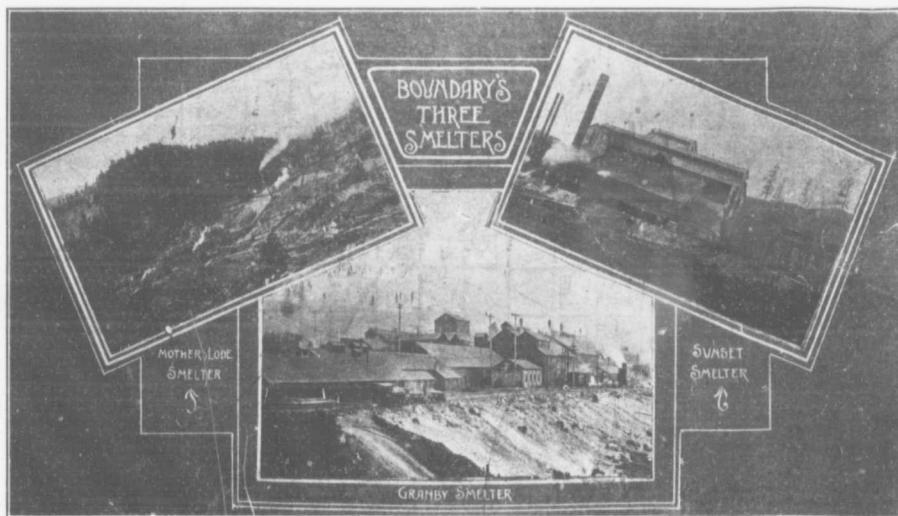


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Boundary Mining District

British Columbia.

ITS WORKING MINES AND SMELTERS.

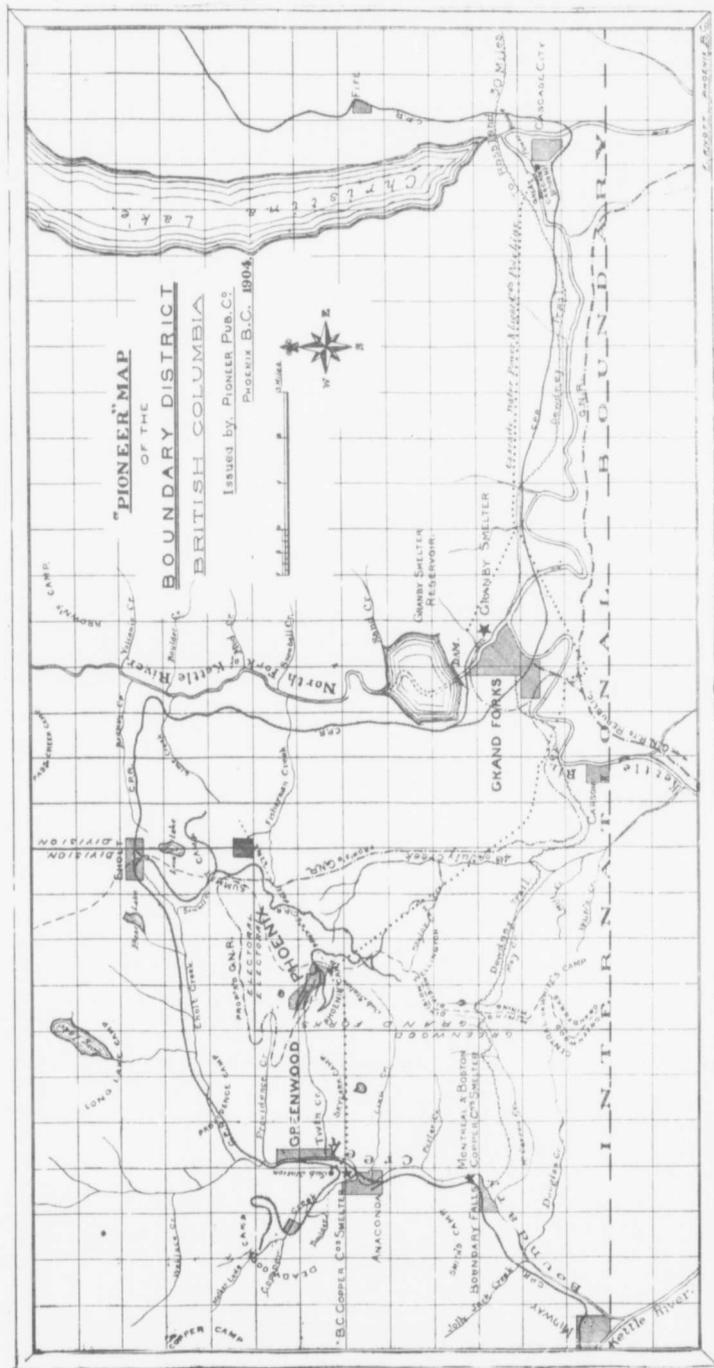


Special Issue

THE PHOENIX PIONEER AND BOUNDARY MINING JOURNAL.

Price, 25 Cents.

Phoenix, B. C., January, 1904.



It will be noted that this map, drawn to scale and engraved specially for this issue of the Phoenix Pioneer, has the following useful features:

1. Every city and town in the Boundary.
2. The several Boundary camps.
3. Boundary's three smelters.
4. C. P. R. lines and branches in the Boundary.
5. Great Northern railway survey from Grand Forks to Phoenix.
6. Cascade electric power line.
7. Grand Forks and Greenwood Mining Divisions boundary line.
8. Grand Forks and Greenwood Electoral Divisions boundary line.
9. The Dewdney trail (original route into the Boundary).

60 miles (about) of Canadian Pacific Railway track in the Boundary are earning for the treasury of that company from

\$1,500 to \$2,000 per day.

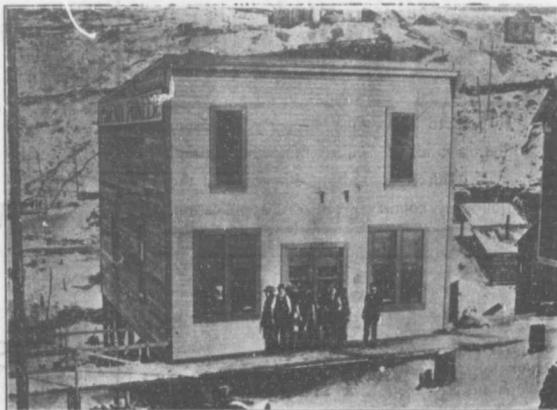
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Youngest reader of the Phoenix Pioneer.
aged two years.



Home of Phoenix Pioneer and Boundary Mining Journal.
Stemwinder mine 200 yards to rear of Building, and No. 4 Granby tunnel 40 yards to right.



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THE GREAT BOUNDARY MINING DISTRICT

SOUTHEASTERN BRITISH COLUMBIA

COMPLETE HISTORY OF ITS WORKING MINES AND SMELTERS

SPECIAL ISSUE OF THE

Phoenix Pioneer and Boundary Mining Journal, Phoenix, B. C., January, 1904

ACCORDING to the general understanding of the oldest of the old settlers, the first man to come into what is now known as the Boundary Mining District of Southeastern

British Columbia, was Charles Deitz, who arrived in this section in the year 1857. Mr. Deitz is still a resident of the Boundary, now living in a comfortable old age on his ranch a few miles above Rock Creek. Old "Jolly Jack" Thornton was supposed to be the second man to reach this now well known mining region. As early as 1862 Boundary creek was worked for placer gold, and there was a small settlement south of the international boundary line, near where the town of Midway is now located.

In the year 1884 the first mineral claims were staked in Southern British Columbia. These were the Eagle, on Hardy Mountain, by James McConnell, and the Victoria and Washington, afterwards Old England, on Rock creek, a few miles above Kettle river. W. T. Smith and John East came to the Boundary district in 1887, and located the Rocky Bar claim, now the Tunnel, on Boundary creek, near the falls. In the same year they also located the Nonsuch in Smith's camp. In the same year, 1887, the Bruce claim, on Ingram Mountain, near Midway, was also located by East.

Three prospectors, George and David Leyson, and George Y. Bower-

man, located the Big Copper, in what is now Copper Camp. The claim was then known as the Bluebird. Afterwards they went over the Dewdney trail to Rossland, where some locations were also made, and the Boundary claims were allowed to lapse. The King Solomon, in Copper Camp, was

staked the Mother Lode in Deadwood camp, and on June 2nd of the same year John East and William Ingram located the Sunset and Crown Silver in the same camp.

By this time the pioneer prospectors were beginning to cross over the valley to where the city of Phoenix now



ONE OF THE OLDEST MINERS' CABINS ON BOUNDARY CREEK, BUILT IN 1886.

staked by Ed. Lefevre and James Lynch, and in 1888 it was acquired by D. C. Corbin, of Spokane Falls and Northern railway fame. In 1890-91 some locations were made by James Atwood and John Lemon near the Buckhorn, in Deadwood camp. On the 23rd of May, 1891, William McCormack and Richard Thompson

stands, and Matthew Hotter located the Old Ironsides in July, 1891, and Henry White located the Knob Hill about the same time. Jas. Atwood and James Schofield located the Stemm-winder and G. W. Rumberger and Joe Taylor located the Brooklyn; other locations in this camp followed in rapid succession. Atwood and

Schofield also discovered what is now Summit camp, and made locations. The Providence, which is now paying dividends, was located in 1892 by William Dickman.

About this time Howard C. Walters, an energetic mining man from Spokane, came into the Boundary, and acquired a number of the high grade claims, as no others would then pay to work, with the nearest railway 75 miles away, and no wagon roads or trails in the country. However, Mr. Walters, who had organized a company known as Spokane & Great Northern Mining Co., finally succeeded in getting in a two stamp mill, which was set up at Boundary Falls, to treat the ores of the American Boy and Boundary Falls claims. Mr. Walters also bought the Providence, and made some shipments to the Everett smelter, which notwithstanding the great cost of packing on mules to the railway, at Marcus, Wash., netted several thousands of dollars. Silver went down, however, in 1893, and this discouraged the prospectors in the Boundary, and for a while this section was pretty nearly deserted. However, the Skylark, which was located in 1893 by James Atwood, is said to have shipped ore which netted more than \$30,000.

Location of Boundary Towns.

As far as the records show, the first townsite platted in the Boundary Creek District, as it was then called, after the creek of the same name, was Miwday, first called Eholt. This was acquired by Capt. R. C. Adams, of Montreal, and associates, in 1893.

The site of the present town of Greenwood was acquired by Robert Wood and associates in 1895, who immediately founded the town and platted the lots. Anaconda, adjoining, was founded previously, and Mr. Wood made an unsuccessful attempt to purchase it first.

Grand Forks, located at the junction of the main Kettle river and its North Fork, was one of the earliest settlements, being a diverging point. The site, which was owned by George McRae, was sold to John A. Manly in

1893, who shortly thereafter founded the town by platting it, and has been pushing it ever since.

Phoenix, which was originally known as Greenwood camp, and from which the town of that name was called, was virtually established in 1899. When the gigantic ore bodies of the Old Ironsides and Knob Hill mines began to be appreciated on the outside, that and the building of the C. P. R. into the district attracted a great deal of attention to this camp. About the same time Mann & McKenzie and associates took over the Brooklyn and Stemwinder groups for the Dominion Copper Co. Geo. W. Rumberger platted the Cimeron mineral claim in the fall of 1899, J. B. McArthur also platting the New York claim in the same

the Phoenix line would branch off there.

Cascade is one of the oldest towns in the Boundary, having been platted in the very early nineties, and during the railway building enjoying a genuine boom, and being at that time one of the most important of Boundary towns.

A conservative estimate of the population of the Boundary district has placed it at about 10,000 persons. As is well known, the most important industry is that of mining, being the industry on which all others practically depend. Other industries and occupations are well represented, lumbering being carried on to a considerable extent and farming becoming more and more important each year, with a



"JOLLY JACK"—JOHN THORNTON IN FRONT OF HIS CABIN.

year. In November of that year the Miner-Graves syndicate, as the owners of the present Granby mines were then known for brevity, placed the Old Ironsides sub-division to Phoenix on the market, all of the Phoenix property having one of the most remarkable sales in the history of townsite selling in British Columbia. It is within the memory of the writer that persons travelled hundreds of miles to buy Phoenix business lots at the opening sale, only to find them already sold.

Small settlements also grew up at Deadwood, Carson, Boundary Falls, Eholt, etc., the latter when the railway was built, and it was found that

splendid market close at hand, being the numerous mines and smelters of the district, and the communities growing up around them. The valleys are admirably adapted to fruit raising, and fruits of all kinds are cultivated in the greatest profusion.

BOUNDARY DISTANCES.

Railway distances in the Boundary from Nelson, the C. P. R. divisional headquarters, are, approximately, as follows:

	Miles
Cascade	83
Grand Forks	96
Eholt	110
Phoenix	120
Greenwood	118
Midway	127

ORE DEPOSITS OF THE BOUNDARY DISTRICT.

By R. W. BROCK, of the Dominion Geological Survey, Ottawa.

THE district treated of here is that lying along the International Boundary line, in the neighborhood of and between the valleys of the North Fork of the Kettle river and Boundary creek, B. C. Following upon the construction of the Columbia & Western railway, a little over four years ago, and the installation of smelters at Greenwood and Grand Forks, three years and a half ago, the district at once took a foremost place in British Columbia lode mining, and it now ranks as one of the most important factors in the production of copper in Canada.

While the mountains are not rugged and the western and southern slopes are often open, prospecting has not been easy, on account of the covering of drift which conceals the rocks over a considerable portion of the surface, and on account of the complex geological structure of the district. Eruptive rocks, including granites, greenstones, lavas (and associated stuffs) and various intrusive dikes, have the widest distribution. More or less altered sedimentary rocks (limestone, argillites, quartzites), together with more highly altered metamorphosed rocks, including serpentine, are met with in all parts of the district; but do not, as a rule, have large dimensions in any place, being usually nothing more than inclusions of older formations, caught up in the intrusive rocks.

The oldest rocks recognized in the district are the sedimentary and crystalline rocks. In the southeastern part of the district, just west of Grand Forks, some crystalline mica and hornblende schists and crystalline limestone occur, which resemble, lithologically, the rocks of the Shuswap series (Archean), but they may possibly merely represent in a more highly metamorphosed form the argillites and limestones found elsewhere in the district.

The argillites are normally dark or red, occasionally highly carbonaceous, but are often altered to grey knotted schists, or hornfels, or they may be largely silicified. The limestones are usually white and crystalline, but oc-

asionally show an original black color. In places the lime is replaced by silica forming cherty or quartzite-like jasperoid rocks. True quartzite is only sparingly found. Closely associated with these is a serpentine, probably derived from a basic eruptive rock. It is frequently altered to a siliceous dolomite or magnesite. These rocks form a series closely resembling and probably the same age as the Cache creek series described by Dr. Dawson, and ascribed by him to the carboniferous formation.

Somewhat younger than the sedimentary rocks is the greenstone, which has the greatest areal distribution of all the rocks of the district. Often it is altered, but where its structure is preserved, it appears to be an augite-porphyrite, sometimes agglomeratic, similar to that rock found in many parts of West Kootenay, notably around Rossland. It cuts and holds inclusions of the older rocks; indeed, in most of their occurrences the latter appear simply as islands in the greenstone, varying in size from small fragments, closely packed and almost filling the greenstone matrix, to bands hundreds of meters long. Under pressure it becomes schistose and difficult to detect from some of the included argillites. Occurring with it are bands of a tuff-like rock, filled with fragments of the older rocks, and interbanded with fine-grained ash-like bands.

Younger than, and cutting the greenstone, is a gray hornblende-biotite granite, which is exposed near Greenwood in Wellington camp, and on Hardy mountain. Gray granite porphyry dikes from it cut the older formations a long way from the parent masses. The white altered porphyry on McCarren creek and at the City of Paris mine may belong to this series of dikes. This granite will probably prove to be the same rock as the Nelson granite, of West Kootenay, and about Jurassic in age. Near Central camp, and northwest of it, are bosses and dikes of a gray granite rock, which closely resembles the Rossland monzonite, but until it has been carefully studied it is still uncertain that it is the same rock. Younger granites occur just outside the area described.

Beds of volcanic rock are found at several points overlying the rocks already referred to. These are remnants of a sheet of volcanics which once covered the entire country, but which, in this district, have been largely removed by erosion. The series consist of coarse and fine stuffs, ash beds and shales (in which coal is at times found), with sheets of andesites, basalts, and other volcanic rocks. These latter are sometimes locally termed "bird's-eye porphyry." This series is probably of Tertiary age.

Dikes of a reddish or yellowish syenite-porphry, having a fine-grained ground mass, with conspicuous rosette-like phenocrysts of feldspar and some biotite, are common in the mineralized portions of the district, though wanting in the unmineralized. On the Carbonates claim, this reddish porphyry is seen as a contact facies of a coarse syenite porphyry similar to those observed east of the North Fork and in the Rossland district, where such dikes are known to be from the Rossland granite. They would appear to have the same relationship here, but it is yet to be proved that they have no genetic connection with the volcanic flows as well. Dark lamprophyric and dikes some of a brownish basalt-like rock also occur.

The ore bodies may for convenience be roughly divided into three classes: (1) The low grade copper bearing sulphide deposits; (2) The oxidized copper veins, and (3) The small gold and silver-bearing quartz veins.

Undoubtedly the most striking characteristic of the deposits of the first class is their enormous size. In structure these deposits belong to composite-vein type, formed by mineralizing solutions traversing the country rock, principally along fissures or zones of fissures in which they deposit the economic minerals, and from which they replace with their mineral contents, particle by particle, sometimes partially, sometimes completely, the original material of the country rock. On the outskirts of an orebody this substitution may be seen in all stages of development, the individual constituents of the country rock being one by one replaced. Sometimes, as on

the Emma claim, the replacement of the country rock has gone on so evenly that a completely banded ore has resulted. A banded structure cannot therefore be taken as a proof of open filling.

According to the most prominent mineral content, this class of deposits may be subdivided into pyritic type, in which pyrrhotite, chalcocopyrite, with some pyrite, are the chief minerals. Excepting that the pyrrhotite of the one is represented by magnetite in the other, these two types appear to be identical. Both the magnetite and the pyrrhotite replace the constituents of the country rock in the same way, both seemed to have been formed on the whole, a little prior to the other vein minerals, holding them in little veins, or as points scattered through, yet sometimes interbanded with them; they are both accompanied by the same accessory and gangue minerals, and the country rocks show the same alterations in both cases. Rarely do both the pyrrhotite and magnetite occur in the same deposit.

Besides the metallic minerals already mentioned, some marcasite appears to occasionally be present, and sometimes arsenopyrite, galena, zinc-blende and molybdenite; but these are in all cases subordinate in quantity. Tetrahedrite has been found on the City of Paris. Specular iron is found somewhat sparingly, and bismuthinite occurs on one claim.

