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THE SILVERY SLOCAN.

British Columbia's Leading Mining District.

THE following extract from the recent report of Mr. W. A. Carlyle, provincial mineralogist of British Columbia, will be new to nearly all readers in Eastern Canada, and is well worthy of careful perusal by practical miners and by investors who wish to get hints on the occurrence of precious metals, and the cost of working mines. Mr. Carlyle says :

The Slocan, according to the number of its shipping mines and the amount and value of the ore sold, now ranks as the most productive mining district in the Province, and in point of importance is not surpassed by any other.

In an area of fifteen by twenty-five miles, there have been discovered many veins of high grade silver-lead ore, which are being developed with great vigor and success, and among the mining men is every feeling of confidence and hopefulness. This winter nearly fifty of these properties are shipping high grade ore that yields very profitable returns, and a large number of other claims are being opened up.

So far but comparatively little imported capital has been expended here, as in the case of nearly every mine now established sufficient money has been realised from ore extracted during development to pay for more extensive workings, new buildings, mills, trails, roads and also dividends, but more or less capital will be required to properly open up many other claims on which the veins exist, but are not so easily accessible as those first discovered. But as most of these veins are found along the steep mountain sides and can be worked by tunnels, and the cost of mining is low, requiring little or no machinery, capital will be necessary mostly when tramways and concentrators are to be built, or in some cases for hoisting plants and pumps when tunnel sites may not be available.

Many of the mines are located near the summits of the high precipitous mountains at an elevation of 5,500 to 6,500 feet above sea level where erosion has cleared away nearly all the debris from the veins, but lower down also on the mountain sides and in the valleys, are being found other veins or those discovered first much higher up to the highest of which now run good trails or wagon roads or else wire rope tramways. The snow that lies deep on these summits during the winter is in no wise detrimental to mining operations, as most work is done after its fall, when the ore can be dragged down the smooth snow trails in rawhides in larger loads and at lower prices than are possible in the summer time, but the tracks of snow-slides must be carefully avoided.

During 1896, 18,215 tons of ore yielded 2,141,088 ounces of silver and 19,210,666 pounds of lead, or an average of 117.4 ounces of silver per ton and 52.7% lead which would have a net profit of about \$75 per ton, while many carloads were shipped that yielded from 300 to 400 ounces of silver per ton.

The "Slocan Star" has of course the larg-

est chute of high grade ore yet found in the district, and we are kindly permitted to state that from 11,529 tons of ore and concentrates sold during the last three years, 912,600 ounces of silver and 13,482,000 pounds of lead have been paid for by the smelters, and of these amounts 7,000 tons yielded 600,000 ounces of silver and 9,000,000 lbs. of lead during the past season of 1896.

Many of the veins are small, varying from 2 to 3 inches in width to 20 to 30 inches of solid ore, but the high value of silver at present makes this ore very profitable together with the low cost of breaking ground. The small Reco-Goodenough vein, the width of which is measured in inches, is probably the richest vein yet mined, as from the smelter returns of 600 tons the average was 407 ounces of silver per ton and 42% lead. The high percentage of lead makes this ore a very desirable one for the smelters, and the lead contents are usually sufficient to pay the freight and treatment charges, and the duty charged on the lead.

At no time in the history of the district have so many mines had high grade ore exposed, and of such mines can be named, among others the Slocan Star, Ruth, Wonderful Monitor, Idaho, Alamo, Cumberland, Ivanhoe, Queen Bess, Wild Goose, Payne Group, Slocan Boy, Washington, R. E. Lee, Last Chance, Noble Five Group, Reco, Goodenough, Blue Bird, Antoine, Surprise, Rambler, Best, Dardanelles, Northern Belle, Whitewater, Wellington, Charleston, Lucky Jim, London Hill, Reed & Tenderfoot, Fisher Maiden, Thompson Group, Galena Farm, Enterprise, Neepewa, Bondholder, Two Friends, Howard Fraction.

