

# Dolly Varden Mine—Its Geology and Ore Deposits

Paper read by Major Angus Davis, formerly mine superintendent, before recent Canadian Mining Institute Convention at Vancouver.

The Dolly Varden mine is located on the Kitsault River, about seventeen miles above where it empties into the sea at Alice Arm.

The elevation of the mine is about 1,700 feet.

A narrow gauge railway connects the mine with the sea.

This year, after completing the railway and considerable construction work, shipments of ore were started about the end of August. This is the first ore to be shipped in any quantity from the district.

The various mines of the Alice Arm district all lie in the andesite, and somewhere along the eastern border of the coast granite. The mineralizing solutions which have formed the veins of the district as supposed, according to the geologists, to have originated with this granite.

On the Salmon River, near Stewart, and fifty miles to the north, similar conditions obtain. The ore bodies of the two areas are identically formed.

The ore bodies at the Dolly Varden mine are replacement deposits along fracture zones in the andesite, which is the country rock in the area.

In the formation of these veins, the wall rock has been replaced by quartz accompanied by considerable pyrites and smaller amounts of galena, sphalerite, native silver, ruby silver, argentite and rhodonite.

The maximum vein width would appear to be about twenty-five to thirty feet.

It would appear almost certain that the ore bodies now opened up and being mined at the Dolly Varden mine are of secondary origin. Erosion has removed the zone of oxidation and the secondary ore is now exposed on the surface.

The main ore bodies occur in a not very large area, where the country rock has been broken up by a series of faults and fissures. Some of these faults occurred after the vein was formed, but at the same time mineralizing solutions ascending along the various fissures, some of them at right angles to each other had considerable to do with the formation of the ore. Owing to this repeated faulting and cross fissuring, mining operations have to be carried out with great care. In this connection the construction of a mine model, which, as a matter of fact, is now under way, would be of great use. I have no doubt that with the completion of this model certain facts will stand out which are not now apparent.

The greatest depth obtained on the vein at present is under 300 feet. A lower tunnel being driven this winter will give an additional 230 feet.

Referring to the main ore zone, the various minerals have fairly well defined horizons. At and near the surface

native silver occurs, in some places in extremely rich streaks. A little lower down are found native silver, argentite, stephenite and ruby silver. On the bottom level, about 270 feet from the surface, ruby silver or pyrargyrite is the principal silver bearing mineral. Fine grain pyrites carrying good silver values also occurs in ore from the present bottom level up to the surface. Just what the primary ore will be it is hard to specify. I should imagine that the principal silver bearing mineral will be pyrites with a little galena and zinc blende. However, the ruby silver is still very strong in the bottom level, and the secondary ore should still continue to a considerable depth.

I have never seen any cerargyrite or horn silver in the mine.

In mining the ground stands up extremely well. It is not necessary to do any timbering, which would increase the stoping costs immensely. Only the higher grade of ore is being shipped this year, at the same time the poorer ore left in the mine is always available when milling operations start. The quartz is extremely hard. In raising in the ore, in order to make any headway, it has been found necessary to discard stopers and use the heavy turbo water drill.

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