Calcite is a common gangue mineral, sometimes well crystallized, forming large masses, and also in the little seams through the ore and country rock. Seldom is it found in large quantities in those parts of a vein in which magnetite is heavily concentrated. Quartz is also an abundant gangue stone, occurring in the same way as the calcite, though I have not observed it well crystallized. Silification of the country rock to a cherty quartzite-like (jasperoid) mass, is a common, though not invariable, phenomenon in the neighborhood of a vein. Red and green, garnet (probably grossularite and almandine) epidote are very abundant in and near the veins, both well crystallized and massive, often interbanded with the ores, and forming a very large percentage of the vein mineral. The progress of this formation may be observed at many points in all stages not only when limestone, but also when greenstone and granite form the country rock. In the Mother Lode, where limestone seems to be the country rock, while these minerals are developed, the chief mass of the altered rock is made up of

a felt-like aggregate of short green fibres apparently of actinolite. A beautiful white radial tremolite occurs in the limestone at the Morrison mine. Kaolin, chlorite and serpentine are probably among the alteration products, but until the microscopic examination of the rocks has been made, an accurate account of the secondary minerals and their relative importance cannot be given.

The ores occur in all rocks except the most recent, the latter being the youngest granite, the porphyry and basic dikes and the Tertiary volcanics. In age, then, these deposits are probably early Tertiary. So far as yet found, mineralization is confined to districts which show evidence of recent disturbance, more particularly where the older rocks are cut by the recent intrusives. Limestone in such a district seems favorable for the disposition of ores. In some cases the ore occurs in the limestone itself, but more frequently it is found in a rock along its contact with limestone. Thus, in a greenstone, where it holds inclusions of limestone, the ore often occurs in the greenstone along its contact with the limestone, while the latter may show little or no mineralization. The lack of mineralization in the limestone in such cases may be due to the fact that the lime often flows and forms compact lenticular masses, instead of fracturing under pressure, and thus furnishes no channels for the mineralizing solutions. If attacked and replaced by them, it must have been along the contacts, and this must have taken place comparatively evenly, leaving a clean cut unmineralized wall. While this may have been the case in some of the larger deposits, in many of the smaller veins occurring along such contacts, the mineralization shows a distinct preference for the greenstone, the limestone remaining unmineralized. That the contacts between lime and other rocks should be favorable may have been due in part to the chemical influence of the lime in precipitating the mineral contents of the solutions, but it was also due to the lack of firm cementing between the limestone and the contact rock, which left free channels that the solutions used as high-ways and bases for their operations; but while such contacts are favorable, mineralization is by no means confined to them. While most of the deposits are in greenstone, limestone or contacts between these, they also occur in the serpentine argillites and gray granite.

Porphyry dikes are usually to be found in close proximity to the ores;

the ore lies parallel to a dike along its contact or in the near neighborhood. The dikes while containing traces of metallic minerals, show no signs of mineralization. In age they are about the same or a little younger than the ore deposits, showing the deposits to have been formed during or before the close of the cooling of the eruptive magmas.

While the deposition of the mineral contents of the veins is evidently largely hydrothermal, many of the minerals formed are characteristic of contact zones, and there seems to be strong reasons for supposing the deposits to be connected with eruptive after-actions. The reasons for this belief cannot be discussed at length in the limits of a short paper. The magnetite appears to have been formed in the same way and under the same conditions as the pyrrhotite. It appears to be a primary constituent of the ore. Its formation seems to have depended on a deficiency in sulphur, the available sulphur being seized upon by the copper and going to form chalcocopyrite. On account of the variety of rocks in which the ores are found, it is evident that the source of the material veins cannot have been local. From the fact that the mineralized districts are much cut up by eruptive dikes, that areas of recent eruptions are close at hand, and vents from which the volcanic series were ejected were probably near by, and that magnetite has so far seldom or never been found to have resulted from the deposition of mineral-bearing underground solutions, while common in contact metamorphism and as the result of sulfatation action, it seems fair to conclude that the deposits have a connection with the recent eruptive rocks, and that at least some of the material was derived from the magma of the eruptives brought up by the after-actions characteristic of volcanism. This view is supported by the independence of the deposits with regard to the country rocks, the resemblance of some of their materials to that of nickel-pyrrhotite and other deposits considered to be the products of magmatic secretion, and others to the products of volcanic after action; at the same time it is not claimed that deep-seated under-ground circulating waters have had no share in the mineralization. Indeed, the mingling of solutions from the two sources may have had a marked influence in the precipitation of their mineral contents.

There have been considerable movements since the ore was deposited; numerous slips, some with gouge and

secondary filling, traverse the ore bodies. This broken nature of the ground, coupled with the original irregularity in the form of the ore body, makes the exploitation of the smaller deposits sometimes difficult and precarious. The slips so far encountered have not been sufficiently large to have seriously affected the large deposits. The serpentine is particularly full of slips, some prior, but many subsequent to the formation of the ores, which make it probably the least satisfactory country rock in the district.

The values in the ores are principally in copper and gold, sometimes with accessory silver. Further study is required to formulate the laws governing the distribution of gold values. Generally magnetite and pyrrhotite, when occurring alone, are almost barren, yet this is not always the case. Away from the chief centers of mineralization, while magnetite and pyrite are still sometimes found, the copper and gold are sparingly present.

A striking feature in the deposits is the lack of surface oxidation or alteration. At most, a few feet below the surface of the ground, the ore exhibits the same characters as are found in depth. The soil overlying a deposit is often quite unstained, offering no indication of the underlying ore, and consequently adding to the difficulties of prospecting. Sometimes the surface of the ore even retains the glacial polishing. The explanation of this feature is probably to be found in the heavy glaciation to which this region has been subjected.

In Copper camp oxidized copper bearing veins occur, forming at first sight a totally different type of deposit. One deposit is found at a contact between a dike of porphyry and crystalline limestone. Wedge-shaped tongues of the porphyry extend from the main dike into the limestone. Both the limestone and the dike are much fractured and traversed by little slips. These fractures cut the limestone into small blocks. In the limestone, and to a less extent in the fractures in the porphyry, along the contact, are deposited various oxidation minerals of iron and copper, including native copper. These embrace red, massive and earthy hematite and yellow limonite, crystallized malachite and azurite, a black amorphous substance, a mixture containing copper oxide (melanconite, lampadite and chalcocite), cuprite, often in transparent crystals, native copper, chrysocolla and probably copper pitchblende.

The edges of the small limestone blocks have often been dissolved, and

the copper ores then occur as encrustations surrounding a core of lime. The main fissures are filled with the iron and copper minerals, the smaller principally with the copper. In the porphyry it is only the fractures near the contact which contain a thin film of copper ore, the rock itself remaining fresh and unaltered. So that this type of deposit is probably an oxidized and secondarily enriched form of a sulphide deposit similar to the first type of Boundary deposits, and produced by the action of surface waters. The iron of the sulphides has been removed or re-deposited as hematite or limonite, the copper has been more or less concentrated in the form of various oxidized minerals. At greater depth the unaltered iron and copper sulphides will presumably be found, although between the oxidized minerals and the unaltered sulphides it is quite possible that a zone of enriched sulphides will be found.

The quartz veins constituting the third type of deposit are found in the neighborhood of the first type, but seem more abundant on the outskirts of areas of chief mineralization. They are sometimes parallel to the large sulphide bodies, but do not as a rule show the same regularity in their strike. In form they are more regular and they are usually enclosed between well-defined walls. Chalcopyrite, pyrite, arsenopyrite, galena and zinc blende are the chief metallic minerals. Tetraehedrite and some rich silver minerals are said to have been found in some of these veins. The principal values are in silver and gold. In age and mode of formation there may have been little difference between these and the previous deposits, though in that case they would probably represent the closing stage of mineralization.

Some of the practical deductions from an examination of the ore deposits may be summarized as follows:

Ores may be found in any of the older rocks where the other conditions for mineralization were favorable.

Districts which show evidences of late disturbances, through vulcanism, manifested by intrusions of recent eruptives and heavy diking, are promising fields for prospecting.

Limestone contacts in such areas should, in particular be carefully prospected.

Since, with the exception of certain deposits in Copper camp, there is no zone of oxidization, and secondary enrichment, in the main deposits, while the general conditions remain unchanged, no loss of values is to be expected in depth.

On account of the irregular form which the ore bodies may possess, and the complex nature of the rock formations, a careful and detailed study of the surface of the ground in the neighborhood of the mines would be of great practical assistance in the exploitation of the ore bodies. For the same reason development work must always be kept well ahead of the actual mining. Cross-cutting must frequently be resorted to, to determine the actual limits of the deposits, and to prove the existence or non-existence of parallel ore chutes. The limits of mineralization must be actually proved, and similarly that ore can be with certainty reckoned on, which has actually been blocked. In this connection diamond drilling can be used with advantage. Careful magnetic surveys would always be of great value in locating ore bodies under the covering of drift, and also for testing for ore in the mines themselves. Especially good results should be obtainable by this method in the magnetic type of deposit, but it should also prove successful in the pyrrhotitic deposits.

Where the ore occurs at a limestone contact the limestone wall may often be used for following the ore, it being kept in mind that the ore does not always follow strictly along the contact, and that the limestone may pinch out without causing the ore to likewise give out. The dikes in some cases may be used in the same way.

The pyrrhotite and magnetite should always be assayed, as a barren looking material may carry good values. The minerals in the ore and the conditions where pay values occur should be carefully studied with a view to ascertaining which carries the values, and what were the causes which produced the concentration of values.

The porphyry dikes, themselves, while not mineralized in the same way as the country rock, may in places prove auriferous.

In prospecting, it is to be noted that float may have been carried a considerable distance, even across valleys by the former glacier. The general course of the latter was about S. 30 deg. E., but it was influenced by the local topography.

In a promising deposit of the oxidized copper type, one would be warranted in testing the deposit to a sufficient depth to ascertain if a zone of enriched sulphides exists between the oxidized zone and that of the unaltered sulphides.

Below the limits of alteration, the deposit may or may not be rich enough to work.

THE GRANBY MINES, PHOENIX.

ORE SHIPMENTS NOW EXCEED 1,000,000 TONS.

THERE can be no question that the Granby mines, as the group of properties operated by the Granby Co. is called, have been practically the backbone of the Boundary country for the last several years. The reason for this is simple. The men who financed and operated the Granby mines foresaw the necessity of providing a large amount of capital from the outset, and they also perceived that only by working on an extensive scale could they extract profits from the low

men, paid out more money monthly, and accomplished more development, as well as having shipped more ore than all other mines in this section put together. And this is the condition today, when the properties have been brought to a dividend paying stage.

It is a well known fact that the Old Ironsides and Knob Hill mines were discovered and located on the 20th of July, 1891, by Matthew Hotter and

Times were hard in those days, and little was done to the now famous group of mines till John Stevens, who located the Victoria in 1894, one of the group, ran an open cut on the Knob Hill, showing what a tremendous proposition that was. Then Mr. White disposed of a half interest to Jay P. Graves, of Spokane, who organized the Old Ironsides Mining Co., with A. L. White. In after years the



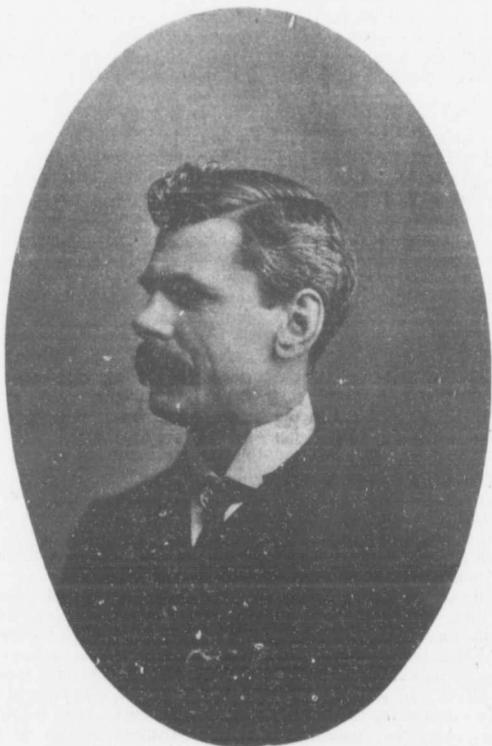
First Granby Mines Plant—capacity, two drills.

grade metalliferous Boundary ores. And so they proceeded along those lines, never hesitating or stopping for an instant for the last six years, or since they took hold of the properties, determined to make them what they are today, the largest copper-gold mines in the Dominion of Canada, if not in the United States.

In these years it can be said that the management has employed more



Bunk and Boarding House, Granby Mines, 1897.



WM. YOLEN WILLIAMS, SUPERINTENDENT GRANBY MINES.

Henry White, two prospectors, who were wandering through this region where there were neither trails, wagon-roads nor railways. Few mineral locations had then been made in the Boundary and these few had not been worked, except in the case of some high grade mines that would stand the long haul to a railway.

three other associated companies, the Knob Hill, Grey Eagle and Granby smelter, were formed, and about two years ago the four were merged in the present Granby Consolidated Mining, Smelting and Power Co., with a capital of \$15,000,000. Mr. S. H. C. Miner and associates in the Eastern Townships of Quebec, having taken a



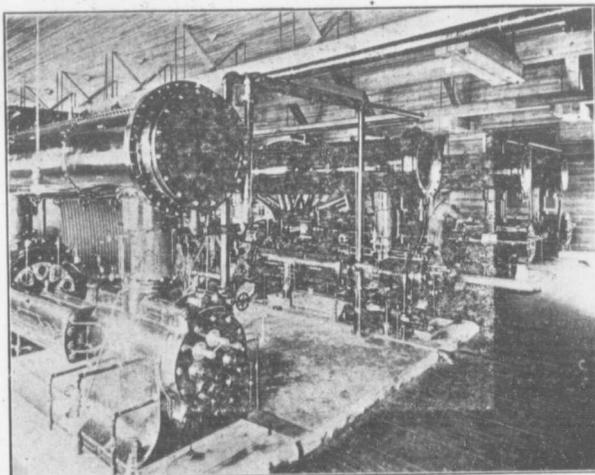
Officials and Directors of the Granby mines at the property, June, 1903. Reading from left to right: Clement, Hon. John, director; John Stanton, director; A. L. White, director; Wm. A. Payne, director; A. W. B. Hodges, smelter superintendent; Geo. Martin Luther, director; P. J. Dermody, foreman; J. B. Francis Herreschoff, director; Wm. Yolen Williams, mine superintendent; Jay P. Graves, general manager.

large interest in the original corporation, and furnished much of the funds with which the development was done. Previous to the formation of the present Granby Co. the capitalists interested were known as the Miner-Graves syndicate.

Mr. Graves began the work of development in the winter of 1865-6 on a small scale, but while the Crossland boom was on, and there was so much interest in the silvery Seeon, the low grade mines of the Boundary had few attractions for investors. However, in 1897 Mr. Graves concluded that the time had arrived for active and systematic work, and sent J. F. Hemmenway here with a force of men. One of those men was Patrick J. Dermody, then and now the foreman in charge. A few months later Mr. Graves sent Wm. Yolen Williams here to be the superintendent, which post Mr. Williams still holds, and also holds in a remarkable degree the esteem and confidence of the management as well as that of the 425 men under him in the mines. All of the extensive operations have been conducted by him up to the present, and the gratifying success of the entire gigantic project has been largely due to his wise direction of the immediate affairs of the development.

In the winter of 1897 the first steam power plant was installed at the Granby mines, having been hauled over poor wagon roads from the nearest railway station, Bossburg, Washington, some 65 miles distant. Compared with the magnificent plant now in use here, admitted to be the finest and larg-

est in use at any mine in Canada, this initial plant was certainly a small affair, but it answered the purpose for some time. In 1898 the first half of a 10-drill air compressor was put in, and development went ahead faster after that.



Granby mines—interior view of new 60-drill air compressor building.

The second half was soon added, and in 1900 a ten-drill plant was purchased for the Knob Hill.

In 1903 the present superb equipment was installed, being two 30 drill Rand compressors, driven by electric power, which is delivered a distance of 22 miles from Cascade, on the Kettle

river. These huge machines are operated by two 750 h. p. electric motors of the Westinghouse type, which are also the largest of their kind in the Dominion. This compressor plant furnishes all the power needed for the extensive operations at the mines, including pumps, hoists, drills, machine shops, sawmill, etc. That the plant of machinery is complete in every respect, goes without saying. In every possible way economy of operation—the greatest desideratum of all in wresting values from low grade ores—was the watchword. Labor saving machines of the most practical type were introduced and used to the best advantage, one after another, the safety of the men employed by Superintendent Williams being always the first consideration, no matter what the cost.

In the month of July, 1900, the first ore train was sent down to the company's smelter at Grand Forks, then just finished with two furnaces. At first the ore shipments were at the rate of about 350 tons daily, but were shortly increased to 700 tons per day. The next year two more furnaces being added to the smelter equipment, the shipments were again increased to some 1,400 tons daily. This rate continued for a year or two, and in the meantime

the smelter equipment was again being augmented. After many delays, last fall six blast furnaces began the work of reducing 2,000 tons of Phoenix ore per day, which rate is now being maintained steadily. The machinery plant has a capacity of getting out 5,000 tons of ore daily.

Ore shipments from the Granby mines for the last four years have been as follows:

1900.....	64,533 tons
1901.....	231,762 tons
1902.....	309,858 tons
1903.....	393,718 tons

Total..... 999,871 tons

Some figures of actual work done, in lineal feet, may be of interest. Up to December 31, 1903, the development in the Granby mines was as follows:

Sinking and raising..	4,833 feet
Drifting, crosscutting	15,935 feet

Grand total, ... 20,768 feet

It is probably a fact that no mining company in British Columbia is constantly adding to and bettering its equipment more than the Granby Co. The necessity of saving every few cents possible on each ton of ore sent to the smelter, on account of the low grade of the ore, has brought economies that have heretofore been unthought of in the history of mining, at least in this province. Going more into detail as to what has been done by this company in the last year, the following may be mentioned:

New machinery installed during the year includes two Rand class D cross-compound duplex air compressors, electrically driven and connected to motors by rope drives, high-pressure cylinders 16x36 inches, low-pressure cylinders



Present Granby boarding house—electric lighted and steam heated.



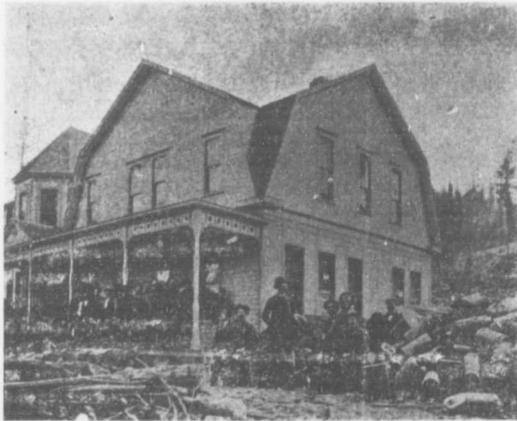
Granby dining room.

