You dont have much to say
about mineralogy. You say no
covellite. Are not both covellite &
chalcocite present. I found gold with
only 1/2 hour search ore

MINERALOGY OF THE NUMBER FIVE MINE

BRITANNIA, B. C.

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FIFTH YEAR

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TABLE OF CONTENTS

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Location and Access

The property of the Britannia Mining and Smelting Company Limited is located on the east side of Howe Sound, about thirty miles from Vancouver. Howe Sound is navigable for its full length, and thus Britannia is well served by Coastwise shipping. Squamish, the Southern terminus of the Pacific Great Eastern Railway is located six miles further north at the head of Howe Sound.

History of Development

The first discovery of copper at Britannia was made in 1888 by Forbes, but no further prospecting took place until Oliver Furry staked his five claims in 1898. In 1900 the Britannia Copper Syndicate was formed, and in 1908 the Britannia Mining and Smelting Company was organized as a subsidiary of the Howe Sound Company. From 1904 to 1935 Britannia has produced 500,000,000 pounds of copper, 225,000 ounces of gold, 2,700,000 ounces of silver, about 31,300,000 pounds of zinc, and 312,000 pounds of pyrite. In addition 6,500,000 pounds of copper have been precipitated from the mine water with the aid of scrap iron. In the past three orfour years the production of gold has risen sharply due mainly to the discovery of the No. 5 ore body.

Climate and Topography

The climate of the area in general is moderate, but in detail it is varied due to large differences in elevation. For example, snow seldom falls at Britannia Beach, but at the Townsite, 2000 feet higher in elevation snow remains for the best part of the winter several feet deep.

As is implied the topography is rugged, and thus is typical of the Coast Range. The valleys are deeply incised.

Previous Work

Although a good deal of work has been done on the ore bodys at Britannia, no intensive study of the No. 5 ore body has been made. The writer is greatly indebted to Doctor H. V. Warren and the staff of the Department of Geology at U. B. C. for their great assistance and encouragement in the preparation of this report.

General Geology

The Britannia ore body is located in what is believed to be a Triassic roof pendant in the Jura-Cretaceous Coast Range intrusion. The pendant, similar to any one of a number of such bodies found along the Coast, consists of a highly metamorphosed assemblage of old volcanic and sedimentary formations that once covered the surface of the batholith. Extensive erosion has removed the main part of these formations and left remnants dotted here and there along the length of the Range.

The Britannia Pendant covers an area of about thirteen square miles, strikes roughly East-West, and dips at 70°S. LeRoy[1] called the rocks in the pendant the Britannia Formation, and described them as being tuffs, quartzites, agglomerates, pyroclastics, dark carbonaceous shales and greenstone. The rocks have been deformed and tilted by shearing movements and metamorphosed by the action of heated solutions eminating from the underlying batholith. Estimates as to the thickness of the formation vary, but on the average it is agreed that 6000 feet is the probable depth of the pendant.

The Britannia shear zone is the most important feature from an economic point of view, for it is in, or close to, this zone that all the commercial ore deposits occur. The shear zone strikes more or less parallel to the long axis of the pendant and dips at the same angle, namely 70°S. It is over five miles long extending from Jane creek just above the Townsite, Eastwards to the Seymour creek forks. Its maximum width is about 2000 feet. The bulk of the ore deposits so far discovered lie in the western portion of the shear zone.

The No. 5 ore body is the most recent discovery on the property. It was found during the summer of 1937 while

[1]LeRoy, O. E. - Preliminary Report on a Portion of the Main Coast of B.C. and Adjacent Islands, G.S.C. Rpt. 996, 1908.

operations were proceeding with the driving of No.5 shaft. As outlined now, the body extends from the 1050 foot level to the surface, is 200 feet wide, and about 1000 feet long.

Mineralogy

In all, seven specimens were mounted and hand-polished on steel and billiard cloth laps. Following is a brief description of the minerals observed.

Metallics

Hypogene

(1) Pyrite. The mineral is widespread in occurrence. It is found in subhedral crystals, varying in size from small specks to particles over 1 m.m. across. It is found mainly in the quartz gangue, and is replaced by sphalerite, (Figure 4) and to a less extent by chalcopyrite (Figure 2). In one case it was observed as very fine disseminations in green chlorite.

(2) Chalcopyrite. Next to pyrite, chalcopyrite is the most abundant mineral. It occurs as fairly large anhedral masses, and as minute blebs in the sphalerite. In some places, as in Figure 2, it is replaced by sphalerite, and yet in other instances it occupies cracks that continue on through the sphalerite. This would suggest that there are two ages of chalcopyrite. Full 90 percent of the chalcopyrite particles showed extensive alteration to chalcocite on their outer ~~veins~~ RIMS. (Figures 1, 2, 3).

(3) Sphalerite. Sphalerite is fairly common in the sections. It occurs as large, irregular masses along

fractures in the quartz and with other sulphides in patches throughout the section. In the hand specimen it looks rather dark, suggesting a high iron content.

Supergene

(1) Chalcocite. Chalcocite occurs in two ways: as rims around the edges of chalcopyrite (Figure 3), and as minute veins in the sphalerite (Figure 4). It is interesting to note in the latter case that parts of the sphalerite that are veined by chalcocite show no inclusions of chalcopyrite, which is in marked contrast to parts in which no veining is apparent (Figure 4). This suggests the possibility that the chalcocite is the result of mass alteration of the blebs in sphalerite. How they became united into a single vein of chalcocite is obscure. Etch tests prove conclusively that the mineral veining the sphalerite is chalcocite and not covelite, as noted in other ore bodies in the mine.[2]

Non-Metallics

(1) Quartz. Quartz is observed in two forms: (i) clear and vitreous; (ii) milky. The second form commonly contains pyrite in finely disseminated specks, but the first form is, for the most part, barren.

