

THE BOUNDARY MINES

From the Second Annual Report of the Greenwood Board of Trade

(Prepared by E. Jacobs.)

In reviewing the prospects and condition of the mining industry of the Boundary district of British Columbia it is necessary to direct attention to several facts tending to show that a comparison with the older and better developed mining districts would not be fair to the former unless due allowance were made for the attendant circumstances unfavorable to it. The lack of railway transportation facilities prior to last year involved heavy and almost prohibitory freight charges on machinery, plant, material and mine stores. Power plants in use at its mines are, except in four or five instances, consequently of comparatively small capacity and development work has necessarily been slow, the more so since the date necessary for the advantageous working of the mines can not be so speedily obtained where big bodies of generally low grade ore have to be opened up. Then whilst the branch railway lines to several of the principal mines have been completed, the smelter at Greenwood has only lately been put in operation. It has though proved a distinct success, as, too, has that at Grand Forks. The enlargement of the treatment capacity of the latter is now in progress, and a copper converter is to be added to each smelter as well as new furnaces. Further, the district has not yet, except in a few instances, had the benefit of the expenditure of any considerable amount of outside capital. So it has resulted that, with only a limited amount of capital available, actual mining operations have been much restricted, whilst the previous absence of suitable transportation and smelting facilities greatly retarded progress. The prospects for early improvement are, however, very encouraging. With transportation and ore reduction needs largely provided for, several of the mines settled down upon a producing basis and so encouraging the further expenditure of capital for their adequate equipment and more extensive operation, the contemplated early resumption of work on properties that have been closed down and the general local experience, that values improve with depth, the outlook is becoming increasingly satisfactory.

Within a radius of about eight miles of Greenwood there are a dozen mining camps, in each of which numerous mineral claims have been located. Of these camps there are five that, as a result of the comparatively large amount of development work done in them, have come into prominence. These are Deadwood, Greenwood (also known as Phoenix), Summit, Wellington and Central (also known as White's) camps. Most of the ore shipped from the district mines has so far been the product of the three first named camps, Greenwood camp having a long lead in this connection, with Summit camp next and Deadwood camp third on the list. The positions of the latter two are, however, likely to soon be reversed, for the daily output of Deadwood camp is now more than twice as large as that of Summit camp. Wellington and Central camps have both ceased shipping for the time, nor does it appear as if they will again send out any considerable quantity of ore for some time to come. With the single exception of No. 7, in Central camp, there does not seem to be any property in either of these two camps likely to maintain regular shipments of ore during the ensuing summer. On the other hand it is very probable that before the snow flies this year the output of Greenwood camp alone will be larger than the present total tonnage of the whole of the Rossland mines, and that both Deadwood and Summit camps will respectively increase their output.

DEADWOOD CAMP.

At present the only producing mine in Deadwood camp is the Mother Lode. The Morrison bids fair ere long to join the comparatively few regular shippers the district yet possesses, and possibly the Crown Silver, of the Sunset group, will do likewise before the close of the current year. Other claims

which have been under development but which do not yet give promise of adding very much to the output of the camp are the Ah There, Buckhorn, Greyhound, Great Hopes, Marguerite, and Sunset, all classed as copper-gold properties. The D. A. and Gold Bug, two of the Boundary Creek Mining and Milling Company's claims, having narrow veins rich in gold and silver, are two more claims that have not yet come up to expectations.

There are seven steam power plants in Deadwood camp. The plant installed at the Mother Lode in 1898 included two 60-horse power boilers; 18x21 Ingersoll-Sergeant straight line air compressor, rated for 10 drills; five machine drills, air receiver, 7½x10 hoisting engine and two auxiliary hoists, an electric light plant, etc. Recent additions include a cross-compound condensing Corliss valve Ingersoll-Sergeant compressor, with compound air end and intercooler, high and low pressure steam cylinders, 22-inch and 40-inch respectively, all cylinders of the piston inlet type, high and low pressure, 19¼-inch and 32½-inch respectively, and 48-inch stroke, the machine having a capacity of 30 to 40 drills and weighing 166,000 pounds. Steam is supplied to this engine by two 66x16 horizontal return tubular boilers, each 100-horse power for 125 pounds working pressure, and having horizontal smoke connection and one stack. The new hoisting engine is a double-cylinder Corliss valve first motion hoist, cylinders 22x42 inches, diameter of drums six feet. Two 80-horse power boilers supply it with power. Two platform cages with safety clutches and shield roof have also been installed. An ore sorting plant comprises a 36-inch picking belt 111 feet long and return conveyor 41 feet long, a 12-inch fine-ore conveyor 110 feet long, a 16-inch waste conveyor 566 feet long (all lengths center to center), and all requisite shafts, pulleys, supports, etc. A No. 5 Gates rock crusher with a capacity of 40 tons per hour, and a 70-horse power Nagle engine complete this sorting plant. Additions to the electric light plant are a 250-light tungstenhouse dynamo with a full complement of arc and incandescent lights, and a 25-horse power Armington & Sims' engine to run the dynamo.