28x36 inches, rated capacity together, 8,228 cubic feet of free air per minute, or 60 3/4 inch machine drills; two 700 horse power type C. Westinghouse induction motors, to operate compressors; one type No. 1 Thew automatic, single-truck steam shovel, rated capacity 500 to 750 cubic yards in 10 hours, built by the Thew Automatic Shovel Co., of Lorain, Ohio; one type No. 3 Thew automatic single-truck steam shovel, rated capacity, 1,000 to 1,500 cubic yards in 10 hours, and two 9x14 saddle tank locomotives, built by the Davenport Machine Works, Davenport, Iowa, for hauling the mine ore cars.

This machinery has cost the company something like \$150,000 alone, and is constantly being added to. It is all of the most modern and approved manufacture, and calculated to materially assist in the reduction of costs in the production of ore.

Some of the prominent features recently introduced in the Granby mines were as follows:

The almost entire substitution of electricity for steam power for the operation of the machinery; the effective working of the big style B. Farrell ore crusher, which has jaws opening 42x32 inches, and a capacity for crushing rock to a size of 7 or 8 inches at the rate of 150 tons per hour, and the provision of the adequate power the two 30-drill air compressors supply for mine purposes. The company is steadily working in the direction of obtaining the larger proportion of its

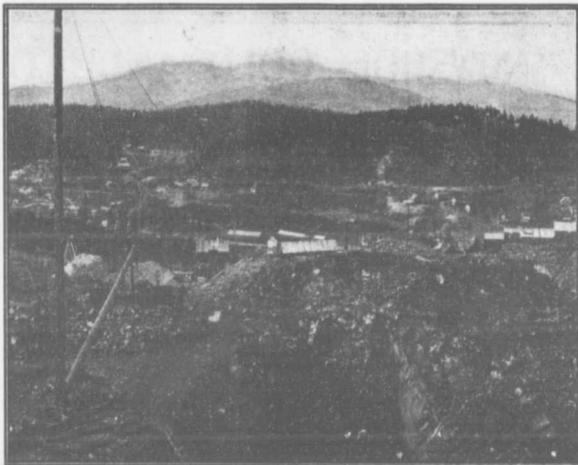


Old Ironsides boardinghouse, now adjunct of Granby boarding house.

ore by quarrying and tramping through the tunnels rather than by hoisting from the lower levels, thus reducing mining costs. At the present time the three steam shovels (a third steam shovel, rented from the C. P. R., is also in use in the quarries) are handling about one half of the ore output, and the question of their use in the underground workings is now under consideration, with a view to determining their practical use in the extensive tunnels and stopes.

As to the size of the ore bodies in Granby mines, several statements have been published, and while not always official, it is hardly too much to state that most of them, large as they appeared, were probably not exaggerations. When it is said that there are 50,000,000 tons of ore, the boundaries of which have been explored, the figures seem almost incomprehensible, yet mining men conversant with the conditions have made statements even broader than this. It can readily be seen that at the present rate of 2,000 tons of ore daily for shipping and smelting, this ore body will last for many, many years. Then the company has announced its intention, some time, of driving a long and deep tunnel, to reach the ore bodies at a depth of upwards of 1,500 feet, thereby opening up untold millions of tons more.

In closing this all too brief review of the conditions at the Granby Mines, mention may be made of the arrangements made by the company to take care of its mine employees. Before the city of Phoenix had its being, the Old Ironsides hotel was built, and,



Tramway pits, Granby mines looking north to ore crusher.

being found too small, the Granby hotel, a three story modern structure, with accommodations for nearly 300 men, was also constructed. This latter building, like everything done by the Granby Co., is probably the best structure of its class in the province. Costing about \$30,000, it is electric lighted and steam heated, and the comforts of the men are cared for in far better shape than in the majority of mine "bunk houses," as they are usually called. This the testimony of the men themselves, and is to the credit of W. S. Macy, who has charge of the two "bunk houses," and who has been conducting them for the last three years.

Officials of the Granby Co.

The full list of officials of the Granby Co. is as follows:

S. H. C. Miner, of Montreal, president; Jay P. Graves, Spokane, Wash., vice-president and general manager; A. C. Flumerfelt, Victoria, B. C., assistant to the president; H. N. Galer, Grand Forks, B. C., assistant general manager; G. W. Wooster, Grand Forks, B. C., treasurer; R. R. Macaulay, Montreal, secretary; Wm. Yolen Williams, Phoenix, B. C., mine superintendent; A. B. W. Hodges, Grand Forks, B. C., smelter superintendent; Directors: S. H. C. Miner, Jay P. Graves, John Stanton, William H. Nicholls, A. C. Flumerfelt, A. L. White, W. A. Robinson, Jacob Langeloth, J. H. McKechnie, Geo. Martin Luther, Fayette Brown and C. S. Houghton.

On the 16th December, 1903, the Granby Co. declared a dividend of one per cent on the issued shares of the company, which is the equivalent of ten per cent on the selling price of the shares, the amount disbursed at that time being \$133,630. It is the expectation to distribute dividends of a like size quarterly. This is not only the first dividend declared by any company operating on low grade ores, but probably the largest declared by any mining company in British Columbia.

The group of mineral claims now known as the Granby mines consists of a block of ten claims, as follows: Old Ironsides, Knob Hill, Victoria, Phoenix, Fourth of July, Aetna, Grey Eagle, Banner, Tip Top and Triangle fraction, all adjoining, and lying to one side of as well as in the heart of the present city of Phoenix.



Steam shovel at work at Knob Hill mine.

SNOWSHOE GOLD AND COPPER MINES.

Owned and Operated by English Capital.

ONE of the mining properties of great promise in the Boundary, that has been steadily operated on for the last five years, is the Snowshoe—owned and developed entirely by English capital. It is also one of the groups that was steadily and systematically developed for a long time before much was heard of it, although now it may be classed as one of the several largest mines of this section.

This group comprises the Snowshoe, Pheasant, Alma fraction and Fairplay fraction mineral claims, being located within ten minutes' walk of the Phoenix railway station. The principal claim of the group, and the one on which most of the development has been done, is the Snowshoe. This claim was originally located in 1891, and later relocated. Then Patrick Clark, the Spokane mining operator, took a bond on the property, but failed to do sufficient work thereon to prove its value. On the recommendation of J. W. Astley, M. E., a bond was finally taken on the Snowshoe by the British Columbia (Rossland and Slocan) Syndicate, Ltd., and that concern, with Anthony J. McMillan as managing director, at once entered upon a long period of development, practically bringing the mine to the condition it is in today—where it has ore bodies of sufficient size to permit of the property shipping 500 or more tons per day for an indefinite period, a number of years at least.

After the British Columbia (Rossland and Slocan) Syndicate, Ltd., had performed about \$130,000 worth of development work, from 1899 to 1901, the Snowshoe Gold and Copper Mines, Ltd., was organized in London to take over the group and operate the same. This company was organized by the promoters of the old syndicate, and was floated without trouble. The chairman is the Earl of Chesterfield; vice-chairman, George S. Waterlow, Esq.; managing director, Anthony J. McMillan; superintendent, J. W. Astley. Mr. Waterlow, who is a son of Sir Sidney Waterlow, is one of the best friends that this district has in England. Mr. McMillan has been identified with the Snowshoe from the time of the in-



GEORGE S. WATERLOW, ESQ., VICE-CHAIRMAN.

ception of development work, and Mr. Astley likewise. Mr. Astley has had some seventeen years' experience as a mining engineer in the United States and Canada.

The tonnage of ore shipped from the Snowshoe for the last four years, the product going mostly to the Boundary Falls and Greenwood smelters, was as follows:

	Dry Tons
1900.....	297
1901.....	1,731
1902.....	20,800
1903.....	71,212

Total shipments of ore... 94,040

All the Snowshoe ores carry gold and copper, the copper either sprinkled freely throughout, or more generally disseminated in fine particles. The ores vary in character, the gangue being sometimes a silicious, sometimes calcareous, while again it is magnetic or specular hematite. In parts of the property the several varieties occur in quite distinct bodies and in others they are mixed.

Development work during 1903 included about 700 lineal feet of driving, cross-cutting and raising, and the sinking of the main three-compartment incline shaft another 50 feet, making its



SNOWSHOE TUNNEL.

depth 350 feet. The total of development work is now 7,010 lineal feet. A considerable amount of surface stripping was done during the year, and stopes were opened up and tinkered on the different levels. Ore was extracted from what is known as the Tunnel or No. 1 level, the 200-foot and 300-foot levels, and from several ore quarries opened from the surface. The mine is now in excellent condition, with numerous ore faces accessible, workings conveniently arranged, power equipment adequate, and ore bins and trackage provided, so that a daily output of 600 tons can be maintained. Some 60 to 100 men have been regularly employed at the mine.

The improvements and additions to machinery, plant

and buildings during the past year included the completion of ore bins with a capacity of 2,500 tons, building of head frame and skipways, and the installation of a 150 horse power double conical-drum electric hoist with motor to operate it, and another steam boiler, 150 horse power, high pressure. The hoist has been run since last June by electricity, the current having been supplied by the Cascade Water, Power and Light Co., which also supplies power to the Granby company's mines.

The power plant of the mine, a year ago, included two steam boilers, two air compressors together rated at about 12 drills, machine drills, hoisting engine at the shaft, and an auxiliary hoist in the tunnel, steam pumps, etc. In 1903 the first half of a Rand Corliss 30-drill air compressor, to have a working pressure of 125 lbs., a combined machine to be driven by either steam or electricity, and two 80 horse power horizontal return tubular boilers, with a working pressure of 150 lbs.



ORIGINAL SNOWSHOE CABIN.



SNOWSHOE ELECTRIC HOIST—LARGEST IN THE BOUNDARY.

(those hoists being the first of this class to be brought into the district) have been supplied by the Jencks Machine Co., of Sherbrooke, Que., in addition to electric hoist and 150 horse power boiler heretofore mentioned, installed in 1903.

On the 16th of December, 1903, operations at the Snowshoe were suspended, pending the completion of details of an amalgamation plan with the British Columbia Copper Co., owning and operating the Mother Lode mine and smelter, the Snowshoe having heretofore been shipping to customs smelters, which did not prove to be satisfactory to the management. The details of amalgamation of the two companies are expected to be ratified at meetings of the shareholders of both to be held this month. It is proposed to have the assets of both concerns taken over by a new English corporation with a capital of £1,000,000, both of the old corporations being represented on the new board of directors.

When this is finally done it will make one of the strongest companies operating in the Boundary, having ample ore supplies, and with an up to date smelter and converters for the manufacture of copper.

In addition to the excellent equipment of machinery for the Snowshoe, the management has provided excellent boarding and bunk houses for the employees, as well as residences for the superintendent, Mr. Astley, and foreman, Mr. Trevorrow. With the C. C. R. running across the property, already having built three sidetracks on the Snowshoe ground, and the survey for the branch of the Great Northern to Phoenix doing the same, the Snowshoe is in the best of positions as far as transportation facilities are concerned.

At the second annual meeting of the Snowshoe Gold and Copper Mines, Ltd., held in London a year ago, the directors presented reports that contain many interesting facts. Mr. Waterlow, Mr. McMillan and Dr. Jones have visited the Snowshoe several times, and are thus intimately acquainted with the plan of development that has been carried forward. At the meeting referred to, the chairman, the Right Hon. the Earl of Chesterfield, had the following to say:

"It gives me great pleasure to be able to state that, since the formation of the company in June of last year, development work has been vigorously prosecuted, and, as a result, further large bodies of ore have been opened up. At the present time the mine is shipping some 200 to 250 tons of ore per day, and very shortly, when the electric hoist at the main shaft, and the new railway spur to the lower tunnel are finished, it will be in a position to ship 500 to 700 tons of ore per day. I may say the ore is being mined in the most economical manner.

"I mentioned last year that electric power would be brought up to the mine by the Kettle River Power Company, from Cascade City. This is now practically accomplished, and we have made a contract with that company to run the hoist, which is now being installed.

"I have stated that we are hoping to effect greater economies at the mine by obtaining from the Canadian Pacific Railway further reductions in our freight rates, and we have also been strongly urging upon the ministers of the government the desirability of abolishing the unjust tax of 2 per cent, now levied on the gross output from the mine after freight and treatment charges have been deducted, pointing out



ANTHONY J. McMILLAN, MANAGING DIRECTOR.

that if taxation of this kind is to be levied at all, it should only be upon dividends declared.

"You will remember that it was only in June of last year that the company was formed, and I am satisfied that you will feel that since then excellent progress has been made, and that great thanks are due to the managers and those who have carried out the work—such as Mr. Astley, our resident engineer; Mr. Trevorrow, our foreman; Mr. Tomlinson, our bookkeeper; and Mr. Bannantyne, our surveyor.

"It is no wish of mine to make any invidious distinction, but if I single out our deputy chairman, Mr. Waterlow, my co-directors will not, I trust, feel any pangs of jealousy. If I may be allowed to say so, the Snowshoe mine is the infant of Mr. Waterlow. He has watched over it and tended it, and he has at various times spent days and weeks and months, not alone in this country, but on the mine itself and in other parts of Canada, working on

behalf of the shareholders to ensure the success of the undertaking. It is my hope, as well as it is my conviction, that these worthy efforts of his will shortly be crowned with the success they certainly merit.

"In conjunction with Dr. Lewis Jones, one of your directors, Mr. Waterlow spent some two or three weeks at the mine this last autumn, and I feel sure that both these gentlemen will be able to give you today, as eye-witnesses, a most interesting account of the present position and future prospects of the property.

"Of our managing director, Mr. McMillan, it would be impossible for me to speak too highly, and the shareholders are to be most sincerely congratulated on having a gentleman of such energy, of such capability, and, above all, so highly respected in British Columbia, to watch over their interests during the many months of the year in which it is his lot to reside at or near the Snowshoe mine, and also in London.



Snowshoe Mine—Quarry ore broken through to upper raises.

"We are convinced that before long we shall be able to prove to the investing public of this country that by honest, judicious, economical and sound management there are mining enterprises in the vast regions of British Columbia well worthy of the attention of the investor, and further, that there are in that country capabilities and possibilities hitherto little realized or appreciated, which must in time to come, and on their merits, attract the notice of the English capitalist."

Mr. Waterlow then said:

"After the lucid remarks that have fallen from the chairman there is but little for me to add; no doubt, however, you will be interested to hear something of my last visit to British Columbia and other parts of Canada, when I spent a considerable time—something over a fortnight—on the Snowshoe mine. Before proceeding I should like to say how much I appreciate the remarks Lord Chesterfield has made concerning myself—remarks too flattering in their nature—and to add that it is a pleasure to me to work with colleagues such as I have on the Snowshoe board.

"On approaching the mine, through which the Canadian Pacific Railway runs, I was immediately struck with the great progress that had been made there since our last visit. The surface works were spread out before me, shewing the stripped ground with the ore quarries and the new buildings that had been erected.

"When visiting the surface workings of the mine—accompanied by Mr. Astley, our superintendent and engineer—I was much impressed with

the excellent arrangements, and the economical manner in which Mr. Astley was mining the ore by means of blasting in open quarries; certainly the most economical method of mining in the world. While speaking of Mr. Astley, I might say that he is very conservative in his statements with regard to possibilities, and I am convinced of this, that we have in him a superintendent of the utmost integrity and of the greatest reliability.

"Should you visit the mines yourselves, you could not help being impressed with the large bodies of ore which are already shown up both on the surface and underground. Our mine, of course, is comparatively in its

infancy, compared to the mine above us known as the Knob Hill and Old Ironsides, and belonging to the Granby Company. It is not above 1,000 yards or so from the Snowshoe, but, working for a much longer period, they have exposed bodies of ore that are stated to be a mile in length, and embrace, so it is said, a tonnage of seventy million tons.

"We have made a contract for electric power with the Kettle River Power Company, whose works are situated on the waterfalls at Cascade, B. C. Dr. Jones, Mr. McMillan, your managing director, and myself, during our stay in the neighborhood, visited and inspected these works for the transmission of electric power, their line already being erected through the Snowshoe to the Granby mines and Phoenix.

"During my visit to the Snowshoe, several representatives of the British Press, who were making a tour through Canada under the auspices of the government, paid a visit to the Boundary district. They were shown over the mines of the district, including the Snowshoe mine, and afterwards we entertained them to luncheon at our boarding house, with many of the leading municipal representatives of the district. They were very much impressed with the great possibilities of these mines, and with the immensity of the ore bodies in the neighborhood.

"I should like to assure you that I am convinced that in the Snowshoe mine you have a property capable of a great future; good honest men working in its interest; and a very cautious engineer in stating its possibilities. And I cannot conclude these remarks without expressing how much we are



Snowshoe Mine—Ore quarry, showing mouths of raise.

indebted to our managing director, Mr. McMillan, for the way in which he has worked for our interests, as both in British Columbia and other parts of Canada and in London he has unceasingly and untiringly devoted himself to the interests of this company. He is well-known all over Canada, and is one of the best known men in British Columbia, and we are very much indebted to him for the able way in which the management has been carried out on the Snowshoe mine.

"It may interest you to know that we have recently received an offer from certain mining men in America who wish to purchase our property upon a basis of over a million tons of ore in sight. This is not the first offer we have had for the Snowshoe property. I think that you may feel that the tonnage mentioned is not over estimated, and that a great deal more will be found; that the mine will last for many years, and that under the present conditions of management you will find that you have a sound and profitable undertaking."

Dr. Jones said:

"In supporting the adoption of the report and accounts, I wish to say a few words on behalf of my co-directors and myself about the treatment of the Snowshoe ore. The expenses of operating a mine consist largely of two chief items, the cost of extracting the ore from the ground, and the cost of extracting the metals from the ore. When several hundred tons of ore are raised from the mine every day, the saving of even a shilling a ton in its treatment is an item, and the choice of a suitable and cheap metallurgical process becomes very important. It has been our special care to investigate a large number of proposed methods of treating the Snowshoe ore.



MR. J. W. ASTLEY, SUPERINTENDENT AND ENGINEER.

"We are happy to say that we are now getting our ore treated at a rate which is extremely low compared with costs of treatment in other places, and I think it a most striking fact that smelting is done as cheaply, or more cheaply, in the Boundary district of British Columbia than anywhere else in the world. Still, the smelter company has to make a profit, and does so, from every ton of ore it receives, and now that the reserves of ore in the mine have been shown to be of great magnitude, the question of the company's owning and operating its own reduction works becomes of prime importance, not only for the sake of economies, but also because of the advantage of having no conflict between the mine and the smelter interests."

From the foregoing it will readily be noted that, as a result of the steady development of the Snowshoe mine, and taking into consideration the returns received from the 94,000 tons of ore so far shipped to the district smelters—which, after all, is the true test of a mine—the London shareholders of the Snowshoe are justified in having the greatest confidence in the property. They have spared neither money nor energy to bring the mine up to its present condition—a condition that bids fair to make it even better known in England than it is today. After operations have been resumed for a time, there is every probability that the shareholders of the Snowshoe will begin to receive profits from their heavy investment, and if the extensive tonnage of ore now exposed can be used to judge from, these profits should continue for a long time to come. Those in the best position to judge believe that this will be the case at no distant date.



