NOTES AND NEWS

MINERAL OCCURRENCES IN WESTERN CANADA

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These notes describing some of the rarer ore minerals found during mineralographic studies, continue the series, the last of which appeared in *Am. Mineral.*, **36,** 504, 1951. I am pleased to acknowledge the assistance of Dr. H. V. Warren, A. R. Bullis, E. D. Dodson, J. A. Soles, and J. G. Souther, in collecting and/or examining ores.

Argyrodite. Ag_8GeS_6. Dolly Varden Mine, Alice Arm, Skeena M.D., B. C. This mine is located near the headwaters of the Kitsault River, 18 miles from the head of Alice Arm which extends northeasterly from Observatory Inlet. The mine has been inoperative for the past thirteen years but was well known during its brief history for its high silver values. A detailed discussion of the geology and mineralogy is given by Warren and Brown (*Trans. C.I.M.M.*, **45**, 1942, pp. 497–510).

The present discovery stems from a re-examination of some rich ore specimens by Mr. J. A. Soles, one of the writer's students in the course in mineralography. The samples examined consist of rather glassy bluish-black vuggy quartz containing pyrite and argentite. The ore minerals recognized under the microscope in approximate order of their abundance are: pyrite, argentite, galena, sphalerite, pyrargyrite, silver, chalcopyrite, tetrahedrite, polybasite, and argyrodite. The argyrodite was first thought to be tetrahedrite but it gave negative microchemical tests for copper. It was positively identified by comparing its *x*-ray powder pattern with that of argyrodite from type localities. The mineral has been found only in small amount in polished sections of ore from the 252 stope where it occurs with argentite in veinlets and fissures and appears to be closely associated with pyrite because it has not been observed in the more massive areas of argentite away from the strongly pyritized quartz. Until further work is done no generalizations as to its occurrence are warranted. It is interesting to note that silver minerals are associated with argyrodite at the type localities for this mineral, namely Saxony and Bolivia. In view of the present demand for germanium it would appear that silver deposits are good indicators of this element and should be closely studied. The writer has noted germanium in small amounts in spectrographic plates of coal ash, several sulphides, particularly sphalerite, and a few silicates, but can find no mention of a mineral containing essential germanium in North America.

Enargite. Cu_3AsS_4. Copper Mountain, near Castle Mountain Station on the Canadian Pacific Railway, Alberta. Copper Mountain is situated

opposite the south end of Castle Mountain (now Eisenhower) across the Bow River. The area was prospected in 1884 and is described by Dawson (*Geol. Surv., Canada Ann. Report*, **135B,** 1886). Copper minerals are said to occur in quartz seams and lenses in Cambrian limestone.

The writer is indebted to Dr. W. H. Mathews for a specimen from this area. The small hand specimen examined consists of granular quartz stained with azurite and malachite and containing a 1 cm. patch of enargite on one corner. The mineral shows the typical cleavage and its identity was confirmed by an *x*-ray powder photograph. This occurrence is of interest as enargite has not been recorded previously in Canada.

In the University collections a sample labelled copper ore from Clearwater River east of Fort McMurray, Alberta, was found to be a solid cleavable mass of enargite with minor amounts of calcite and alteration rims of malachite. Unfortunately no information regarding its exact location or geological setting could be obtained.

Fergusonite. (Y, Er, Ce, Fe) (Cb, Ta, Ti)O_4. Tryagain Claim, Lemon Creek, Slocan M.D., B.C. Mr. D. Bain submitted a sample to the B. C. and Yukon Chamber of Mines for identification from his property located $2\frac{1}{4}$ miles above the Lemon Creek bridge on the Nelson-Nakusp highway. The sample, subsequently turned over to the writer, consists of a $1\frac{1}{2}\times1\frac{1}{2}\times\frac{1}{4}$ inch mass of a brownish-black mineral with a subconchoidal fracture and a highly vitreous lustre. The hardness is 6 and the specific gravity 5.71. The mineral contains a small amount of admixed red feldspar. The mineral is in the metamict state but on ignition the structure was restored and an *x*-ray powder pattern in exact agreement with that of ignited fergusonite from Ytterby, Sweden, was obtained. The mineral gives a positive blowpipe test for uranium.

