REPORT ON ORE

600063

from the

REY ORO GOLD MINE

ZEBALLOS

VANCOUVER ISLAND

B. C.

by

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INTRODUCTION and ACKNOWLEDGMENTS.

The following report is the result of work done in trying to determine the occurence and association of the various minerals in the ore from the Rey Oro Gold Mine, Zeballos, B.C., special attention being given to the mode of occurence of gold.

The writer wishes to acknowledge the help given him by E.P. Davis and J. Donnan, in preparing and mounting the specimens.

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REPORT ON THE ORE FROM REY ORO GOLD MINE

ZEBALLOS B.C.

Location:

The Rey Oro Mine is situated on Goldvalley Creek, which enters the Zeballos River from the south about four miles above the town of Zeballos. The mine is about two miles up Goldvalley Creek and is on the eastern side of the valley. As yet there is no road to the mine. All supplies and machinery are taken in by pack horse from a station on the road between the Central Zeballos Mine and the town of Zeballos.

General Topography:

The whole area surrounding Zeballos is mountainous. The mountains seldom rise over 6000 feet but they are all steep and rough. In most places the hillsides slope very steeply up from the creek bottoms to the ridges.

The hills are generally heavily wooded with fairly thick underbrush. The vegetation hides many small but unscalable rock bluffs (about 50 feet high), which may extend along the hillsides for two or three miles.

The heavy vegetation, the rugged topography and the heavy precipitation make road-building and road-upkeep costly.

General Geology:

The most striking feature of the geology in the

Zeballos area is a large mass of northwesterly trending rocks, with an average composition of granodiorite. Gunning[(1)] calls this mass the Zeballos batholith. The batholith ranges in width from two miles, near the head of Goldvalley Creek, to three-quarters of a mile, where it crosses the Zeballos River and widens out again to four or five miles north of the Zeballos River.

The batholith has intruded early Mesozoic volcanics and sediments. Gunning has named these rocks "The Vancouver Group", which falls readily into a three-fold subdivision;

1. Karmutsen volcanics, a series predominantly andesitic to basaltic flows with considerable coarse volcanic breccias and tuffs. Interbedded with the volcanics are minor amounts of pure limestone in lenticular beds.
2. Conformably overlying the Karmutsen volcanics are the Quatsino limestones consisting of several hundred feet of limestone intercalated with tuffs.
3. Conformably overlying the Quatsino formation is the Bonanza group which consists of a greater variety of volcanic flows and fragmental rocks, with interbedded sediments.

Both the Karmutsen and Quatsino formations lie to the north-east of the batholith, but the Bonanza formation lies wholly to the south west of the batholith.

The Rey Oro lies wholly within the batholith and near

(1) Gunning, H.C., G.S.C. Summ. Rept., 1932 pt. 34, A 11.

the southern end of it.

Veins

Structure:

The dominant structures in the batholith are a series of veins which strike generally N. E. with a nearly vertical or a steep dip to the south. These veins seem to be associated with a large fault striking due north. This fault can be traced in the sediments north of the batholith and in the southern part of the batholith itself, but as yet no trace of this large north-south fault has been found in the batholith close to the Zeballos River.

All the veins which carry values in this area strike N. E. The veins are comparatively narrow (from 6 inches to four feet) but are rich and consistent.

The veins on the Rey Oro property are of two types:

1. Clean cut fissures in grandiorite completely filled with quartz and sulfides. The veins tend to weave and have branch stringers coming in from the north side.
2. Fracture zones in the grandiorite averaging about one foot in width. These zones consist of friable quartz-sulfide vein matter sandwiched between two layers of talcose gouge which contains some sulfides.

The main vein of the mine is of type 2, but it has a "horse" in it about 200 feet from the portal of the main tunnel. The length of the "horse" is not known as they have not mined past it.

Composition:

The veins are filled with bands of sulfides in a quartz gangue. Between the quartz-sulfide bands and the wall rocks there is about 3 inches of talcose gouge. The values are patchy but average about 1½ oz. per ton. The gouge carries gold in large quantities in some places. In the vicinity of the "horse" the values drop. A winze has been sunk down from the main level to a depth of 50 or more feet and the ore has not changed in value.