MR. J. W. ASTLEY'S RESIDENCE.

The City of Phoenix.

Location of Boundary's Greatest Ore Producers.

WHEN the historian of the future comes to write of Phoenix camp, he will find here much food for thought. He will wonder how such a thriving community could grow to its evident importance in less than five short years—from a literal howling wilderness, nearly 5,000 feet in the clouds, to a well built little town with nearly all modern conveniences. But if he looks deeper he will find the reason—the mammoth ore bodies of the greatest of Boundary mines literally underlie the city itself.

When the importance of this point first began to dawn on the minds of the early prospectors and settlers, the first thing they asked for was a post-office. A petition was sent in to the Dominion government in June, 1888, to call this place Brooklyn, but as there was already a Brooklyn on Lower Arrow Lake, now, however, long since dead, with the passing of railway construction, the name was finally changed to Phoenix, after one of the claims of the present Granby group of mines. Thos. Roderick was the first postmaster, the office having been established in the fall of 1888. This position Mr. Roderick occupied for something over a year, when he resigned, and the present incumbent, D. J. Matheson, received the appointment, which he has so well filled.



Phoenix in 1895, then known as Greenwood Camp—original cabin in foreground.

With the growth of development, the coming of the then new Boundary branch of the C. P. R., and the general influx of population, the little town of Phoenix also flourished and waxed fat, to the surprise of the oldest inhabitants of this section.

Business houses sprang up on every side, and almost all lines were represented. An active board of trade was also established that did yeoman work for the good of the community.

In the summer of 1900 agitation was started for incorporation, resulting in the forming of the present municipality of the city of Phoenix in October of

that year. The first mayor was G. W. Rumberger, who has been elected to succeed himself each year since, the year 1904 being no exception. Mr. Rumberger might be called the father of Phoenix, having been here since the summer of 1891.

Rumberger's sub-division of Phoenix was placed on the market in the early fall of 1899, and every desirable lot was sold before the property was platted. This was followed a couple of months later by the platting of the Old Ironsides sub-division, the property of the present Granby Co., which was the occasion of one of the most remarkable realty sales ever held in this province. The day of the opening not a business lot was unsold, and many who came hundreds of miles to secure some of this valuable real estate, went away disappointed. It is said that about \$100,000 was realized by the Miner-Graves syndicate at that sale, or enough to pay for a large part of the initial installment of the company's smelter at Grand Forks.

In the summer of 1901 the Dominion Copper Co's addition to Phoenix was platted, making the connecting link between what had been known as the upper and lower towns. This summer also saw many municipal improvements, streets graded, sidewalks built, and a franchise granted for water and light systems. Both of the latter have since been carried out, giving the city a modern service that was much needed. Electric light is furnished



Original cabin of Phoenix, with some of the oldtimers.



ALDERMAN JAMES MARSHALL.

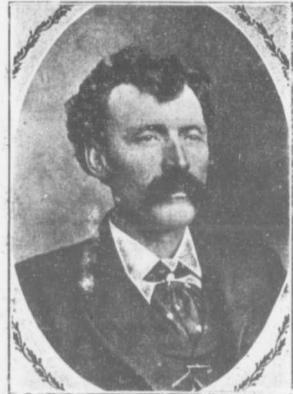
by the Phoenix Electric Lighting Co., Ltd., the power being furnished from the falls of the Kettle river at Cascade, 22 miles distant in a direct line. The same company put in the water system, giving the city excellent domestic service and fire protection.

Each year has seen a steady growth in the city of Phoenix, although the so-called boom element has long since dropped out. Like all new places, too many business houses were established here at first, a matter, however, that regulated itself in time. At the present, and for the last two years, general business has been on a substantial basis, and moderate prosperity has been the rule, with some advancement each twelve months.

In the early days of Phoenix, pessimists were not lacking, who asserted that the grade of the ores of this camp was so low as to preclude profitable

working. All of these persons have, however, been put to rout recently by the payment of the first dividend, else where referred to in this issue, by the largest of the companies operating in the Boundary. The very fact that the ores were low grade has been a benefit to Phoenix, as it meant that for a given amount of gold, silver and copper extracted from mother earth here, a larger number of men were necessarily employed—a condition vastly different from high grade camps.

As a result, the payroll of the mines contiguous to Phoenix has steadily grown each year, and now reaches the respectable total of from \$35,000 to \$50,000 per month. For the information of the distant reader, who does not understand the local conditions, it may be said that the following proper-



ALDERMAN ALEX. McDONALD.



MAYOR G. W. RUMBERGER.

district. Nor have the managers of Canada's greatest railway been disappointed. For more than two years last past the freight account of the Granby Co., operating in this camp, has averaged over \$1,000 per day. If there were 85 more concerns that had as much, the sum total would equal the entire receipts of the C. P. R. from all sources whatever for a year. From Phoenix roads and trails radiate to the different mining camps, giving good connections in that manner.

Social conditions are not overlooked in Phoenix. The following fraternal and beneficiary organizations have lodges here: Masons, Knights of Pythias, Independent Order of Odd Fellows and Fraternal Order of Eagles, all of which are in a flourishing condition. Besides there are a miners' union, carpenters' union, white cooks and waiters' union, labor union, etc.



ALDERMAN L. V. BIRNIE.

ties are either in or close to Phoenix: Granby group, Brooklyn group, Gold Drop group, Snowshoe group, War Eagle group, Althelstan, Golden Crown, Winnipeg, Hartford and other Wellington camp mines, besides a larger number for which we have not room here to mention. Not all of these are at present active, but all have good showings, and time will show their worth. The larger and more important properties now working are treated of in other pages.

By reference to the specially drawn map in this issue, it will be noted that Phoenix is the most centrally located camp in the Boundary. When the C. P. R. was built into the Boundary, Phoenix was the chief objective point of the line, for here was expected to be had the greatest tonnage of the



ALDERMAN W. J. PORTER.

McRAE BROS. & SMITH,

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 BOOKSELLERS
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 FANCY GOODS
 CIGAR, TOBACCOS
 CONFECTIONERY
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 INSTRUMENTS
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 IN
 GREENWOOD

FULL STOCK CARRIED IN ALL LINES

Knob Hill Ave.

Phoenix, B. C.

INTERNATIONAL COAL AND COKE STOCK

Will make you 50 per cent on
 your investment in twelve months
 Ten per cent Dividends in eight-
 teen months.

Call on or address
 J. L. MARTIN,
 Phoenix, B. C.

ALBIN'S NEWS DEPOT

Cigars, Tobaccos, Confectionery,
 Stationery and Periodicals.

Dominion Ave.,

Albin Almstrom, Phoenix, B. C.



DOCKSTEADER BROS.,

CITY TRANSFER LINE

LIGHT AND HEAVY DRAYING
 OF EVERY KIND

LEADING
 WOOD MERCHANTS

Stables at foot of Dominion Ave.

Phoenix, B. C.

P. O. Box 269.

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McINTYRE & McDONALD,

PROPRIETORS OF THE

PALACE - STABLE

Centrally located in new quarters, with a
 complete outfit of carriage and saddle
 horses. Parties driven to any part of the
 Boundary or Similkameen on short notice.

CORNER KNOB HILL AVE.
 AND CHURCH ST.

PHONE
 NO. 34.

Phoenix, B. C.

HOTELS Summit,
KNOB HILL AVE.
Brooklyn,
DOMINION AVE.

PHOENIX, B. C.

Are probably the best known hostleries in the largest mining camp in the Boundary.

THIS PROMISES

To be the most prosperous year in the history of the Boundary.

When You Visit Phoenix, Remember our Latch-string Hangs on the Outside.

MARSHALL & SHEA, - Proprietors.

CENTRAL
» **HOTEL**

OLD IRONSIDES AVE.
and SECOND STREET,

Phoenix, B. C.

Nearest first class hotel to C. P. R. station, and nearest to the Granby mines.

Building well arranged for the comfort of Guests, and the bar stocked with the choicest.

FRANK ANDERSON,
Proprietor.

Bellevue
Hotel

FOR MORE THAN FOUR YEARS

THIS HOTEL has catered to the public, and has enjoyed a goodly share of patronage. It is more popular than ever today, and is better prepared than ever to cater to the wants of the travelling public. First-class Dining Room, and a Well-stocked Wet Goods Department.

GREIGG & McDONALD,
Proprietors,

Knob Hill Ave., PHOENIX, B. C.

BLACK'S : HOTEL

DOMINION AVENUE,

Phoenix, . . . B. C.



Commodious Sample Rooms
First-class Dining Room in connection
Bar well stocked with choicest goods
Most conveniently located



Telephone No. 26.

W. S. DOYLE, - Proprietor.

In church organizations the city of Phoenix is well up with the times. The first to organize here were the Presbyterians, who now have a comfortable edifice, located in the centre of the city, with Rev. E. C. W. MacColl as pastor. The Church of England also has a good mission house, with Rev. Wm. Wood as missionary. An energetic organization is that of the Methodists, with Rev. Thos. Green, B. A., as clergyman, who expects to build a church this year. Last fall the Roman Catholics erected a neat church, Rev. Father J. A. Bedard, B. A., being in charge. The Congregationalists also have a good church building here.

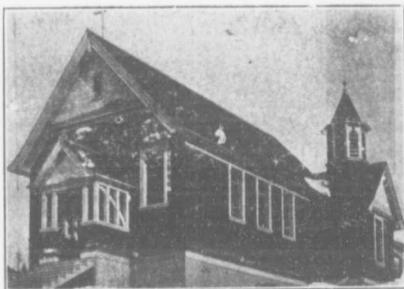
For two years past the Vancouver, Victoria and Eastern Railway and Navigation Co. has had surveys completed for its line from Grand Forks to Phoenix. This is a branch of the Great Northern railway, and as latterly the right of way for the line has been purchased to and through Phoenix, the year 1904 is expected to see it completed this far, giving this city connections with the two greatest transcontinental railway systems.

The public school system in Phoenix is excellent, with Principal Thornber in charge. An illustration shows the first log school house in Phoenix, built by public subscription. At that time the building was used for two or three different church services, and other purposes. The building now in use was erected by the government a couple of years ago, and while well arranged and commodious, is already being outgrown by the increasing number of



PHOENIX GENERAL HOSPITAL.

scholars in attendance. The total enrollment now exceeds 100 pupils.



PHOENIX—ROMAN CATHOLIC CHURCH.

One of the institutions of Phoenix to which the residents can point with

no little pride is the Phoenix General Hospital, which was incorporated under the Benevolent Societies' Act, of British Columbia. The hospital receives a small per diem from the government, being as the name implies, a general hospital, and is un denominational. The present commodious building, shown in the illustration, which is but one wing of the entire hospital when completed according to the plans prepared, with its furnishings, has cost about \$8,000, and while still in need of many appliances, has done a remarkably good work in the year and a half that it has been completed and in operation. In that time several lives have been saved that would undoubtedly have been lost had it been necessary to remove patients to hospitals at a distance.

The main support of the hospital comes from physicians who send contract patients from the mines, when ill or injured, and from public donations. The hospital has an experienced matron in Miss Johnston, a graduate of the London hospitals, assisted by a most capable staff of nurses. The president of the hospital board is A. C. Flumertelt, a gentleman who has made a study of this work for years, and who takes great interest in the good work that such institutions do. J. L. Martin, the efficient secretary-treasurer of the board of trustees, devotes a large part of his time to the needs of the institution, and takes great pleasure in acknowledging contributions or donations. It is not too much to say that no city in the interior of British Col-



PHOENIX—VIEW FROM LOWER TOWN.

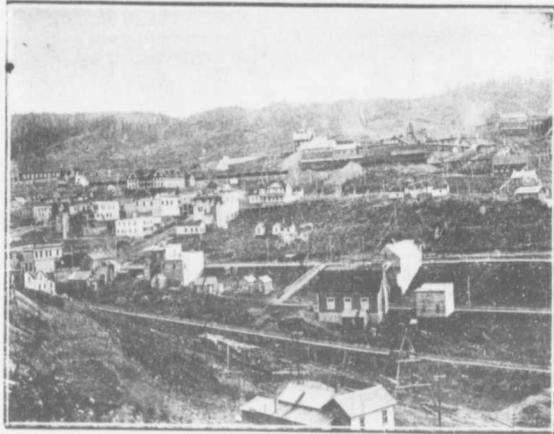
umbia has a better conducted hospital, with a better staff of nurses and physicians than has Phoenix.

Mention should also be made of the Hospital Ladies' Aid Society, an efficient organization, composed of most of the women of Phoenix, who have taken a active part in raising funds for needed equipment for the hospital. The building itself is situated on a slightly hill overlooking the city, and is of course electric lighted and steam heated.

Phoenix has a chartered banking institution, a branch of the Eastern Townships Bank being located here. Nearly every line of business is represented here at present, the legal and medical professions not being overlooked. In telephone service, besides being connected with the Kootenays and Boundary towns in this way, this place enjoys the distinction of having the only telephone exchange in the interior that is built on the latest metallic circuit plan.

According to the Dominion census of 1901, the population within the limits of the corporation of the city of Phoenix was 866. This did not take in any of the mine boarding houses, however, and in the vicinity of the city there are from 300 to 500 more.

For the year 1903, the councilmen of Phoenix were James Marshall, W. J. Porter, Alex. McDonald, L. Y. Birnie, M. H. Roy, and James Riordan, the latter two having resigned, however, during the year on account of having lost their property qualification. For 1904 the full board of aldermen is James Marshall, W. J. Porter, William



PHOENIX—CENTRE VIEW FROM STEFWINDER MINE.

Delahay, J. B. Boyle, A. S. Williamson, and Alex. McDonald. G. W. Rumberger is assessor and collector; C. H. Flood is chief of police, T. B. Kerr, city solicitor, and V. R. Williams, police magistrate.



PHOENIX—ORIGINAL LOG SCHOOL HOUSE.

In one respect Phoenix has been fortunate among the mining cities of British Columbia, in that it has no bonded indebtedness whatever, the affairs of the corporation being conducted in an economical and careful manner from the beginning of the city's municipal life. The city owes \$8,000, which amount and more was expended in public improvements, and this is steadily being paid off. The income from realty taxes and traders and other licenses, etc.,

is amply sufficient to pay the comparatively small running expenses of the city and leave a balance. But few cities in the interior or on the coast are in as good financial condition as Phoenix.

berger was re-elected mayor again this year. D. J. Matheson is city clerk,



PHOENIX—GENERAL VIEW OF GRANDBY MINES.

Boundary Elevations.

Boundary	Elevations.
Cascade	1,587
Christina Lake	1,595
Deadwood Camp, Mother Lode	3,450
Eholt	3,090
Grand Forks	1,710
Greenwood	2,400
Hartford Junction	4,300
Long Lake	3,700
Midway	1,913
Phoenix, Old Ironsides	4,625
Robson, Columbia river	1,419
Summit Camp, Oro Denoro	3,400
Summit Camp, B. C. mine	3,800
Wellington Camp, Winnipeg	4,425
White's Camp, City of Paris	4,130

MOTHER LODE MINE AND SMELTER.

Owned and Operated by the British Columbia Copper Co., Ltd.

AMONG the largest concerns operating its own mine and smelter in the Boundary country is the British Columbia Copper Co., Ltd., the latter adjoining the city of Greenwood, and the former being located some three miles west of the smelter, in Deadwood camp. The Mother Lode mine was located on May 28, 1891, a couple of months prior to the location of the large mines in Phoenix camp.

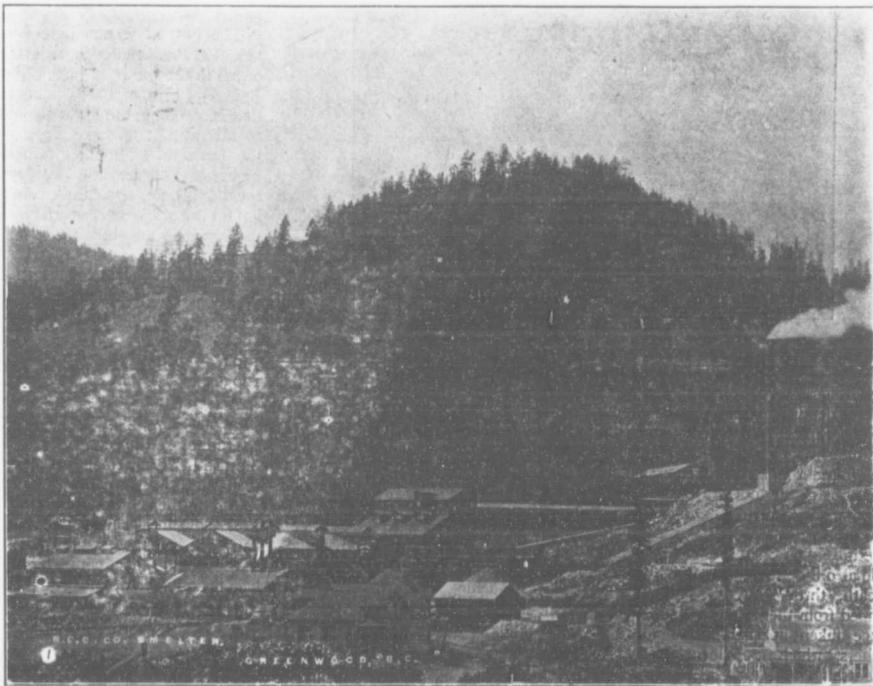
operate the Mother Lode and adjoining claims of that group. The company now owns the Mother Lode, Primrose, Offspring, Ten Broeck, Sunflower and Don Julio mineral claims, which are conveniently located for the most advantageous working.

The capital of the British Columbia Copper Company was increased to \$2,000,000 in 1902, in shares of \$5 each. Of this stock 256,800 shares have been issued, leaving 143,200, out of the original 400,000, in the treasury. The president

conda, the latter town adjoining Greenwood.

In 1896, when Frederic Keffer, M. E., took charge of the development of the Mother Lode group, there was not even a prospect shaft of 25 feet on the property. Now the footage of development work totals over 8,500 feet, not counting the immense amount of work done in the extensive ore quarries being operated so successfully by the company.

The lode found on the Mother Lode is very large, the surface varying from



BRITISH COLUMBIA COPPER CO.'S SMELTER.

In 1896 the claim was bonded to Col. John Weir, F. L. Underwood and S. F. Tichenor, of New York, who that year formed the Boundary Mines Co., to develop the Mother Lode. They began work on the property in September, 1896. In March, 1898, the British Columbia Copper Co., Ltd., was formed in New York, with a capital of \$1,000,000 to acquire and

of the company is F. L. Underwood; vice president, F. L. Sommers; treasurer, C. E. Laidlaw, and secretary, R. H. Eggleston, all of New York City. The general manager of the company from the beginning has been Frederic Keffer; superintendent of the smelter, J. E. McAllister; superintendent of the mine, S. C. Holman; cashier, George B. Paul, all of Greenwood and Ana-

80 to 150 feet in width. It has been cut in trenches for a distance of over 1,800 feet north from the main shaft to where it disappears under a heavy drift, and a large surface exposure on the Primrose, some 700 feet in the opposite direction, also shows its continuity to the south, the whole making a gigantic body of smelting ore. The main shaft is down 325 feet, with



FREDERIC KEFFER, M. E., MANAGER BRITISH COLUMBIA COPPER CO.

long levels running at both 200 and 300 feet depth. At present the smelter's two furnaces are being supplied from the surface of the ore quarries, it being found a much more economical method of getting out the ore.