The Sunset plant includes two 80-horse power boilers, half of a 20-drill duplex air compressor, ten machine drills, one large and one small hoisting engine, safety cage, etc. The other plants in this camp are smaller.

The ores here, as in Deadwood and Summit camps, are principally chalcopryite, carrying also values in gold and silver. Some of the ore bodies are of large extent and, judging by the experience gained in treating Mother Lode ore, the general "run of mine" ore will return a profit if a favorable freight and treatment rate be obtained. The deepest shaft in the camp is that on the Sunset now down about 380 feet and still sinking. Arrangements are being made, though, to deepen the Mother Lode shaft to 500 feet. The Mother Lode ore body has been proved by three crosscuts to be at the 200-foot level about 90 feet in width along a distance of quite 350 feet, and the work in hand at the 300-foot level, so far as it has gone, appears to indicate that this comparatively large width is maintained at this lower level. A large vein of ore has also been cut on the Morrison. There are about 50 men employed at the smelter and not less than 200 more at the several mines of the camp, to which a branch of the C. P. R. has been extended.

GREENWOOD CAMP.

This camp has had more development work done in it to date than any other camp in the district. Its principal properties are the Miner-Graves group, including the Old Ironsides, Knob Hill, Victoria and Grey Eagle, the Dominion Copper Company's group, the most important claims of which are the Brooklyn, Stenwinder, Idaho and Rawhide, and the Snowshoe and Gold Drop, each owned by a separate company. There are as well other promising claims in this camp. Greenwood camp is noted for its big deposits—which may without any ex-

aggeration be described as enormous—of copper-gold ore. Values do not yet, as a rule, run high, the average value, for instance, of more than a million tons of ore blocked out in the Knob Hill, having been placed by the mining superintendent at \$5.37. In nearly all cases with any depth the ore shows a general sameness in appearance, i.e., chalcopryite with hematite (micaceous iron) and some iron pyrites mixed with calcite and some quartz in a greenish eruptive rock, showing a considerable alteration and sometimes having a schistose structure. In some cases the ore bodies along their trend are capped with magnetic iron oxide through which is disseminated in varying quantities (though as a rule small percentages), copper pyrites. The ore bodies appear to occur in contact with lime and diorite and have a general northerly and southerly trend and an easterly dip. The ores are generally self-fluxing and well adapted for smelting.

With the exception of the Rawhide, all the Greenwood camp mines are worked by power plants. The Miner-Graves properties are together equipped with four 80 and one 60-horse power boilers, two 10-drill duplex air compressors, eight hoisting engines, nine pumps for various purposes, about 30 machine drills, an electric lighting engine and dynamo, and a lot more machinery. A timber-framing machine with wedge and spring saws has been ordered, and a 40 or 45-drill cross compound condensing Corliss valve air compressor, 40 machine drills, a 500-horse power hoisting engine, a full complement of boilers—probably 600 horse power—a rock crusher of 2,000 tons daily capacity, and one or two other machines are shortly to be added to the equipment of these mines. The Snowshoe has two air compressors, four machine drills, two boilers—one 40-horse power locomotive and one 70-horse power horizontal return tubular—two hoisting engines, pumps, etc., and will probably put in a much larger plant shortly. The Gold Drop has a 40-horse power boiler, 4-drill air compressor, and three machine drills. On the War Eagle are a 80-horse power boiler, half of a 10-drill duplex air compressor, a 20-horse power hoisting engine, pumps, etc. The Brooklyn and Stenwinder group have three boilers, two 5-drill air compressors, two steam hoists, pumps, etc., and are adding half of a 20-drill Corliss air compressor, 10 machine drills, two 40-horse power boilers, a 75-horse power hoisting engine and other plant.

The Old Ironsides No. 2 shaft, now down 400 feet, is one of the deepest shafts in the district. The Stenwinder shaft is 315 feet in depth. Spur railway lines connect with the Snowshoe, Brooklyn, Stenwinder, Old Ironsides and Knob Hill mines. The Old Ironsides and Knob Hill group are by far the biggest shippers in the Boundary district and there is little likelihood of the mines of any other company coming any where near them as regards output of ore, especially after they shall have doubled their present daily output of 620 tons, which they are preparing to do, concurrently with the increase now being made in the treatment capacity of the Granby smelter at Grand Forks. These mines have large and comfortable bunk and boarding houses for their men, besides a number of cottages for the families of married employees.

