

mous quantities of aqueous vapours which in this case would have a profound effect on the limestone through which they would pass along zones of brecciation or bedding planes. The limestone has here been replaced by silicates rich in lime, and by sulphide ores with the consequent liberation of carbonic acid gas. With the exception of the lime and a small amount of magnesia, all the other constituents are foreign to the limestone and must have been brought up from below with the aqueous vapours.

An approximate analysis of the pyroxene gangue resulted as follows:

	Per Cent.
SiO ₂	55.25
Fe ₂ O ₃ and Al ₂ O ₃	6.50
CaO	25.00
MgO	14.50

Garnet (andradite) averages about 31 per cent. and vesuvianite about 35 per cent. of lime oxide.

The deposition of ore and gangue went on simultaneously with the cooling of the granite magma, and the ore body was formed before the intrusion of the aplite dykes. These dykes have not been found as yet in the Marble Bay mine, but they have been noted in two instances in the neighbouring deposits.

ORE VALUES.

The ore throughout is essentially high grade and carries good values in gold and silver. The ore which is finely disseminated through the pyroxene gangue carries much higher values in gold and silver, than the purer and more massive bornite and chalcopyrite. It has also been found that the percentage of copper has steadily increased with depth.

As it is necessary to mine considerable barren gangue which is intimately mixed with the productive, the ore is hand-sorted before shipping and graded into coarse and fines. The waste, on account of its fluxing properties, is shipped in large part and sold to the smelter. At present the total production is sent to the Tacoma smelter for treatment.

In order to ascertain the average value of the ore, the smelter returns for the year beginning in June, 1905, and ending June, 1906, were examined, with the following result:

Grade	Gold oz. per ton.	Silver oz. per ton.	Copper per cent. (dry)	Net value per ton.
Coarse . . .	0.498	4.138	6.765	\$28.77
Fines . . .	0.1673	1.569	1.602	\$6.88
Waste . . .	Tr.-08	0.15-0.9	0.22-0.8	\$0.50
Coarse. . .	1.006	5.73	11.25

The last entry of coarse grade refers to a shipment of 116 tons made in July, 1906.

About 13,000 tons are mined annually, and approximately for every ton of coarse, two tons of fines and two of waste are shipped. Through the courtesy of F. C. Robinson, of the Sheffield Smelting Works, I am enabled to publish a few interesting assays which he made of the ore and gangue. The samples were taken from a stope on the 660-ft. level, and the gold and silver values are stated in ounces per long ton.

Assays			Analyses		I	II
Number.	Gold	Silver.				
I.	0.40	18.60	Insoluble. . .	31.60	43.10	
II.	1.05	7.85	Copper . . .	34.00	13.60	
III.	0.008	0.04	Iron. . . .	10.30	9.90	
IV.	0.025	0.07	Lime. . . .	Trace	

I. Bornite and chalcopyrite, (massive ore).

II. Pyroxene and garnet gangue with finely disseminated bornite.

III. Calcite after removing mineralized portions.

IV. Calcite and garnet after removing mineralized portions.

Numbers III and IV are interesting in showing the occurrence of gold and silver in what was apparently barren gangue. Free gold in distinguishable leaves and grains has been found occasionally, but it is not a common occurrence.

SIMILAR DEPOSITS.

The ore shoots of the Copper Queen and Cornell mines adjacent to the Marble Bay are associated with basic dykes, some of which are older than the ore bodies. These are very much decomposed and in places have altered to a serpentine which carries ore, and is occasionally traversed by small veins of greenish white asbestos. The former mine has been noted for certain occurrences of free gold and argentiferous tetrahedrite. The deposits in the Whitehorse district, Yukon Territory, differ from the above, in that they carry low values in gold and silver, and higher values in copper. Their mode of occurrence, however, seems to be identical.

CONCLUSION.

The past development of these mines on Texada Island has proved the ore bodies to a considerable depth, the Copper Queen being 740 ft. deep, while a winze is now being sunk to the 860-ft. level in the Marble Bay. As regards the permanence of these deposits, there seems to be very little doubt they will continue until the limestone-granite contact shall be reached.

What is known as the "II" vein in the Le Roi No. 2 company's mine at Rossland is believed to have been discovered on the 900-ft. level. Drifting at that depth is in progress, and the vein is reported to be looking most promising. Average width has not yet been determined, but it is not less than 18 in. Assays so far give lower gold value than on the 700-ft. level, but copper is about the same, viz., 0.50 per cent. This discovery is regarded as important.

The Payne mine, group of mineral claims, concentrating mill, etc., situated near Sandon in the Slocan district, have been advertised for sale by auction in Montreal, Quebec. The company has for several years been in financial difficulties and operations on its property have been restricted to mining and milling on a small scale by lessees. The Payne was one of the earliest and most valuable locations made in the Slocan and during the mine's days of prosperity an aggregate of \$1,363,000 was paid in dividends.