The main ore quarry has been opened well up the side of the Mother Lode hill, other openings having been made at other levels, and tunnels run beneath, through which the ore is dropped from the large quarries, and thence taken at small cost to the crushers, which are located at the mine itself.

Shipments from the Mother Lode, by years, have been as follows:

	Tons.
1900	5,340
1901	99,934
1902	141,326
1903	138,079

Total..... 383,779

The Mother Lode has been steadily developed quite as long as any mine in the Boundary, and longer than most of the properties. It was the first mine

to have a power plant capable of doing much development. In 1898 a ten-drill straight line air compressor was hauled to the mine from Marcus, Washington, then the nearest railway point, the cost for hauling alone being about \$3,000. In 1901 a 40-drill cross-compound condensing Ingersoll-Sergeant air compressor, with two 100 horse-power boilers, and a first-motion Jenckes hoisting engine, with other plant, were added to the equipment. The company has erected comfortable and commodious mine buildings and residences for the employes the number employed at the mine now being from 90 to 100.

The smelter equipment of the British Co-

lumbia Copper Co., Ltd., is complete in every respect. In addition to the usual complement of ore crushers, cornish rolls, sample grinders, etc., the smelter is supplied with two Allis-Chalmers stack furnaces, 42 inches wide by 150 inches long, inside dimensions of tuyeres, of which there are ten on each side, of 3½ inches in diameter. At present the power for the two No. 7½ Connellsville blowers, as well as for other purposes, is furnished by a Reynolds Corliss engine, rated at 150 horse power, there being three 100 horse power boilers to make the steam. This will soon be superseded, however, by electric power from Cascade, 25 miles distant, a contract having been made with the Cascade Water, Power and Light Co. to furnish all the power needed, and the pole line and substation having been practically completed.

The best of results have been obtained at this smelter in reducing ore, owing to the ore itself being like most Boundary ores, of a self-fluxing nature, that is, needing but little outside ores to mix with it to make it run well in the furnaces. The first furnace was blown in February 18, 1901, and the second in June, 1902, there being room left for the addition of several more furnaces, which may take place this year. The tonnage of ore treated at this smelter for the several years, including the foreign ore received for reduction, was as follows:

1901	117,611
1902	148,600
1903	162,913

Total

429,124
Heretofore the copper matte from the Mother Lode smelter has been converted into blister copper at the converter of the Granby Co. at Grand Forks, but in a short time the company will be converting its own matte at the smelter, as a converter building has been erected, and two stands of



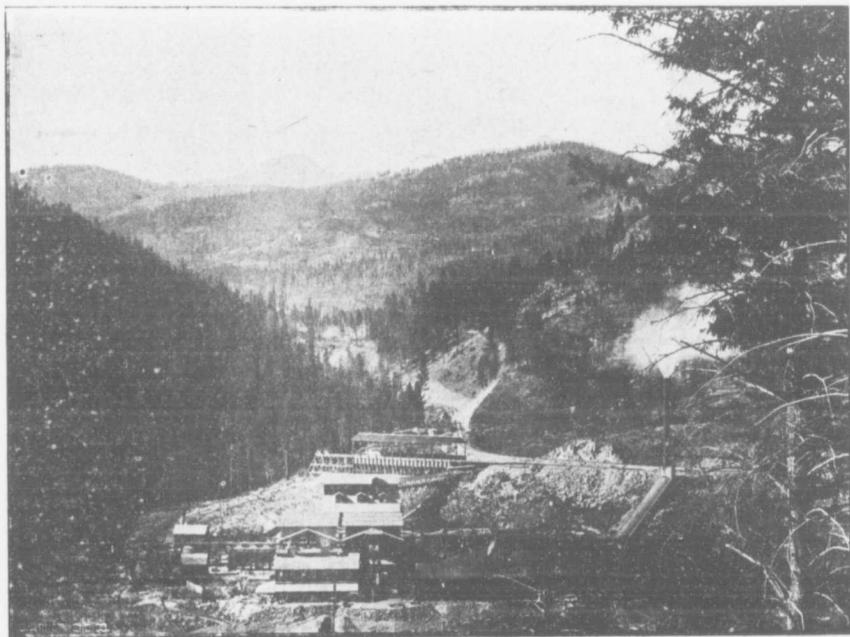
RESIDENCE OF FREDERIC KEFFER.

copper converters ordered, which are expected to arrive and be put in place early this year. The converter plant will include the following machinery: In powerhouse (81x40), a Nordberg blowing engine, arranged for either steam or electricity, capacity 5,000 cubic feet of air per minute, at 12 pounds pressure; a 300 horsepower Canadian General electric variable speed induction motor, with switch boards, etc; two sets of transformers to reduce voltage from 2,000 to 550; a 75 kilowatt motor-generator to produce direct current at 250 volts, for driving electric crane, and trolley locomotives; an hydraulic accumulator and

the plant up to date in every particular.

In some respects the Mother Lode is fairly representative of the larger copper-gold ore deposits occurring in the Boundary district. The croppings are in places soft oxides of iron from decomposition of ore-bearing rock and in others unaltered magnetic iron oxides, very solid and compact, carrying copper pyrites and gold. In still other places they are calcite with copper pyrites, iron pyrites, more or less quartzose material, and carrying some gold. These croppings differ from those on the Granby Co.'s Knob Hill mine, in which specular iron occurs, a

tell within a few feet where the pay ore will run out. On the other hand the ore gives place to the barren country rock on the hanging wall side with comparative abruptness, fading away completely within a foot or two. The chemical composition of the hanging wall and of the ore lying against it—leaving out the pyrites—is substantially the same. According to the best geological authorities who have examined the district the ore bodies are altered limestone. Here, as at the Old Ironsides, Knob Hill and B. C., porphyry dykes intrude, and it is considered quite probable that these intrusions afforded means of ingress for the



BRITISH COLUMBIA COPPER CO.'S SMELTER—AN EARLY VIEW.

pump, for tilting converters, run by 25-horsepower motor.

In the converter room there will be two converter stands equipped with all necessary appliances; five shells will be provided; a 40-ton, 4 motor electric travelling crane will handle matte in 5-ton ladles, which will be filled by launders connecting with furnace hearth. The flue dust will be caught in specially arranged steel and brick dust chambers. The building will be entirely of steel. A spur from the main line of the C. P. R. serves the converter department of the works. No expense has been spared to make

fine grained magnetite being more generally characteristic of the Mother Lode outcrops, the chief of which was a big copper-stained blow-out, standing out prominently and distinctly noticeable from all of the surrounding thinly timbered hills.

The footwall, as disclosed by development work, is for the most part limestone, and the hanging wall a diabase. On the footwall side there is not as a rule a marked transition from ore-bearing or barren rock, but the ore often grades into the country rock outside of what is more or less defined as the ore body, so that it is difficult to

ore-carrying solutions from beneath, consequently the presence of a porphyry dyke is usually regarded in this district as a favorable indication when prospecting for ore.

Although the croppings on the Mother Lode appear in somewhat of a crescent shape, the general trend of the lead or ore deposit is north and south. The ore bodies pitch to the east at an angle of 55 to 65 degs. The ores themselves may be classed in three general groups: 1. A calcite carrying copper pyrites and iron pyrites, these sulphides sometimes being massive and sometimes scattered in small crystals

throughout the rock. Some quartzite is also often present. 2. A silicate of lime, iron magnesia and alumina, carrying both copper and iron pyrites, massive or scattered, and frequently also quartz, garnets or serpentine; often all three together. Occasionally, too, a small quantity of zinc blende occurs in this class of ore. 3. An excessively hard magnetic oxide of iron, with silica and copper pyrites; not often much iron pyrites.

All these ores carry gold, and the calcitic and silicious varieties small quantities of silver as well—about one to two ounces to the ton. There has been found near the lime wall on the 200 foot level ore with calcitic gangue, carrying galena and zinc blende, and assaying well in silver, but not in sufficient quantities to regard it as a separate class. The several varieties of ore above described blend into one another, more or less, but this general classification holds good.

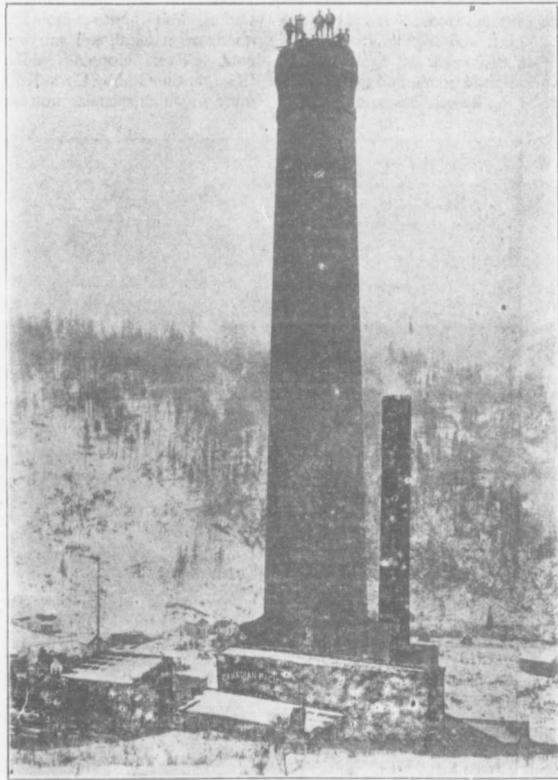
The ore body on the Mother Lode is similar in many respects to that in the Granby mines, except that it has not yet been proved to be nearly so large. For several years development work was done underground, and much crosscutting and drifting at the 200 and 300-foot levels have proved that here, too, a large body of ore of shipping grade is available.

A main tunnel has been driven 850 feet into the hill on a level with a bench on which has been erected ore bins and other facilities for ore shipping. From this tunnel several exploratory crosscuts have been run to determine the width of the ore, and three big raises have been made to the quarries above. The main quarry was opened at a level about 110 feet above that of the tunnel, and other quarries below and above. From the highest point at which the ore outcrops on the hill down to the level of the main tunnel the depth is about 260 feet, and down to the bottom of the main shaft, which is also in ore, about 530 feet. Half a dozen quarries have been opened at different places, those on the top of the hill giving a larger percentage of sulphur, facilitates matte making in the smelter furnaces. The raises from the tunnels to the quarries are funnel-shaped at the top, so that when blasted down from the faces of the quarries, the ore may fall into them without handling. Rocks too large to pass through the bin gates of the hoppers at the bottom of the chutes are "bulldozed." The ore is drawn from the chutes into 3-ton cars, which are hauled by mules to a rock crusher having the capacity of 65 to 80 tons of rock

per hour crushed to a size not exceeding five inches. From the crusher pit an elevating machine raises the ore to shipping bins above the railway track. The Mother Lode is opened up sufficiently to enable it to maintain an output up to 1,000 tons per diem, whenever the company shall increase the treatment capacity of its smelter to require that quantity in addition to custom ores it also treats.

month, January, and the plan endorsed. In a few weeks or less the Snowshoe directors will also meet in London, when it is anticipated the proposals will also be ratified.

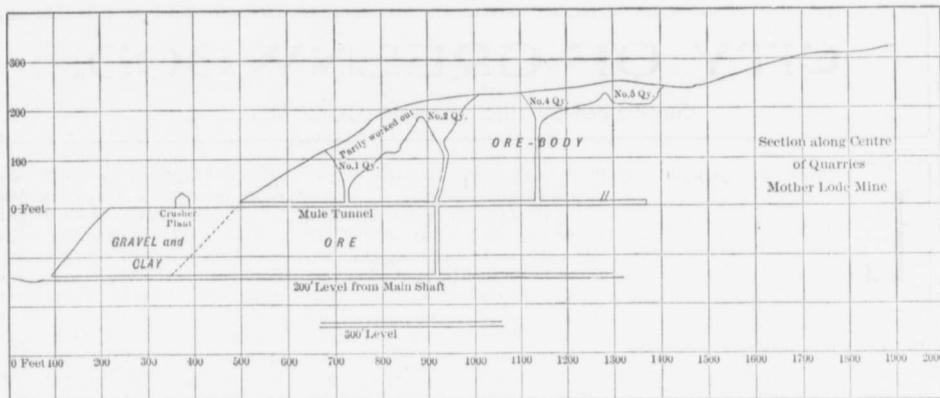
The new company will have a capital of £1,000,000, with a treasury reserve sufficient for all working purposes and to acquire additional properties, should it be deemed best to do so. The new corporation will undoubtedly



NEW STACK AT B.C. COPPER CO.'S SMELTER—highest in British Columbia—120 feet in height, 12 feet inside diameter, and contains 220,000 bricks.

For some months past negotiations have been in progress between the officials of the British Columbia Copper Co., Ltd., and those of the Snowshoe Gold and Copper Mines, Ltd., owning the well known Snowshoe group of claims in Phoenix camp, for the consolidation of the two companies. Details of the consolidation have been practically agreed upon, and the shares of the British Columbia Copper Co. have been deposited in New York for this purpose. A meeting of the shareholders of the latter company was held this

be one of the strongest companies now operating in the Boundary. The large Snowshoe ore reserves will supply a greatly increased tonnage for the present smelter of the British Columbia Copper Co., which latter will be increased in size at an early date, to meet the requirements of the consolidation. It is proposed that the new company shall be governed the first year by a board of seven directors, three to be chosen by each of the two old companies and the seventh by agreement. After the first year the shareholders will



elect the directors in the usual manner. It can be truly said that the British Columbia Copper Co. has been one of the progressive concerns of the Boundary, and under the efficient management of Frederic Keffer, has been brought to its present state of effectiveness, which bids fair to be largely increased in the near future with the combination now about to be completed. Greenwood and the Boundary have been fortunate in having a company of this class operating here.

The No. 7 Mine.

A mine of promise in which the shareholders of the British Columbia Copper Co. are largely interested is the No. 7 mine, in Central or White's camp—a mining property which is now lying idle on account of its remoteness from transportation, it having been developed to the shipping stage, and considerable ore having been sent out for test purposes by wagon to the smelter. It is one of three groups in this particular camp that have had considerable development work done on them, the others being the Majestic group and the City of Paris group.

The No. 7 mine was located in October, 1901, and up to 1896-7 had been opened to the 130 foot level. The No. 7 Mining Company, Ltd., was formed in New York in 1900, and a year later development was resumed at the mine in charge of S. C. Holman. The prospect shaft was enlarged to a double compartment working shaft, and was deepened to the 300 foot level. It has the distinction of having been deepened from the 130 foot level down and timbered at what is believed to be the lowest cost for similar work yet done in the district. Drifts have been run both east and west of the shaft at the 60 and 120 foot levels, the former about 440 feet

and the latter 450 feet. A raise to the surface was also made from the 60 foot level. On the 200 foot level a crosscut entered the ledge and also at the 300 foot level 75 feet from the shaft. Something over 2,000 feet of underground work has been done in the No. 7 mine.

The ore in No. 7 mine is quartz, mineralized with gold, silver, lead and zinc, and the vein varies in width from eighteen inches to seven feet. Several stopes have been opened, and during the time that shipments were made, something over 1,100 tons of ore were sent to the smelter. The cost of hauling the seven miles to the smelter is so great, however, that work has been discontinued till railway transportation is provided. Experiments have also been made with this ore, with a view of putting in a concentrator.

The No. 7 Mining Co. has a capital of \$1,000,000, with the following officers: President, C. E. Laidlaw, of New York; secretary, R. H. Eggleston, of New York; manager, Frederic Keffer,

M. E., of Anaconda. The mine is equipped with a power plant, including an Ingersoll-Sergeant straight line air compressor, rated at five drills, six one-man machine drills, 100 horse power boiler, air receiver, 25 horse power hoisting engine, Cameron sinking pump and necessary accessories.

City of Paris and Majestic Groups.

The City of Paris group consists of the City of Paris, Lincoln, and No. 4 mineral claims, located half a mile from the international boundary line, at a distance of about nine miles from Grand Forks and seven miles from Midway, in Central or White's camp. In development work over 700 feet of sinking and raising and 4,300 feet of crosscutting and drifting have been done; 2,000 tons of ore were shipped by wagon in 1901.

Nearby, the Majestic group of four claims has 1,150 feet of work done, some \$50,000 having been spent in development. Both groups are controlled by Granby shareholders.



MOTHER LODGE MINE—FACE OF NO. 1 QUARRY.

CITY OF GREENWOOD.

Surrounded by High and Low Grade Mines.

LAWS, as arbitrary as those which prevail in the natural world, obtain in the growth of and permanence of towns and cities. A sufficient artificial force will propel a missile into the air, but it is speedily overcome by the earth's attraction and the object falls back to its original plane.

So it is with towns and cities. The artificial impulse of promoting capital and advertising may for a time push a place into public notice, but if the conditions imperative to permanency are absent, it is inevitable that decline must ensue. Some of the conditions absolutely necessary for the permanent growth and existence of towns, I conceive to be location, resource, public spirit. There must be a reason for a town's location. There must be support for its life and growth. There

must be pride and enterprise in its government and control.

Any two of these conditions present, a town may exist but not thrive. All three are necessary for stability and growth. Location may to some form argument for investment therein. Surrounding resources may seem to demand its existence but modern methods of transportation may divert them. Civic pride and enterprise may prolong life and appearance of health for a time when all else has failed, but like the ball shot into the air, greater attractions will sooner or later provoke and compel a downward course.

Applied to Greenwood, we find that all three of these conditions obtain, and to the thoughtful and observant one the inference is plain that Greenwood must be and remain the future, as it is the present, commercial city of the Boundary country.

The men who laid the foundations of Greenwood appear to have been

gifted with a prescience in the matter of its location. Midway in the valley of Boundary creek, between the divide at Eholt and the beautiful Kettle River valley where Boundary creek flows into the Kettle, it challenges a rival geographically. Long ago nature made it the objective point of descent from the mountain ranges on either side—mountain ranges filled with vast resources of gold and silver and copper. Obeying nature's law, here the streams from the mountain ranges flow into Boundary creek. Through the heart of the city Twin creek comes down from the east. One mile north of the city Providence creek follows its course from the east into the valley. A half mile further on Eholt creek pours a generous flood into the valley. At the southern limits Copper creek comes out of the west through a pass which leads by easy grade to Deadwood and Copper camps beyond. A half mile further south Lynn creek



pours its pure waters into the valley. Along the courses of all these streams Nature decreed the future travel of the district. And so today up the valley of Boundary creek to Kimberly camp, up the valley of Eholt creek to Summit camp, up Providence creek to Providence camp, up Twin creek to Phoenix camp, up Copper creek to Deadwood and Copper camps, up Lynn creek to Wellington camp, down Boundary creek to Smith's camp, the traveller takes his way. In the paths of pioneer and prospector the high-ways of the freighter, whether by team or railway, have been laid. Greenwood is the meeting point of the waters from the mountains, the meeting place of the roads which seek their valleys. Unaided by the artificial impulse of boom advertising, the city has grown in obedience to a great natural law.