SUMMIT CAMP.

Summit camp also contains numerous mineral locations. Prominent among these is the B. C., which is considered to be one of the most promising mines in the Boundary country. The ore body is very wide and consists of solid copper pyrites and pyrrhotite, carrying from 10 to 16 per cent copper and 8 to 10 ounces silver per ton. Its working shaft is 410 feet in depth. Three distinct shoots of ore have been exposed by the work done so far and these yield ore of a higher average value than that met with in some of the other camps of the district. The plant of the B. C. includes four boilers, together about 225 horse power, a straight line Rand four-drill air compressor, half of a Class G. Ingersoll-Sergeant air compressor, rated at 10 drills, one large and two small hoisting engines, two sinking pumps, an electric light engine and dynamo and a full complement of accessories. The plant at the Oro Denoro includes boiler, air compressor, machine drills, hoisting engine and steam pump. The Maple Leaf, one of the Rathmullen group of claims, is similarly equipped, and a small power plant is now installed on the R. Bell. The Blue Bell, on which development work was but

recently commenced, has short drifts at both the 50-foot and 100-foot level in a nice ore body. Other well known claims in Summit camp are the Emma, Mountain View, Cordick, Josi-Wake and a half dozen others.

Branch lines connect this camp with the C. P. R. main line at Eholt. There are about 130 men employed in Summit camp, which is eight miles from Greenwood. North of Summit camp, about two miles is Pass creek, along which some promising discoveries of copper ore have been made.

WELLINGTON CAMP.

In this camp there are four properties that have been worked, but all except the Winnipeg are idle just now. These are the Athelstan, Winnipeg, Golden Crown and Hartford.

The Winnipeg is down 425 feet and the Golden Crown 322 feet. Both have run drifts and crosscuts at several levels down to the 300-foot, and the Winnipeg is now crosscutting at the 400-foot level. Both mines are equipped with steam boilers, hoists and pumps, air compressors, machine drills, etc. The Athelstan also has a power plant, but of smaller capacity. The country rock here is of a dark feldspathic nature, while some of the principal ore bodies occur in gabbro, which appears in quite extensive areas and in the case of the Winnipeg vein the enclosing rock is serpentine; this, however, is merely an altered gabbro. The ore in this camp is chiefly pyrrhotite near the surface, but as depth is gained it becomes silicious and carries higher gold values.

CENTRAL CAMP.

In Central camp are several properties considered very promising. These include the Mabel, Oro, Cornucopia and the City of Paris and Majestic group. The City of Paris has shipped about 2,000 tons of ore to the Granby smelter. The two last named mines together get their power from the same plant, which includes two 80-horse power boilers, a 10-drill duplex air compressor, 6 machine drills, steam hoist, pumps, etc. The No. 7 is equipped with a 100-horse power boiler, a 4-drill compressor, two machine drills, hoisting engine, pumps, etc.

The ore is in two general classes i.e. the silicious or quartz ores, carrying gold and silver in galena, blende, pyrites and tetrahedrite, and the heavy sulphide ore carrying copper. Of the first class, the ore occurs in veins up to 10 feet in width and assays as high as \$80 in gold with 200 ounces of silver per ton. Of the second class the ore bodies are large and give good copper values with some gold.

SKYLARK AND PROVIDENCE CAMP.

These are situated in the immediate vicinity of Greenwood. Narrow veins of ore rich in gold and silver, are the chief characteristics of these camps. Between 150 and 200 tons, in all, of high grade ore have been shipped from Providence, Strathmore, Last Chance and Skylark claims, the values returned being generally comparatively high. The Strathmore has a shaft 70 feet in depth and about 240 feet of drifting and crosscutting. The Last Chance has a 100-foot shaft and other development and is equipped with a steam power plant.

SMITH'S CAMP.

In Smith's camp quartz ores prevail, values being in gold and silver. The Republic group of four claims has had the most development work done on it in this camp, this consisting of 317 feet of drifting and raising and 380 feet of drifting and crosscutting. The Boundary Falls and neighboring claims occasionally show free gold. The American Boy, Ruby and Goldconda group, the last named having arsenical iron and copper ores, are other well known claims. The ore in this camp occurs in veins from one foot to five feet in width, giving gold values, and in some cases, high silver values.

COPPER CAMP.

Copper camp has immense surface showings of copper ore, but as yet only a very limited amount of development work has been done in this camp, the principal claims in which are the Big Copper and King Solomon. There is a small steam power plant on the latter claim. The copper deposits here occur in contact with lime and porphyry and show large surface outcrops of iron oxide (red hematite) and quartz. In some cases native copper cuprite and copper glance are distributed throughout this country.