan microlite (Pb); Nb; pyrochlore (Na+Ca), betafite (>15% U), obruchevite (Y), pandiate (Ba); Ti; titanopyrochlore (Na+Ca), titanobetafite (>15% U), titanoobruchevite (Ti). A long list of names considered superfluous is given; most of these had been previously noted by others as synonyms.

H. W. V. Willems

Hydrohausmannite (a mixture?)

W. Feitknecht, P. Brunner and H. R. Oswald, Über den Einfluss der Feuchtigkeit auf die Oxydation von Manganhydroxid durch molecularen Sauerstoff. *Zeit. anorg. allgem. Chem.* **316,** 154–160 (1962)

Hydrohausmannite was first made by Feitknecht and Marti, *Helv. Chim. Acta,* **28,** 129 (1945); the name was applied to natural material by Frondel, *Am. Mineral.* **38,** 761–769 (1953). Both the synthetic and natural material were hydrated and gave *x*-ray patterns close to that of hausmannite but with an extra very strong line at 4.65 Å.

Feitknecht and co-workers have now re-studied the oxidation of $Mn(OH)_2$ and find by *x*-ray and electron microscope study that the product previously called hydrohausmannite is a mixture of hausmannite with beta-MnO(OH), which on further treatment changes to gamma-MnO(OH). Natural material was not studied.

DISCUSSION.—Hydrohetaerolite should also be re-examined.

DISCREDITED SPECIES

Selenjoseite (=Laitakarite)

L. G. BERRY, The probable identity of laitakarite and selenjoseite. *Canad. Mineral.* **7,** 677–679 (1963).

The data given for laitakarite (see *Am. Mineral.*, **47,** 806–807 (1962)) are shown to be essentially the same as those for selenjoseite given by Berry and Thompson, *Geol. Soc. Am. Mem.* **85,** 29 (1962). Since the name laitakarite is based on fully described material, it is suggested that "selenjoseite" be dropped.

J. A. MANDARINO

Hanléite (=Uvarovite)

G. G. K. SASTRI, Note on a chrome and two manganese garnets from India. *Mineral. Mag.* **33,** 508–511 (1963).

Hanléite, described by Fermor in 1952 (see *Am. Mineral.* **37,** 1071 (1952)) as a magnesium-iron-chromium garnet has been re-studied. Partial analysis (by A. Purushottam) gave: Cr_2O_3 27.26% and "an appreciable percentage of calcium qualitatively." The Cr_2O_3 content corresponds to 89.7% uvarovite. The physical data ($n = 1.840 \pm 0.005$ and $a = 11.999 \pm 0.005$ Å) are close to those of synthetic uvarovite. Thus, hanléite is considered to be identical to uvarovite.

J. A. MANDARINO

Phosphochromite (=Ferrian Variscite)
Elroquite (=mixture of quartz and ferrian variscite)

J. L. JAMBOR. Elroquite and phosphochromite discredited. *Canad. Mineral.*, **7,** 676–677 (1963).

X-ray and chemical data prove that phosphochromite, originally described as a chromium phosphate, is ferrian variscite. Similarly, elroquite, a supposed "hydro-silicate of Al_2O_3 and Fe_2O_3," is a mixture of quartz and ferrian variscite. Specimens used for the original description by Shepard in 1877 were investigated.

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