Happy in location, Greenwood is rich in resources. On all sides of her powder and steel are eating into the mountains and everywhere disclosing their locked-up wealth. One mile from the city hall northward and extending from foothill on the east to foothill on the west, and linked together as if by natural impulse for kindred worth, reach three well-reputed high-grade properties—the Providence, the Elkhorn, the Gold Bug. Other members of the same family touch hands with these on every side.

Go into shaft and tunnel, and stope the ore from any of these, and you will find values that net \$4,000 to the car. Go to their dumps and ship a car at random and you will get a value of \$2,000. Local enterprise has opened them, local enjoyment of their wealth is the result. Go east a bare half mile

again from the city hall and the E. P. U. and Gold Finch will repeat the tale. Not at all inconsiderate is the bucket brigade these nearby and newly exploited properties feed. If geologists and mining men are right, many others await only man's effort to disclose an equal wealth.

Beyond these first low hills north, east and west, the giant corporations are at work quarrying into the immense deposits of low grade ores upon which the local smelters depend for their supply. One by one the furnace fires have been lighted in the valley, and, according to present development and unanswerable logic of situation and resource, it can only be a short time until a score of furnaces are busy in

this little valley, reducing the tonnage. Nor are local faith and courage and spirit wanting. The people believe in the town, its necessity and destiny. They see a reason for its existence. They watch its steady return to the vigor of boom days. This time they mark the flush of health, which has taken the place of the fever of excitement. Many who lost money in "wild-cats" years ago, have stayed with the place, in no sense disgruntled or discouraged. Their wisdom has been justified. Many wandered away when the foam died down from the surface of their glass. Many of them are wandering back again with doleful tales of Buffalo Hump and Thunder Mountain and the Klondike. Even Nevada and Mexico and Alaska have returned their exiles.

Like a business that has swallowed up much of its initial capital before it got on a paying basis, Greenwood has had an up grade much of the way, but location and resource and pluck are winning out slowly and steadily. The managers of the Canadian Pacific railway who ramified these hills with their network of steel, knew what they were about. The three greatest banks of Canada, which planted agencies here, made no mistake. The government, which erected the court house for the Boundary at this point, read the writing on the wall. The sweet mercy of the Sisters that erected a well-equipped hospital realized that here was the sphere for their devotion and tenderness. The public and private enterprise that built city hall and school house and churches and the finest blocks of stone and brick and wood



GREENWOOD COURT HOUSE.



GREENWOOD SCHOOL HOUSE.

in the Boundary, acted prudently and intelligently.

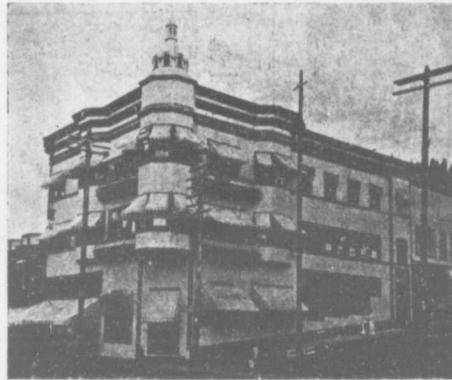
The men who, through years of depression, carried loads that were heavy, and worked with hearts that were not always light, are realizing the wisdom of a course which they often doubted, and grow thankful that they waited. The obstacles are not all removed. Faith has not all given way to sight. Reasons still remain for the practice of economy and industry that are severe, but they who know best *what* is within and around her, know *why* Greenwood is on the map and why it must remain.

W. G. GAUNCE.

Robert Wood is aptly termed the father of Greenwood, as he has ever been in the front for the good of Greenwood since that fall, in 1895, when he journeyed from Armstrong, in the Okanagan district, to the Boundary, and established the town and his business at the same time. It may be said that no one man has done more for Greenwood than Mr. Wood, who in the early days took personal interest in the building of trails and wagon roads that would bring trade to Greenwood from the many surrounding camps.

With the coming of the C. P. R. Boundary branch in 1899-1900, like other places in this section, Greenwood thrived mightily. On July, 1897, the place was incorporated, and at once took on metropolitan airs by grading streets, building sidewalks and getting water and light systems. The first assessment roll showed a valuation of \$211,935, while that for last year was close to a million and a half. Debentures were issued for improvements, and so well were they taken care of that already several thousands of dollars' worth have been cancelled.

Greenwood is the provincial government headquarters for Greenwood (formerly Kettle river) mining division, the gold commissioner and mining recorder, William G. McMynn, residing



RENELL BUILDING, GREENWOOD.

here. Last year the government erected a substantial court house at a cost of \$20,000, Mr. McMynn being registrar for both Supreme and County courts.

No city in the Boundary has better banking facilities than Greenwood, branches of the Bank of Montreal, the Canadian Bank of Commerce, and the Bank of British North America being established here. A fine public school building has been built, and five religious denominations have church buildings of their own. Secret and fraternal orders are also well represented with branch lodges, and the Sisters of St. Joseph of Peace have a well-equipped hospital here, which is doing good work.

Some of the high-grade mining properties, not elsewhere referred to in this number, should be noted here, being located in close proximity to Greenwood. Less than a mile east of the town the Gold Finch and E. P. U. groups of mines are being successfully developed by D. W. McVicar, W. T. Hunter, and others, who have a bond on the same. A tramway has been built, and several shipments of ore that run about \$100 or more per ton, have

been made to the smelters. The main shaft is down 85 feet, with some 65 feet of drifting and much surface work. About 200 tons of ore have been sent out, the values being largely gold.

Other rich claims close to Greenwood are the Providence and Elkhorn, described on pages 44 and 45 of this issue, and the Gold Bug, Defiance, Helen, Strathmore, etc. Most of these properties are under bond, and work on them during the past year has given good results. The Gold Bug recently sent out a small trial shipment of ore.

In Long Lake camp, the Roderick Dhu, under bond to a local syndicate, has been worked steadily for several months, and recently a lead of \$125 ore was reached. It is one of the high-grade properties that is just beginning to enter the shipping list.

The most important claim in Long Lake camp is the Jewel, which has had nearly a thousand feet of sinking and about 2,400 feet of crosscutting and drifting done on it. Previous to 1902 some 1,600 tons of ore were shipped to the smelters, and that year 2,000 tons more were sent out. The ore runs rather better than that from most Boundary mines, giving returns of from \$10 to \$12 per ton. The mine is connected by a four mile wagon road with Eholt station on the Boundary branch of the C. P. R., so expensive a method of marketing that nothing has been done there for more than a year past, although the mine is said to have considerable of a reserve of the same class of ore as that shipped. The Jewel is owned by an English corporation, of which Gilbert Mahon is the manager. The Jewel Gold Mines, Ltd., has a capital of £90,000, and a number of mining engineers, who have examined the company's property, reported favorably.



VIEW OF COPPER STREET, GREENWOOD.

Wellington Camp Mines.

BUT one mine is now working in Wellington camp — the Athelstan, which is located about three miles east of Phoenix. The Athelstan was located in 1896 by John Mack. Some work was done on the property in its early days, proving it to be of worth, and then for several years it was not worked. Finally the Athelstan Gold and Copper Mining Co., Ltd., was formed with the modest capital of \$50,000. The president is John Anderson; vice-president, John Mack; secretary-treasurer, W. J. Morrison. In the year 1900 the property was operated, and some 1,200 tons of ore shipped to the district smelters. In the early part of 1901 about 550 tons were shipped to the Boundary Falls smelter. At this time David Oxley was foreman in charge of the mine.

But the owners of the Athelstan were working under difficulties, as the mine was about a mile from the nearest railway spur, that of the Winnipeg, which necessitated the hauling of the ore in wagons. As is well known, most of the ores of Boundary mines are of too low grade to admit of this kind of transportation and show a profit, so work was discontinued at the Athelstan, and once again the property was allowed to remain unworked till freight rates were reduced, and smelting rates as well.

During 1903 this desirable state of affairs came about, and a local syndicate was organized to take up the Athelstan, and see if it could not be placed on a paying basis. The Boundary Falls smelter had been running successfully for some months, and the management of that institution was glad to get just the kind of ore to be had from the Athelstan.

Accordingly, in June of last year, a syndicate composed of W. T. Hunter, of Greenwood; James Hunter, of Rossland; Chas. D. Hunter, of Phoenix; Geo. H. Collins, of Greenwood, and C. W. Slawson, of Spokane, and others, made arrangements to secure a lease and bond on the Athelstan, to endeavor to overcome the difficulties incident to making a paying proposition of the property.

George H. Collins, an experienced

mining man, was made manager of the syndicate, and has been right at the property superintending the work. The ore still had to be hauled to the railway, but it is understood that, when the time comes and the shipments warrant it, the C. P. R. will run a spur to the Athelstan, thus greatly reducing the cost of marketing the ore.

Since last June to January 1, 1903, the Athelstan has shipped 6,200 tons of ore, mostly to the Boundary Falls smelter, but part of it going to the Greenwood and Granby smelters.

One of the advantages in operating the Athelstan over most mines is that it can be economically developed, owing to the soft character of the ore. As a matter of fact, the ore carries mostly gold values. It yields easily to pick and shovel, and the bill for powder is an exceedingly small one. The syndicate has not given out the results of its work, but it is understood that fair success is being met with. Last fall the syndicate also took over an adjoining claim, the Jackpot fraction, which now belongs to the group.

In the early days of the Athelstan it was worked through two shafts, there being now something over 500 feet of development in the old workings, where there is also a hoist. These workings are not being used now, however, the ore being taken out in tunnels driven into the hillside, the wagons being run underneath, so as to do away with as much handling as possible. Altogether, there has been shipped from the Athelstan something over 7,000 tons of ore.

Other Wellington Camp Mines.

In Wellington camp one of the properties that has been largely in the public eye, especially in the early days of the Boundary, is the Winnipeg. This mine was located in 1895, and has shipped all told over 5,000 tons of ore to the different smelters. A corporation was organized in 1897, which operated the Winnipeg for some years. Finally the company was reorganized as the Winnipeg Mines, Ltd., and manager R. E. Plewman made a valiant effort to place the property on a paying basis. Fire overtook the company, however, in May, 1902, destroying several of the mine buildings, the property being idle for a year and a half after that.

Last fall, the charges for freight and

treating the ore having been reduced, Mr. Plewman made another attempt to save the property for the shareholders. In this he was not successful, however, as action was begun for an old debt of the company, and the mine ceased operations in November, 1903. Now the matter is in the courts, and the winding up of the company seems inevitable. Mr. Plewman is confident that, had he been given time, he would have not only been able to pay all the debts of the company, but in time have shown a profit for the shareholders.

The Winnipeg has some 5,000 lineal feet of development work done, including a 350 foot shaft and much drifting. It has new buildings and a serviceable complement of machinery, including air compressor, hoist, pumps, etc.

The Golden Crown was the earliest location in Wellington camp, having been staked in July, 1893, by William J. Porter. After developing the property for himself for a few years, the Brandon and Golden Crown Mining Co., Ltd., was formed. This company did some 2,500 feet of underground work, the main shaft being about 325 feet deep. The first cage in the Boundary was used in this shaft. After shipping 2,240 tons of ore of a good grade, the company got into financial difficulties, and work was discontinued.

In the summer of 1901 the Golden Crown Mines, Ltd., was formed to acquire the assets of the previous company, and work was resumed for a few months at the mine, and 625 tons of ore shipped to the local smelters, which had meantime given a better freight and treatment rate than was obtainable when the C. P. R. was first built into the Boundary, and a spur was constructed to this mine. However, work was again discontinued on the Golden Crown, and the property has been idle now for some two years, pending an adjustment of the financial difficulties that overtook it. The mine has a compressor, hoist, pumps, ore bins, etc.

The Hartford group is close to Hartford Junction, adjoining the Golden Crown, and a company was formed four years ago to operate the group of six claims. A shaft was sunk 100 feet, and 125 feet of drifting done, when work was discontinued.

The Evening Star is another property that is showing favorably as far as development has gone.

The Phoenix Pioneer

And Boundary Mining Journal



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SPECIAL ISSUE.

January, 1904.

THIS SPECIAL ISSUE

This Special Issue of the Phoenix Pioneer and Boundary Mining Journal is sent out with the hope that it may be of some benefit to the Boundary country, in the way of letting its vast metallurgical wealth be known to the outside world. In the rock-ribbed hills of the Boundary is a vast heritage of valuable minerals, a heritage that we believe is equalled by few districts in the west, and excelled by none. Although development has been conducted here for six or eight years, it has largely been accomplished in the last three or four years; and although marvellous things have been done in that short time, sufficient progress has been made to give an idea of what the future will be in the Boundary.

At first capital was timid about venturing into this section, far from civilization, railway communication, etc., but it is some satisfaction to know that those who did invest to the largest extent, and in the most business-like way, are not only beginning to receive substantial returns, but there is every promise of those returns keeping up for many years to come.

It required faith of the most enduring quality to attempt to wrest profits from the low-grade ores of the Boundary under the conditions prevalent five or ten years ago—the faith that if, indeed, it did not remove mountains, at least it quarried away the hills and extracted profits therefrom. It is a satisfaction to those who do not directly participate, to know that those who possessed that faith and exercised it, are now coming in for their well-earned reward.

That the Boundary yet possesses untold values in a mineral way, which have hardly been scratched, is a well

known fact to those who are most familiar with this section. There are today, doubtless, just as great opportunities as have been taken advantage of in the past, with such satisfactory results. Brains mixed with capital can still do well in this section. Make no mistake about it. But the mixture is essential.

Not only is the Boundary the banner low-grade section of the Dominion of Canada, but it is, also, we are pleased to state, one of the great high-grade mineral sections. In few parts of the world, having both high and low grade mines, that have been successfully worked, has nature been so kind.

In the preparation of the matter for this issue, pains have been taken to make all statistics as accurate as possible, and in many cases, as far as could be done, the figures given in these pages have been verified at first hand. It is, therefore, confidently believed that the statements are, one and all, statements of fact.

The entire mechanical work of this Special Issue has been executed in the Pioneer building in Phoenix, and in considering this fact, it should be remembered that no weekly newspaper office in Kootenay or Yale, so far as known, has ever yet attempted the issuance of a publication of the scope and character here presented. The date of publication was necessarily postponed from that originally intended, largely on account of the lateness in receipt of photographs, and partly by the increased size of the publication over that at first announced. If this Special Issue shall be instrumental in attracting legitimate attention to this Boundary country, whatever may be its shortcomings in a mechanical way, the publisher will feel well repaid for the time and expense devoted to the publication. Those who have had experience with such issues can realize that he can hardly be fully recompensed in any other manner.

FOURTH ESTATE IN THE BOUNDARY.

One element that has contributed not a little to the upbuilding of the Boundary country, according to the best informed, is the newspapers. Like all other business men, the publishers have had their ups and downs, and unlike at least some others, it cannot be said that, as yet, any of them have made more than a living in the last five or six years. Through good report and ill, the editors of the Boundary journals have stood up for this section, believing that it was only a question of time when their sublime

faith would be fully justified; and here the management of the Pioneer wishes to acknowledge the many courtesies that have been extended to this paper by the brethren of the press in the Boundary.

As we have not referred to the newspapers in the Boundary elsewhere, something about them will be appropriate on this page.

Grand Forks enjoys the distinction of being the only city or town in the Boundary having more than one publication. The first weekly in Grand Forks was started some six or eight years ago by McCarter & Son, being called the Grand Forks Miner. Later the daily Grand Forks Gazette was launched by Eber C. Smith, and some three months after that the Miner purchased the Gazette, and took the latter name. Some two years ago the Grand Forks News was started by E. D. Hall, which afterwards absorbed the Gazette, the paper being known as the News-Gazette. The present publisher is L. E. Tutt. G. A. Evans has been publishing the Grand Forks Sun, at first undertaken by H. S. Turner, twice a week for two years or more, it being the only semi-weekly issued in the Boundary.

Greenwood has one weekly, the readable Boundary Creek Times, published and edited by Duncan Ross. The Times was started when Greenwood was a little village. In the halcyon days of 1900 it was issued for six months as a daily.

The Midway Dispatch, published by C. M. Crouse, is the successor of the Midway Advance, which was first issued at Okanagan Falls, in the Similkameen. In addition, the diminutive Anaconda News is issued weekly by 16 year old Robert Keffer.

Phoenix has but one weekly, the Pioneer, of which this is a Special Issue. The Pioneer was established in 1899, and is the only paper in the Boundary of which it can be said that it has never been reduced in size, and has never changed editor or manager since it was started.

A number of weekly publications appeared for seasons more or less brief. The Cascade Record was published over two years. The Cascade Maple Leaf was issued for a month. The Columbia Review lasted a few months. The Greenwood Miner appeared for nearly two years. The Phoenix News lasted but 13 weeks.

The editors of the Boundary are a whole-souled lot. They are entitled to all that is coming to them, for, as a scribe once pertinently remarked, it will not be much at most.

OTHER PROMISING BOUNDARY MINES.

Brooklyn, War Eagle, Gold Drop, Sunset, B. C. Mine, Emma, Etc.

IN the various Boundary camps there are properties, at present not being operated from various causes, but of themselves having no small amount of merit from the standpoint of the mining men.

In Phoenix camp, the most important group in this class is that of the Dominion Copper Co., known as the Brooklyn and Stemwinder group. The Brooklyn has a fine machinery plant, a shaft 350 feet in depth, and over 4,000 feet of work done; thousands of tons of ore being on the dumps and hundreds of thousands opened up in the mines. One shoot of ore in the Brooklyn is said to be over 1,000 feet long at the 200-foot level, and some 20 feet wide. The Stemwinder has some of the best ore bodies in the camp. The group, which is largely owned by wealthy men of Toronto, has not been operated for two years, but it appears that matters are rapidly working around to where operations will be resumed on an extensive scale. The rails were recently laid on the graded spur lines to both these mines.

The War Eagle, close to the Granby group, is owned by capitalists in the Eastern Townships of Quebec, who have equipped the mine with a compressor, hoist, etc., and have done several hundred feet of shaft work and drifting. It is one of the favorably located properties of Phoenix camp, and will be heard from in due time.

The Gold Drop, adjoining Granby mines, has several thousand feet of development done, but has not been worked for several years, the owners in Montreal preferring to let the large mining companies prove that profits can be extracted from low grade ores in this section.

What is known as the Marshall group of claims in Phoenix camp, nearly adjoining the Brooklyn group on the north, has an immense showing of low grade ore, which will doubtless be exploited some day with profit.