THE ORE AND ORE DEPOSITS.

There are 4 distinct kinds of veins in the Slocan :—

1. The argentiferous galena, with zinc blend, and some grey copper in a gangue or matrix of quartz and spathic iron. These veins cut across the stratified rocks, and through the dykes of eruptive rock, where, in many cases there is a good body of ore, and they also occur in the granite area, and with even the limited amount of prospecting, some have been traced from 3,000 to 4,000 feet along the strike, and one for nearly 2 miles. In the Slocan slates it has not yet been proven that as the vein cuts through shales, slates, limestones or quartzites, that any of the series has been more favorable to the formation of ore-bodies than another, as in the different veins it will be seen that good ore chutes may have the wall of any of these rocks mentioned. The ore has been deposited along fissures, both in the open fissure cavities and by impregnation of the country rock, and in the cavity-filled veins can be seen the banded structure described elsewhere, or the solid, usually big-cubed galena, shows lines of foliation parallel with the walls, but it is evident that further motion has occurred along some of these vein fissures after ore has been deposited.

Most of the veins are narrow, varying from 2 and 3 inches to 15 and 20 inches in width, with occasional widenings to 3 or 4 feet of solid ore, and even much more, as

seen in the Slocan Star and the Alamo-Idaho veins. The ore chutes are not persistent horizontally, as is characteristic of nearly all veins, but ore is often continuous for several hundred feet, and where it then pinches a thin streak of oxides is the index usually followed in the search for more ore, which seldom fails to re-appear with more or less work. The mistake is made sometimes of following along a slip-wall or crevice that may cross the vein crevice at a flat angle, and thus lead the miner astray. Besides the solid ore some veins have associated with them 2, 3 or more feet of mixed ore, gangue and country rock, or a brecciated mass which may be of such grade as to pay well for concentration ; and already there are three concentrators, the Alamo, Slocan Star and Washington, doing very satisfactory work, and the Noble Five mill almost completed, with the erection of two, at least, contemplated this year. The product or concentrates is silver-bearing galena, but any value contained in the decomposed material that may enter the mill, will in all probability not be saved, likewise, that in much of the grey copper, which apparently slimes badly and escapes.

The ore is shipped as "crude," or the solid or unaltered sulphides, or as "carbonates," i.e., the decomposed ore, consisting of oxides and carbonates of iron, lead and silver, the mass a reddish brown color, with more or less yellow material ; those carbonates with a soft, velvety feel, assaying highest in silver. All material about these veins should be carefully assayed before being relegated to the waste dump, where good ore, unsuspected, has already been thrown, especially soft, iron-stained decomposed rock or vein matter.

GOLD—It might be well to be on the outlook for gold, remembering the good gold values found in the galena ores of the Monitor mine, which yield from \$2 to \$14 in gold per ton ; one lot of 20 tons of crude ore assaying \$20 per ton in gold, while the carbonates average \$13, the smelter paying for all gold above \$22 or one-tenth of an ounce. The carbonates seldom are as high grade in silver as the unaltered, or crude ore in the vein, but in some mines this class of ore is very valuable.

When most of the veins are not wide, the richness of their ores greatly compensates, as may be seen from the lead and silver values as per smelter returns from a few of the mines, as :—

	ozs silver per ton.	per cent. lead.
Slocan Star ..	90 to 95	70 to 75
Reco	83 to 730	19 to 67
Goodenough ..	167 to 507	15 to 67
Noble Five....	62 to 543	30 to 75
Last Chance ..	135 to 238	35 to 78
Wonderful	113 to 133	70 to 76
Ruth	40 to 125	15 to 73
Monitor	142 to 367	32 to 57
Wellington....	125 to 328	10 to 55
Whitewater ..	72 to 326	10 to 65
Dardanelles ..	149 to 470	15 to 55
Enterprise	155 to 180	18 to 30
Two Friends ..	248 to 380	38 to 52
etc.	etc.	etc.

The other Slocan mines have ore of the