The presence of the gouge indicates movement along the vein after mineralization. This movement has made the ore extremely friable. The friability of the ore makes it hard to mount and to polish. The soft minerals such as gold and galena tend to pluck out easily.

Mineralogy:

Megascopically:

A migascopic examination of the ore shows the following minerals in order of abundance; quartz, pyrite and arsenopyrite with smaller amounts of galena, sphalerite and chalcopyrite. In the gouge the only sulfides visible are pyrite and a little arsenopyrite. The gold in the ore is not visible to the naked eye.

Microscopically:

Under the microscope the minerals seen in order of abundance were; quartz, arsenopyrite, pyrite, galena and gold. No sphalerite or chalcopyrite were seen in the specimens examined.

Quartz:

There are two generations of quartz. The primary quartz has been fractured and to some extent replaced by the sulfides. The fractures have been healed by the secondary quartz as seen in Illustration 1.

Pyrite:

The pyrite was deposited with or soon after the primary quartz. In some places in the sections it shows smooth boundaries with the quartz but in most places it is separated from the primary by the secondary quartz.

Arsenopyrite:

This mineral is the most predominant mineral in sections 2 and 3. It has been replaced to a large extent by the secondary quartz. In a few places contacts between it and galena and pyrite were seen. In most of these cases the boundaries show that the arsenopyrite was deposited with the pyrite.

Galena:

From evidences in the sections the galena was deposited contemporaneously with the arsenopyrite and towards the end of the pyrite deposition. The boundaries between the galena and arsenopyrite are smooth, while the boundaries between the galena and pyrite may be smooth, they often show the galena veining the pyrite.

Gold:

The gold was deposited with the pyrite, arsenopyrite and galena, as seen in Illustration 11, 111 and 1V. The boundaries between the gold and the sulfides are smooth. The gold particles were not large enough to be fractured and are not veined by the second generation of quartz.

Quartz:

This second generation of quartz differs from the primary quartz in that it is very translucent often showing opalescence. This quartz may have been deposited from a colloidal solution.

Description of Illustrations:

Illustration 1 Section 1 :

Primary Quartz, pyrite and galena fractured and the fractures healed by secondary quartz.

Illustration 11 Section 1:

Gold associa ted with pyrite. Note the smooth boundaries between the galena and pyrite; also the veinlets of quartz in the pyrite.

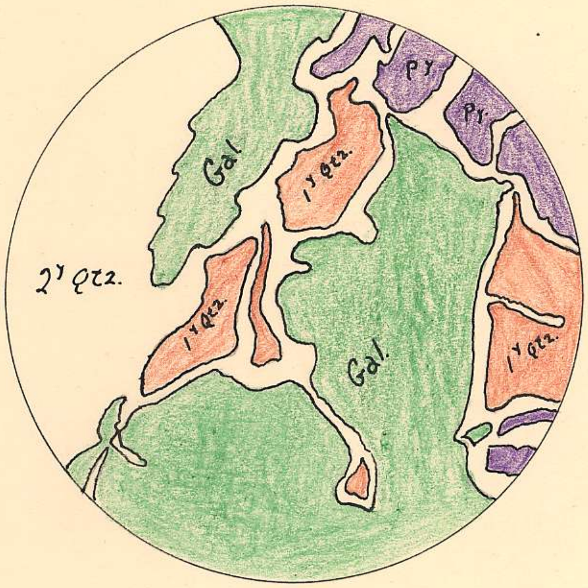
Illustration 111 Section 2:

Gold in association with the arsenopyrite. Note the fragmental nature of the arsenopyrite with the former outline of the crystal barely discernible.

Illustration 1V Section 2:

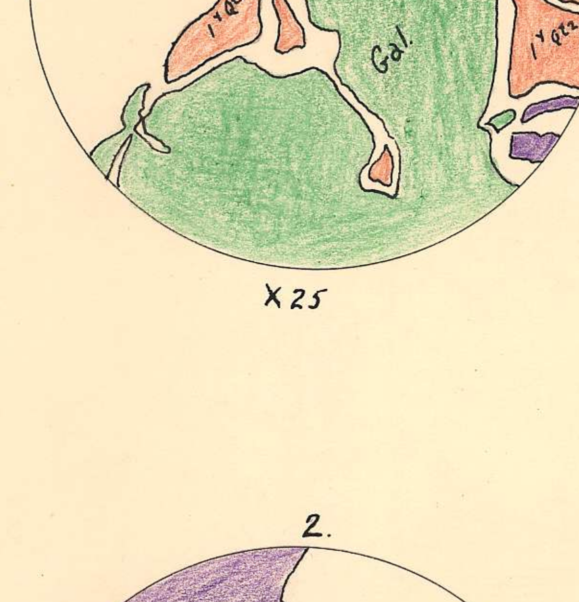
Gold in association with gal ena. Note the smooth boundary between the galena and arsenopyrite.

1.


Gal.
1y Qtz.
2y Qtz.
1y Qtz.
Gal.
1y Qtz.
Py
Py

X 25

2.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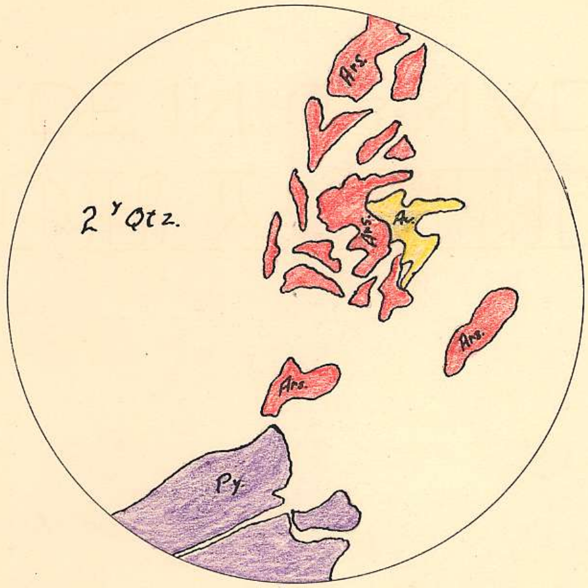
Au.
Py
2y Qtz.
Py.
Gal.
Au.
Py

X 25

3.



X25

4.

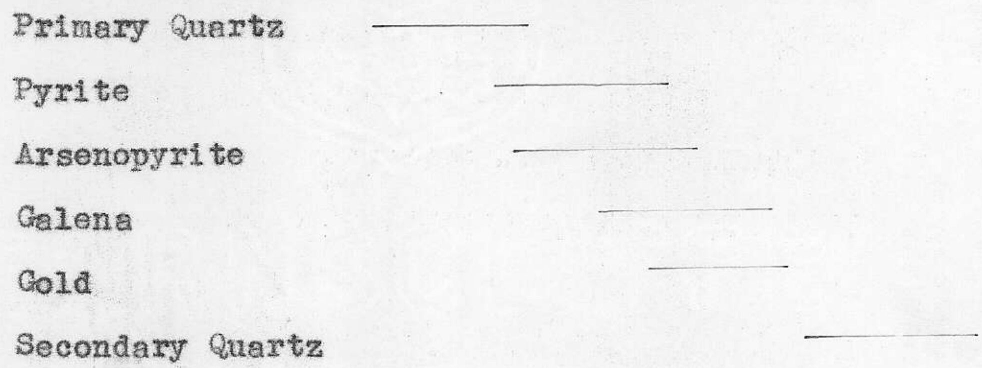
X25.

Paragenesis:

The following events, from evidence in the sections, took place in the formation of this ore deposit.

1. First fissuring.
2. Deposition of quartz followed later by pyrite, arsenopyrite galena and gold.
3. Fracturing.
4. Deposition of second generation of quartz.

Graphical Representation of the Order of Deposition:



Conclusion:

It was concluded the sulfides and gold came in practically contemporaneously. Perhaps the pyrite started to deposit a little before the galena and arsenopyrite. The gold was deposited at the same time as the sulfides. After the deposition of the sulfides and gold there was movement in the vein, perhaps the movement which produced the gouge, and the sulfides were fractured. These fractures were healed by the second generation of quartz, which from its clearness and opalescence seems to have been deposited from a colloidal solution.

Conclusion (continued):

The veins are of the mesothermal type, the ore being deposited under conditions of medium temperature and pressure. Thus the gold may be expected to go down to considerable depth.