The Sunset group, in Deadwood camp, is owned by the Montreal and Boston Copper Co., which also owns the two-furnace smelter at Boundary Falls. In 1903 the smelter treated, it

is said, 132,570 tons of ore, largely of a custom character. When the Snowshoe temporarily ceased shipping in December, this smelter also stopped operations. It is said, however, that the company is negotiating with the Dominion Copper Co., owners of the Brooklyn group in Phoenix camp, the latter not now owning a smelter. Such an amalgamation would make the strongest kind of a combination.

Another Deadwood camp property on which considerable work has been done, is the Buckhorn, the ore showing being said to be excellent. Although this mine has an excellent machinery equipment, no work has been done for the last three years or more.

The Morrison mine, another Deadwood camp property, was operated a short time in 1903, and shipped something over 3,000 tons of ore. The Morrison, like some other mines, has had many vicissitudes, having been re-organized a couple of years since. The copper ore contains elements, however, that are desirable for smelting, and when a railway spur is constructed to the mine from the Mother Lode branch of the C. P. R., the mine, it has been stated, can maintain an output of 100 tons daily. The Morrison is equipped with air compressor, hoist, etc.

No work has recently been done in Copper camp, although the Copper Mine and King Solomon claims have a considerable quantity of high grade ore awaiting shipment.

In Summit camp, the B. C. mine was closed last summer, after having shipped almost 100,000 tons of ore. It took a front rank among Boundary mines for several years, and has paid for itself from net proceeds of ore shipments, although the owners do not seem to care to spend more money in prospecting for new ore bodies.

At the Emma mine, adjoining the Oro Denoro, in Summit camp, there has been activity for many months past. The mine is being operated by the Hall Mining and Smelting Co., of Nelson, who wanted the iron ore for fluxing purposes. Ore is quarried here in an economical manner, and in 1903 some 22,000 tons were shipped to the several smelters that wished this class of ore. The operators have a bond on an interest in the property.

The Senator group in Summit camp was bonded late in 1903 to Granby

smelter interests. It is now being opened up to advantage on the quarrying system, a carload being shipped every other day. Surface prospecting on this group has disclosed an immense body of desirable iron ore.

On the Rathmullen group of claims, not far from Summit camp, on which considerable work was done three or four years ago, but which have been inoperative since that time, development work has been resumed since January 1st, and the management has faith in the outcome.

CHRISTINA LAKE

CHRISTINA lake, on the eastern edge of the Boundary country, a beautiful body of water some 20 miles in length and perhaps a mile wide, has been described as "the sportsman's paradise and the pleasure-seekers' resort," and this terse description only does it bare justice. Located but half a mile from Fife station on the C. P. R., and a mile from Cascade, with its dry and bracing climate, generous soil, well-timbered hills and metalliferous surroundings, Christina lake is destined to be a popular resort in the near future.

The first settler on this lake was Charles Sandner, who reached its shores in the summer of 1896, and has since made his home at the upper end of this delightful sheet of water. He was impressed from the first with the lake, and took up a ranch of 320 acres, which he has been cultivating and beautifying each year since. Mr. Sandner has done much to develop the resources by erecting a shingle mill, having shipped several cars of the finest cedar shingles. He is now building summer cottages, and this year will have a steamer on the lake.

For the sportsman, Christina lake is a paradise, bear, deer, and small game abounding in every direction. Fishing is also excellent, much of the fresh fish in the Boundary now coming from this lake. Already Christina lake is the Mecca of many a camping party from Boundary towns in the summer time, the temperature averaging 75 degrees, just right for bathing.

THE

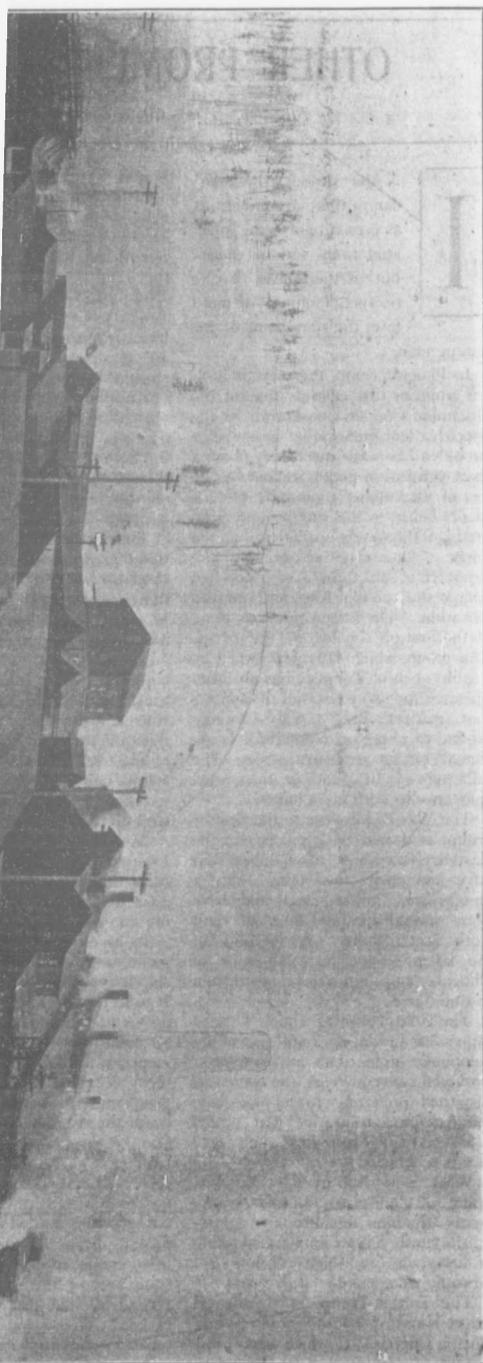
METALLURGY only in Britain and Canada the United States has been amazed by the economy with which the ores are re-

worked of the Granby Mining, Smelting and Power Co. at Grand Forks. The smelting has been reduced to the least possible expense, with the best possible results, of a kind not to be found in this or any other land. It is the opinion of experienced experts from abroad, who were called in to examine half-disbelieved reports, that the waste has gone away thoroughly.

Of course, there are expenses for this most satisfactory result. In the first place, the power of the Granby Co. is secured available to be superintended by the works. Then they utilize the power, being transmitted by every known device for the economical side of the work was introduced, including automatic furnace charging under the supervision of Mr. A. B. W. superintendent. Last, they were favored in the Phoenix ore which they treat—this ore being of a self-fluxing nature, there is no need of roasting or mixing with comparatively little fuel well in the furnaces.

All these things aided by efficient results, in which the capital and executive a degree played a most important part.

The reader will do well to remember that at Grand Forks the largest copper smelter in the world which is turning out 1,500,000 pounds of copper monthly, besides the by-products of great value. Not only is it the largest reduction works in the United States, it is operated at the mine with a success which is a credit to the company to already be producing a fair profit to the shareholders. The probability of its being operated for an indefinite period is great. The Phoenix mines, 25 miles from Grand Forks, are an almost inexhaustible source of ore.



THE GRANBY SMELTER.

Scene of the most Economical Reduction Works on the Continent.

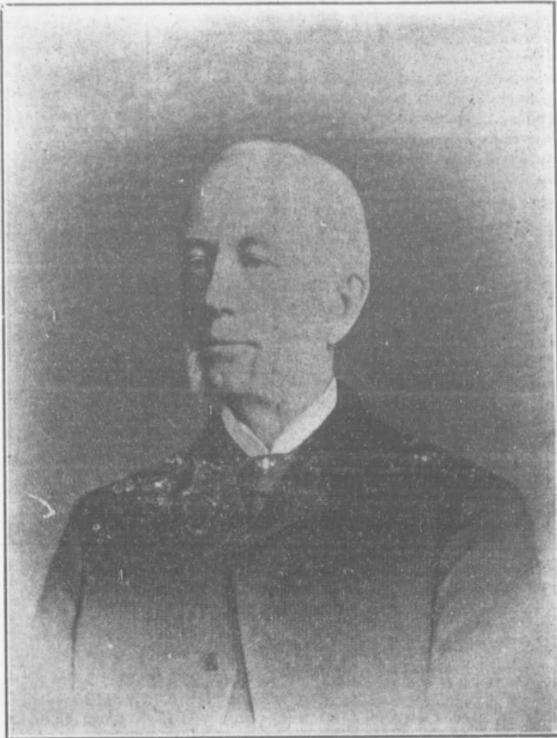
URGISTS, not British Columbia, but all over the United States, have gazed at the economy which Boundary has reduced at the newly Consolidated Power Co., Ltd. The science of reduced here to the use, with the greatest of any smelter in the world. At least, this experienced smelter, who have come believing, but have been fully convinced. There are excellent reasons for the present state of affairs. The management of the smelter has secured the best man for the position, the superintendent of the smelter has utilized water for power transmitted by wire. The method for working out the ore is the result of the question of the smelting, including even the charges, the invention of W. Hodges, the superintendent, but not least, the method in the nature of which they had to work practically of a smelter, thereby requiring no special fuel with other ores, and the method of fuel to make it run smoothly. The smelter is aided in the magnitude of the plant, which also ample evidence of the ability of a high class of an important part. It does well to remember that the smelter is located in the Yukon Territory, in Canada, about 500 miles out approximately from Vancouver of blister copper, the gold and silver values extracted. It is the largest reduction works in the Dominion, but it has been built at a minimum of cost, and the method has enabled the company to begin the payment of dividends to the shareholders, with its being continued period, the company's 5 miles distant, having an inexhaustible supply of

After working on the construction for perhaps a year, the first furnace of the Granby smelter began the work of reducing the ores from the company's mines in August, 1900. Inside of eight weeks the second furnace was in operation. The success of these two furnaces was so satisfactory that it was at once decided to double the capacity of the plant, and in March, 1902, the third furnace was started, the fourth being blown in the following month. Still greater things in the smelting line were projected, however, and two more furnaces were ordered, and, after many delays, were started in the fall of 1903—making the full battery of six furnaces now in operation at this smelter, besides the reverberatory furnace. Further additions which are contemplated,

will call for the erection of a duplicate smelting plant.

At first the copper matte, the product of the blast furnaces, about 50 per cent. fine, was shipped east, where it was converted into blister copper and the gold and silver values extracted. But the company had to pay freight across the continent on some 50 per cent of waste, and as soon as possible a two stand copper converter was added to the plant, which meant a large saving in the item of freight alone. This converter has not only handled the matte of the Granby smelter, but that of the four or five other smelters in the interior of British Columbia, as well, up to the present.

Last summer a party of prominent Americans, who had recently invested



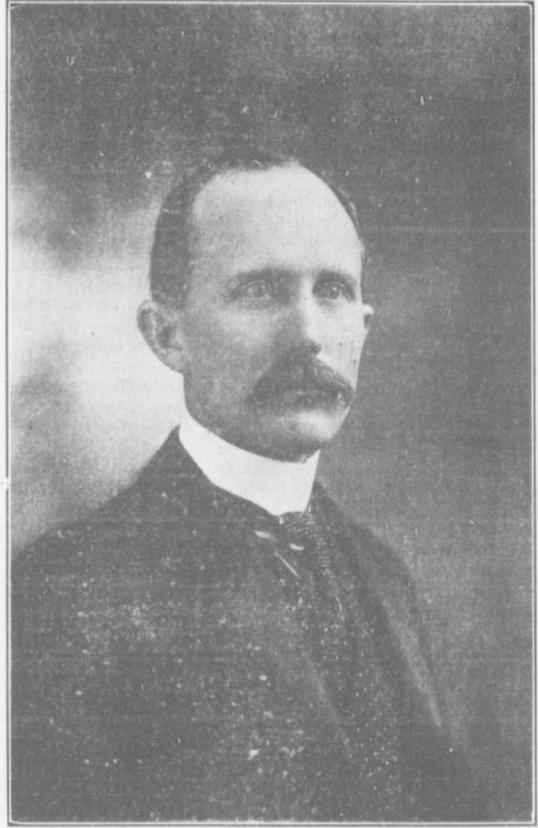
S. H. C. MATHER, PRESIDENT OF GRANBY CO.

one million dollars in Granby Company shares at the market price, made a visit to the mines and smelter. In the party, besides the officials of the Granby Co., were John Stanton, of New York, who is known all over the United States as the father of the copper industry; George Martin Luther, manager of the Nichols Chemical Co., of New York, the largest copper refiners in the world; Clement S. Houghton, of Boston, a young man who inherited vast wealth; W. A. Paine, a leading banker and broker, of Boston; J. B. Francis Herreshoff, vice-president and technical manager of the Nichols Chemical Co.—all gentlemen largely interested in the Michigan copper industry.

After visiting the Granby mines and smelter, Mr. Stanton had the following to say:

"There is no question as to the immense quantity of ore in sight in the Granby mines, and I am free to admit that I came west prepared to discount a great deal of what I have heard. How deep this deposit extends no one knows. It is purely conjectural. However, there is every reason to believe that the depth should be commensurate with the length and width of this well defined lode. All the reports I had received respecting the size of the ore body and its self-fluxing character have been confirmed by personal examination.

"I was really surprised to see so intelligent and up-to-date a company in operation in your province. I refer especially to the mining methods as well as the organization, the mining and smelting plants and the system of book-keeping. I have visited a great many mining camps during the past half century and nowhere have I seen superior methods in vogue. I was



J. P. GRAVEL, GENERAL MANAGER, GRANBY CO.

not prepared to see such a state of affairs in existence outside of the United States. I have not a single criticism to offer. Both Mr. W. Volen Williams and Mr. A. B. Hodges have solved the mining and metallurgical problems respectively, in an eminently satisfactory manner.

"The Granby ore-body is the largest sulphide ore deposit I have ever examined, and my mining experience has extended to every variety of copper ore. It is analogous to the famous Rio Tinto of Spain. The Granby ore is lower in copper but it carries larger values in gold and silver. It is larger than the famous Tennessee deposit. Hitherto sulphide ore bodies from 40 to 80 feet wide have been considered large, but the one at Phoenix eclipses anything I ever inspected. I don't know of its equal on the continent. The millions of tons of ore in sight and the vast stopes proved a veritable revelation to me.

"I believe the Granby can operate at a profit no matter to what figure copper might fall. With that corporation it is only a question of increasing or diminishing product. I think the Granby, with the advantage of gold and silver in its ores, can produce copper at a price that would put less favorable mines out of business. Certain Michigan mines now operating at a profit would be compelled to close down if copper fell below 12 cents. The Granby has not yet begun to extract ore on a large scale. When the capacity of the smelter is increased, copper will be produced at a much lower figure. I think I am well



H. N. GALEE, ASSISTANT MANAGER, GRANBY CO.

within the mark when I state that it is practicable for the Granby to produce and market the metal at a cost of seven cents per pound, and possibly lower. There are very few mines that could do likewise.

"I admire," said Mr. Stanton, in conclusion, "the pluck and resolution with which Mr. Miner has handled this big enterprise since its inception. Credit is also due Mr. Graves, who has displayed a marvelous grasp of every detail. The affairs of the company have certainly been administered with a high degree of intelligence."

Mr. Herreshoff said:

"There is little need of me speaking about the Granby smelter. Under the superintendence of A. B. W. Hodges it speaks for itself. The results now achieved in the treatment of low-grade ores, however, are really remarkable. Ordinarily, capital would shrink from undertaking the problem of mining and smelting low-grade copper ores similar to those of the Granby, and containing small values in gold and silver. The whole conception of the Granby enterprise indicates great depth of thought and remarkable attention to detail. Had every factor in the problem not been solved, it is questionable whether success would have been achieved.

"The smelter plant is favored by the fortunate composition of the ores, which

contain iron, lime and silica in such proportions that smelting goes on with the greatest ease. It is also fortunate that the amount of sulphur in the ore is of the exact quantity to produce a matte of the desired strength without resorting to the expensive process of roasting the ore in heaps. The bes-

semerizing operations are also up-to-date in every respect.

"With the enormous ore bodies already developed and in sight at Phoenix, coupled with the able management and economical methods in mining and smelting, the Granby Co. as a producer is destined to become one of the leading factors in the copper industry."

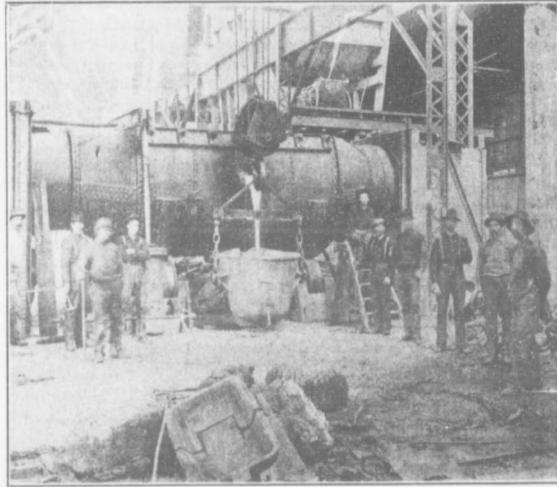
The following table gives in chronological order some data in regard to the starting of operations at the Granby smelter:

Construction started	July, 1899
First ore received	July, 1900
First sampler started	Aug. 13, 1900
First furnace started	Aug. 21, 1900
Second " "	Oct. 13, 1900
Third " "	Feb. 27, 1902
Fourth " "	Mar. 17, 1902
Fifth " "	Nov. 5, 1903
Sixth " "	Nov. 6, 1903
Converter started	Jan. 14, 1902

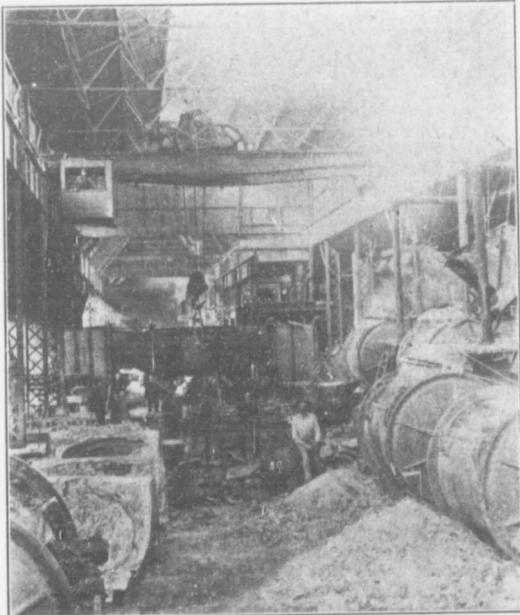
In regard to the tonnage of ore treated at the Granby smelter since the first furnace was started, August 21, 1900, the following figures tell the story, the ore all coming from the company's Phoenix mines, with the exception of occasional small shipments from other Boundary and Republic camp mines:

	Tons.
1900	62,387
1901	230,828
1902	312,340
1903	401,921

Grand total..... 1,007,476



GRANBY SMELTER—POURING MATTE FROM REVEALER. TORY FUENACE.



GRANBY SMELTER—CONVERTER ROOM.