Parageneses

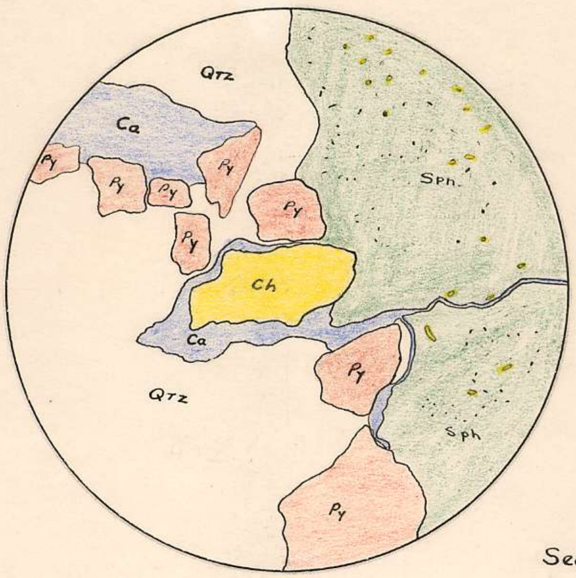
Mineralization began with an early period of silicification, followed by deposition of pyrite. Small amounts of chalcopyrite were then introduced, followed by the

[2]James, H. T., Britannia Beach Map Area, B.C. Mem.158, 1929, pp.80.

main mass of the sphalerite, which was in turn followed by the second and greatest deposition of chalcopyrite. Alteration followed with the changing of the outer rims of the chalcopyrite to chalcocite, and the veining of the sphalerite by the latter mineral.

Conclusions

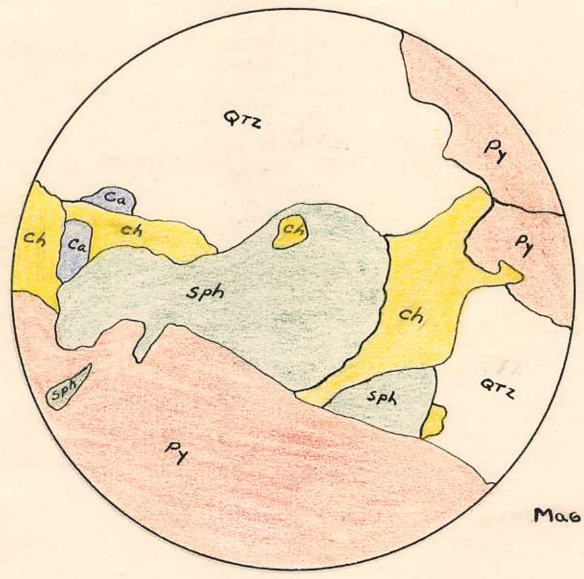
No gold was observed in any one of the seven sections, and on the basis of the work done by A. G. Lyle with the infrasizer and superpanner, it seems extremely unlikely that any gold will be seen with the present ore.



Mag 150[x]

Sect. 4

Fig. 1



Mag 150[x]

Sect 2.

Fig. 2

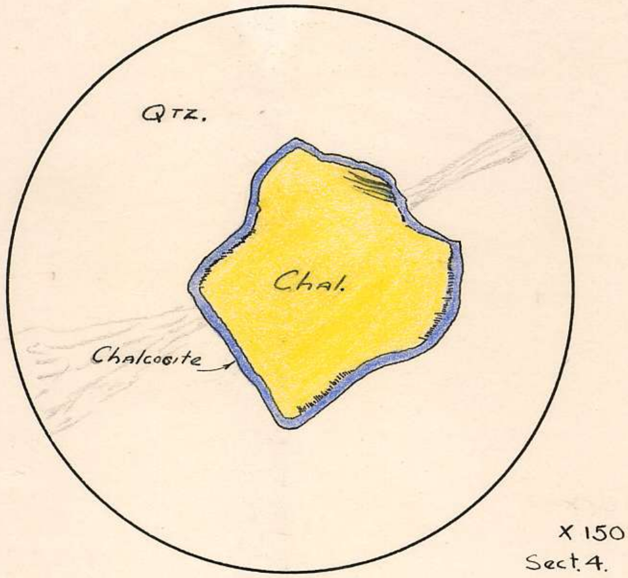
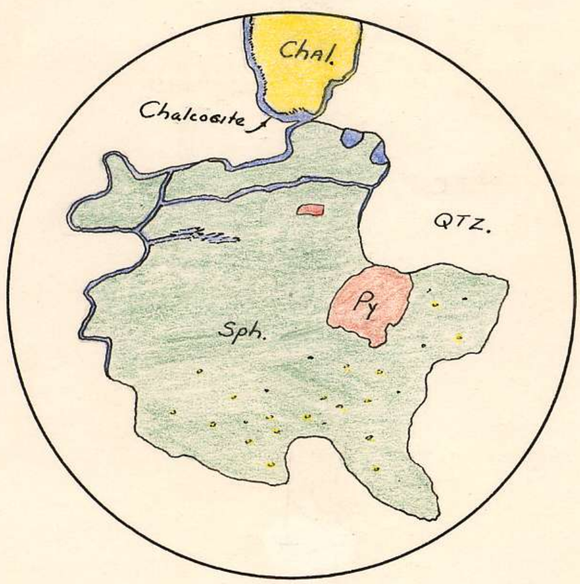


Fig. 3



X 150
Sect. 6.

Fig. 4