Lang (*Geol. Surv., Canada.* Paper 51-10, 46, 1951) reported allanite from the above locality. The only other known fergusonite locality in British Columbia is an occurrence 15 miles east of Kelowna (Lang, 46, 1951).

Gersdorffite. NiAsS. Mastodon Mine, near Revelstoke, Revelstoke M.D., B.C. Cubo-octahedral crystals of gersdorffite embedded in a groundmass of sphalerite and galena were observed in recent specimens received from this mine. The crystals are about $\frac{1}{2}$ mm. in size and give positive microchemical tests for nickel and arsenic but negative tests for cobalt. Their identity was confirmed by an *x*-ray powder photograph. Although cobaltite is a fairly common accessory mineral in several B. C. ores, the nickel analogue has not been recorded previously.

Matildite. $AgBiS_2$. How Group, Camsell River, N.W.T. The How Group is a part of the Camsell River Silver Mines' property and is located on the Camsell River about 20 miles south of Great Bear Lake.

The property is described by Kidd (*Geol. Surv., Canada* Memoir **187,** p. 33, 1936).

Dr. C. Riley, who was in charge of the development work on the property in 1935, kindly donated specimens which consist of a dolomite-quartz gangue with disseminated galena, chalcopyrite, pyrite, bismuth, and bismuthinite. Kidd (1936) noted that the bismuthinite was unusual in that it carried considerable silver.

One of the more interesting microscopic features of this ore is the fairly abundant galena-matildite exsolution intergrowth which exhibits a Widmanstätten texture. This intergrowth appears to be responsible for the majority of the silver content of the ore. Bismuthinite, usually contacting bismuth, occurs in small amounts. Associated with the above are sphalerite, chalcopyrite, traces of tetrahedrite, silver, argentite, marcasite, and minute zoned crystals of an undetermined iron cobalt nickel arsenic sulphide.

Owyheeite. $5PbS \cdot Ag_2S \cdot 3Sb_2S_3$. Rossland Mines Limited, near Rossland, Trail Creek M.D., B. C. Current development work on the Bluebird-Mayflower workings by Rossland Mines Limited makes a study of these ores of particular interest at the present time. The two workings are about 1000 feet apart on opposite sides of Gopher Creek, and are about $1\frac{1}{2}$ miles south of Rossland. A recent outline of the geology and development work is given by White (*Minist. of Mines B. C.*, Ann. Rept., 1949, 158).

A detailed mineralographic study of this ore was undertaken with a view to determining the nature and association of the silver, gold, lead, and zinc values. The several samples studied consist of a massive complex of sulphides and sulfosalts including pyrite, arsenopyrite, pyrrhotite, sphalerite, galena, and boulangerite as major constituents and minor amounts of tetrahedrite, owyheeite, meneghinite, chalcopyrite, and gold. Of particular interest is the occurrence of the owyheeite which appears to carry the main silver values. A fibrous, radiating, or interlocking mosaic of boulangerite crystals forms the groundmass of much of the ore. This encloses grains of pyrite, pyrrhotite, arsenopyrite, sphalerite, and galena either evenly disseminated or in irregular aggregates or crude bands.

Owyheeite, only recognizable under the microscope, is always intergrown with boulangerite, and under plane light the two minerals are difficult to distinguish. The owyheeite is slightly harder and less gray than the boulangerite. It has a rather yellowish cast. The yellow, blue, and purple polarization colours differ sufficiently from those of boulangerite to distinguish the two minerals under crossed nicols. The most satisfactory method of distinguishing these two minerals proved to be a 10 second etch with 1:1 HNO_3. The boulangerite is completely black-

ened in this time while the owyheeite is only slightly etched.

The galena contains laths of a slightly greenish-gray anisotropic mineral which proved to be meneghinite.

Owyheeite was first identified in two B. C. ores in 1948, and has since been reported from two other localities in British Columbia. In the absence of appreciable amounts of tetrahedrite or silver minerals, any silver bearing "jamesonite" should be regarded with suspicion.

Stannite. Cu_2FeSnS_4. Crowfoot Property, Magna Bay, Shuswap Lake, Kamloops M.D., B. C. Mr. S. Larder of Salmon Arm, B. C., submitted a suite of samples reputed to contain values in tin. Patches of stannite up to 1 cm. in size may be seen in a groundlmass of galena, sphalerite, pyrite, minor chalcopyrite and vuggy white quartz. Tin has not been reported previously in this area.

Tellurbismuth. Bi_2Te_3. Lucky Jim, Quadra Island, Nanaimo M.D., B. C. The presence of sylvanite at this property was suggested several years ago (*Minist. of Mines B. C.*, Ann. Rept., 1913, 286). Mr. J. Easton recently donated a sample of white quartz showing small platy masses of tellurbismuth intimately associated with gold.

Tetradymite. Bi_2TeS_2. Katanga Group, Pitt Lake, New Westminster M.D., B. C. This property is situated on the east side of Pitt Lake near the mouth of Scott Creek. The mineralization is reported to consist of pyrite and chalcopyrite which occurs in veins or dikes of a fine grained feldspathic rock up to 20 feet in width (*Minist. of Mines, B. C.*, Ann. Rept., 1930, 313).

Samples collected by Mr. G. A. Dirom consist mainly of massive arsenopyrite and minor chalocpyrite while one specimen shows coarse platy masses of tetradymite embedded in a groundmass of quartz, green diopside, and scheelite. This interesting association is evidently not typical of the mineralization.

Tetrahedrite (mercurian). $(Cu. Hg, Zn, Fe)_{12}(Sb, As)_4S_{13}$. Red Rock Group (formerly Brenda, *Minist. of Mines, B. C.*, Ann Rept., 1922, 187), near Skookumchuck, Fort Steele M.D., B. C. This property is situated on a small tributary of Skookumchuck Creek called Copper Creek about 6 miles west of Torrent Station. Samples reputedly from this property were presented to Dr. H. V. Warren through the kindness of Mr. N. Moe and consist of masses of tetrahedrite with minor pyrite in a quartz-siderite gangue. On close inspection of the material in the field, Dr. Warren noticed a few small red crystals in crevices and vugs in the tetrahedrite, and which were later identified in the laboratory as cinnabar.

A chemical analysis of the tetrahedrite was made by Mr. R. N. Williams on a sample with an average specific gravity of 4.95 and a cube edge of 10.3 A. A polished section of a portion of the material used for the analysis showed no impurities. The analysis is given on next page.

Cu	36.62
Hg	4.94
Zn	4.50
Fe	4.00
Sb	24.42
As	0.35
S	25.04
	99.87

A previous occurrence of mercurian tetrahedrite in British Columbia was described by Warren & Lord (*Econ. Geol.*, **30**, 67, 1935) from the Pretty Girl Claim of North Kootenay Mines Ltd., about 40 miles to the northwest of the Red Rock Group.

Wehrlite. Bi_2Te_3. Jones Creek, New Westminster M. D., B. C. This property variously known as the Laidlaw Group, Sovereign, and Telluride Gold Property, is situated a short distance above the Jones Creek bridge on the main highway about 12 miles west of Hope. Samples submitted from time to time consist of massive gold bearing arsenopyrite in quartz. Small quantities of wehrlite intimately associated with gold are occasionally seen embedded in quartz.

Monty Claim, Douglas Group, Clinton M.D., B. C. This claim is situated near the head of the North Fork of Watson Bar Creek. Highly weathered narrow quartz veins which contain less than two percent of oxidized pyrite show occasional small clean flakes of wehrlite. Crushed material yields numerous fine gold particles. Wehrlite was identified on a neighbouring claim (Ajax) in 1949.

AN OCCURRENCE OF URANINITE IN A BLACK SAND[1]

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A sample of radioactive black sand reputedly taken from a placer deposit in British Columbia and submitted to the Geological Survey of Canada has been found to contain small amounts of uraninite. This occurrence is considered noteworthy because it is, so far as the writer has been able to learn, the first unquestionable identification of uraninite as a detrital mineral.

The sample submitted for examination is composed of the following minerals, listed in the order of their apparent abundance: magnetite (about 60 per cent by weight), hematite, garnet, chromite, pyrite, pyroxene, epidote, monazite, scheelite, native platinum, uraninite, cinnabar, and native gold.

[1] Published by permission of the Director-General of Scientific Services, Department of Mines and Technical Surveys, Ottawa.

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