For the year 1903 the production of gold, silver and copper at the Granby smelter was as follows, the figures given being official:

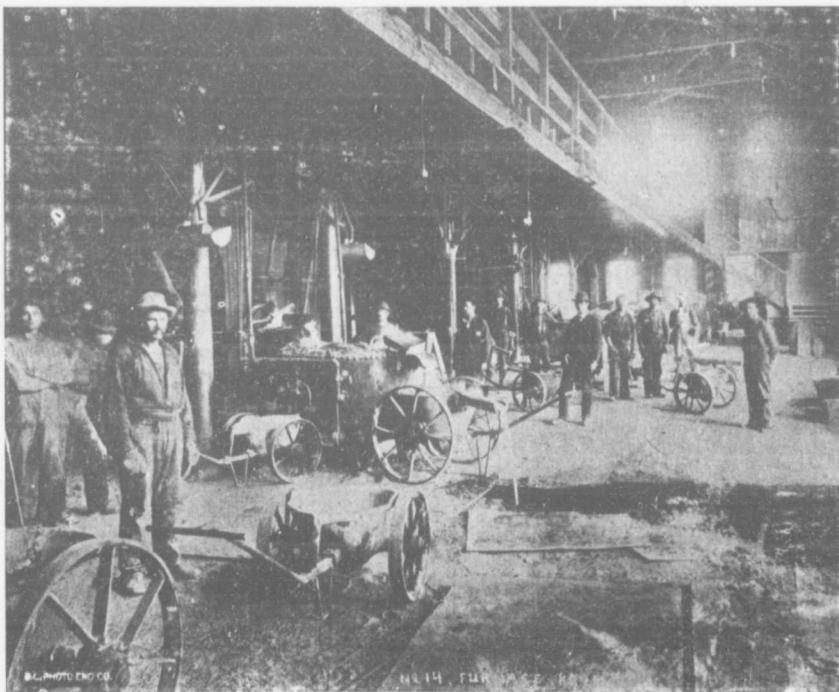
Copper.....	16,932,356 lbs.
Silver.....	356,900 oz.
Gold.....	47,500 oz.

A brief description of the plant and machinery in use at the Granby smelter will be found of interest. While the initial plant consisted of but two blast furnaces, with blowers, electric fixtures, etc., each year has seen a considerable addition to the machinery,

cast steel 5-ton matte ladles; two 12x14 Canadian Rand Drill company's locomotives, one Davenport saddle-tank locomotive, and fifteen 6-ton Union Iron Works slag cars, for dumping the slag hot instead of granulating it; and some necessary equipment to make the copper converting part of the works equal to converting the copper matte from 12 to 14 furnaces of the type in general use in Boundary smelters—roughly 70 to 100 tons of matte each twenty-four hours. A tilling machine, for doing intricate small work, was added to the power appliances of the

year, and a double-circuit three-phase line was brought in three miles from the main transmission line between Cascade and Phoenix.

The electrical equipment placed in the smelter sub-station includes one set of 1,000 horse power Canadian General Electric air-cooled step-down transformers, with motor and Buffalo blower, one set of 800 horse power Westinghouse oil-cooled transformers, switch-board lightning arresters, static interrupters, and the customary other apparatus. The voltage is here reduced from 22,000, which is the



GRANBY SMELTER—FURNACE ROOM.

until now it is as complete as human foresight and energy can make it.

In the plan of increasing the capacity of the reduction works during 1903 by one-third, extensive additions were made to the plant. Two new double-decked water jacket blast furnaces, 160x44 inches at the tynes, were put in (bringing the treatment capacity of the smelter, now having six furnaces, up to about 2,000 tons per day); three standard Connellsville blowers, and three 100 horse power Westinghouse electric motors to operate them; a full complement of receivers and

machine shop. The furnace room was extended 108 feet and the blower room about 50 feet, these additions increasing the length of the main buildings to about 350 feet.

Besides the generating electric current equal to about 1,100 horse power at its own power house, situated just below the smelter on the North Fork of Kettle river, the Granby company uses electric power supplied by the Cascade Water, Power and Light Co., with which it has a contract for up to 1,000 horse power. A brick sub-station was built at the smelter early in

pressure carried on the transmission lines, to 500 volts. Besides making this provision for extra power, more lighting facilities were added about the works.

Taking it all in all, it is doubtful if a more complete smelting plant can be found on the American continent than that of the Granby Co. at Grand Forks. This, taken in conjunction with the company's mines at Phoenix, now so splendidly developed and superbly equipped, would make it appear that the Granby Co. will, indeed, be a factor in the world's copper market.

GRAND FORKS

THE GATEWAY CITY OF THE BOUNDARY

ONE of the most picturesquely situated towns of the Boundary is Grand Forks, located at the confluence of the main Kettle river and the North Fork of the same stream. The wide and fertile valley of which it is the commercial center has an estimated area of about 20,000 acres, the land being very prolific, agriculture and horticulture being most successfully carried on. For many years it was known as Grand Prairie,

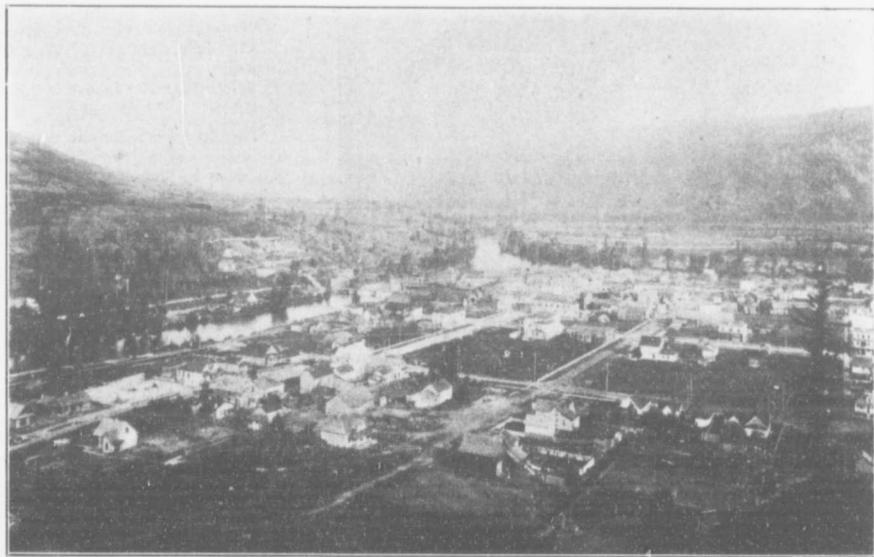
community. A sample of this progressiveness is found in the history of the location of the Granby smelter five years ago.

Before it was definitely decided where this extensive enterprise should be situated, General Manager Graves and his associates in the Granby Co., examined the different sites throughout the Boundary, some five of them, including Cascade, Carson, Midway, Greenwood and Grand Forks. The enterprising citizens of Grand Forks saw the advantage of the location of this large smelter near their town, and offered such inducements that it was

citizens. A branch of the Great Northern was also encouraged in a substantial manner to reach the city.

The industry of all others on which Grand Forks depends is undoubtedly that of smelting, as here is located, as above noted, the six furnace smelter of the Granby Co. This company employs here about 300 men, making a steady monthly payroll, which in conjunction with mining interests and agriculture, give employment to a considerable number.

Some idea of the importance of this smelter can be had from other pages of this issue, where the smelter is more



GENERAL VIEW OF GRAND FORKS.

but when the mineral discoveries of the Boundary began to draw the prospectors from all quarters, a thriving town sprang up, which was the nucleus of what is now the prosperous city of Grand Forks.

In the course of time, another town grew up close to Grand Forks, first known as Upper Grand Forks, and later as Columbia. Just a year ago, by mutual agreement, Columbia was taken into the corporation of Grand Forks, the combination making of the two cities an energetic and progressive

decided to accept the site.

This is but a sample of the enterprise displayed by the founders of Grand Forks, which spirit has been displayed in all public enterprises, such as securing new railways, etc. Even now it is stated that plans are on foot for the location of another large and independent smelter at or near Grand Forks. The building of the Grand Forks and Republic railway, which connects the well known American mining camp on the south with the Boundary, was due to Grand Forks

fully described. Reference also to the map printed in this number will give an idea of the strategical position, as it were, of Grand Forks, being the nearest point of importance in the Boundary to the American side, as well as the supply point for the rich but as yet undeveloped mineral fields of the North Fork of Kettle river.

Grand Forks is the customs port for the whole Boundary, with sub-ports at Greenwood, Laurier, Midway, Sidley, Osoyoos and Keremeos, which report to R. R. Gilpin, the collector of

customs. Sydney R. Almond, the gold commissioner for Grand Forks mining division, has his office, as well as that of mining recorder, here. He is also registrar of the Supreme and County Courts, with other provincial appointments.

His Honor, Andrew Leamy, County Judge, resides in Grand Forks, as does I. A. Dinsmore, Chief License Inspector for the Boundary Creek district.

The city of Grand Forks is essentially a residential centre, many fine homes dotting the landscape on all sides of the municipality. In educational facilities Grand Forks certainly

scholars. W. H. M. May, M. A., is the principal, with four assistants. The board of trustees consists of William Spier, I. A. Dinsmore and H. C. Hanington. The high school, the only one in the Boundary, was opened in September, 1903, and is under the principalship of C. W. Clark, M. A. In educational facilities Grand Forks is certainly in the front rank.

Five church organizations have erected buildings in Grand Forks, namely, Presbyterian, Roman Catholic, Methodist, Church of England, and Baptist, while fraternal societies are represented by Free Masons, Odd Fellows, Foresters, Knights of Pythias

pine, spruce, fir, tamarack and other timber, that can and will be sawn up and manufactured into a merchantable shape. Already there are some saw mills in the district. When the railway is extended up the North Fork, which is projected, it will not only open the mineral but the timber wealth of that section.

Since the inception of the town, there has been a steady increase of the valuation of property each year, showing a marked advance. For the last six years the assessed valuation of Grand Forks has been as follows:

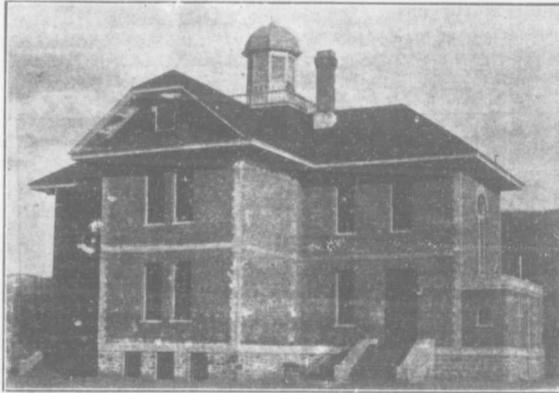
1898.....	\$275,143
1899.....	506,607
1900.....	964,745
1901.....	1,003,900
1902.....	1,037,719
1903 (including Columbia)	1,399,650

Included in the assets of the city of Grand Forks are the following:

Waterworks plant, etc.....	\$79,033
Electric light plant.....	40,492
Schools.....	26,219
Fire department equipment..	8,506
Real estate and buildings....	9,332

The city council for the year 1904 consists of mayor Jeffrey Hammar and aldermen N. McLellan, F. H. Hutton, William McNee, M. R. Feeney, A. L. Cements and Neil McCallum. W. B. Lower is city clerk and J. A. McCallum city treasurer.

Banking facilities in Grand Forks are of the best, there being two chartered banks having branches here, besides a private bank. The Eastern Townships Bank and the Royal Bank of Canada are represented by local branches, and the British American Trust Co., Ltd., has its headquarters here, with branches at Vancouver, Victoria, and Coleman, Alberta. This company has an authorized capital of \$100,000, and does a general financial and trust business throughout the district.



GRAND FORKS PUBLIC SCHOOL BUILDING.

takes a front rank with cities many times larger and older in this province. About a year ago a modern stone and brick schoolhouse was opened, which is complete in every respect, having six class rooms, a large basement and the latest sanitary arrangements. It cost over \$20,000, and is a credit to the city and to the entire Boundary. The average attendance is over 200

and Eagles, the latter having their own meeting hall.

While mining, smelting and agricultural pursuits are the chief resources of the territory tributary to Grand Forks, lumbering bids fair to be of great importance in the near future.

Extensive timber limits have been acquired up the North Fork and its tributaries, and there is abundance of

GRAND FORKS

The GATEWAY CITY of the Boundary

Offers unsurpassed inducements to the settler in search of a farm, stockman seeking a ranch, the fruit grower an orchard, the prospector in search of mineral wealth, the lumberman, the business man, or the capitalist, whether large or small. Three railroads furnish transportation. For further information write or call on the *GRAND FORKS TOWNSITE COMPANY, Ltd.*

BRITISH AMERICAN TRUST CO., Agents, Grand Forks, B. C.



G. A. FRASER, M. P. F., OF GRAND FORKS.

Notwithstanding the fact that the chief industries on which the city of Grand Forks depends are generally supposed to be those of smelting and agriculture, the mining possibilities in the territory of the Gateway City are decidedly important. This territory is largely up the North Fork and its tributaries, Grand Forks being the natural outlet and supply point for that entire territory. While many of the mineral properties are now quiescent, many of them only lack the requisite capital to give them every chance of being profitable undertakings.

During the last year the Betts and Hesperus group, located on Hardy mountain, within three or four miles of Grand Forks, has been acquired by the Hesperus Gold and Copper Mines, of Chicago, who have been developing the properties since last July, under the management of T. H. Rea. Some 200 feet of surface prospecting was

done, and a tunnel driven in ore on the footwall side of the vein, and then for 25 feet across it, when a winze was sunk 75 feet. Higher values were reached with a wider vein. A smelter test of a ton of ore gave \$15 in all values, copper predominating. Development is now being continued.

The Volcanic, now the Volcano, on the North Fork, has been bonded by several Michigan capitalists, who have organized the Volcanic Mining and Smelting Development Co., and are now testing the property with diamond drills. Alexander Mead, an experienced mining engineer, has charge of the work. Should the results of the diamond drilling prove satisfactory, extensive development will take place in the spring.

The Seattle mine, also on the main North Fork, has been worked for some time this past year by the manager of the Trail smelter, but at present nothing is being done there.

Some other properties of evident merit are the Humming Bird and the Golden Eagle, which together have sent out something like 1,000 tons of ore, while the Strawberry and Little Bertha have each sent out a car of ore. The Earthquake and the Pathfinder have also had considerable work done on them, but like many others, while the showings were encouraging, development capital has so far been lacking to prove their actual commercial worth. The Pathfinder has two shafts, 125 and 135 feet in depth, with some 700 feet of crosscutting and drifting. Most of these ore bodies are large masses of pyrrhotite ore, carrying values in gold, silver and copper.

On the East Fork of the North Fork is a promising district known as Franklin camp, but

as yet far distant from transportation. Consequently, the work done as yet is limited, but shows up favorably when compared with older camps at the same age. A wagon road has been completed to within 20 miles of Franklin camp, but until this stretch is finished supplies cannot be gotten in nor ore out. The best known claims in Franklin camp are the Banner, McKinley, Gloster, Pollard, etc.

On the West Fork of the North Fork of Kettle river, some 50 to 60 miles above Grand Forks, a number of coal bearing seams have been discovered, and coal prospecting licenses have been taken out. As yet, however, no work of consequence has been done on these coal measures, and while they may prove valuable in time, it is yet too early to say much about them. Should they prove to be anything like what is claimed, they will be of the greatest assistance to the smelting industry of the Boundary, owing to their proximity to the several reduction works, comparatively speaking.

With three valleys converging at Grand Forks, there is ample room for growth. Its varied resources and industrial development being already assured to a large extent—bid fair to make this city one of the most important in the entire interior.



YALE HOTEL, GRAND FORKS.

▶▶▶▶▶ J. MILNER, ◀◀◀◀◀
 ... Artistic Photographer ...

GRAND FORKS AND PHOENIX, B. C.

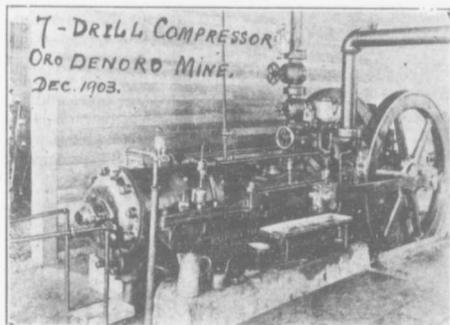
Views of Residences, Mines, Mills, Underground Pictures by
 Flashlight, Etc., made in every Part of British Columbia.

The Oro Denoro Mine.

Summit Camp Property that Gets Out Ore for 40 Cents Per Ton.

ONE of the low grade mines of the Boundary that is making a most enviable record for itself is the Oro Denoro, adjoining the Emma mine, in Summit camp, and but two miles from the town of Eholt. This record is worthy the attention of any mining man for the reason that, although the values are small, and the mine has passed through vicissitudes not uncommon, at present it is one of the most economically managed properties in the Boundary, and, if report be true, is making money on every ton of ore sent to the smelters. The ore, having a high percentage of iron, is sought for by the district smelters for use as a flux—so much so, indeed, that some of the ore has actually been treated for nothing.

In October, 1893, William Corbett located the Oro De-



nororo, but like most Boundary claims, no work of consequence was done on it till the C. P. R. began throwing its bands of steel into the Boundary from the Columbia river in 1898. When the construction gang ran a line right over the Oro Denoro, and cut a ledge of copper-gold ore, the property attracted attention.

The King Mining Company was formed, and considerable work was done in the shape of sinking a shaft and cross-cutting. But with the fever of the first Boundary mining excitement over, the property lay idle, the company's treasury was empty, and for years nothing was done. About a year ago, Smith Curtis, one of the largest shareholders, succeeded in getting the company reorganized as the Denoro Mines, Ltd., with a capital of \$1,500,000. In the meantime, also, the cost of treatment at the smelters had gone down to less than one-third of the early price. Then, too, it was found that iron ores, with gold-copper values, were none too plenty. Another feature was that the ore could be mined in the economical way always advocated by Mr. Curtis, viz., by quarrying from the surface.

After having the property carefully examined by a competent engineer, work was started last May, and has been kept up almost uninterruptedly ever since. In that time some 16,000 tons of ore have been mined and shipped at a profit to the district smelters.

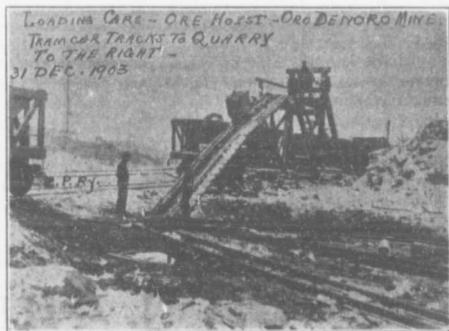
The examination of the property disclosed two important veins of ore, and a conservative estimate made at that

time, showed that upwards of 100,000 tons of ore could readily be taken out, with the limits of the ore bodies not yet reached. For several months work was done entirely with hammer and drill, but last fall a seven-drill air compressor was installed, with a ten horsepower steam hoist, the compressor building being 30x40 feet. The C. P. R. has already put in two sidings to facilitate the shipment of the ore, and another is to be constructed to a point below the tunnel level in the spring, giving the mine the best of shipping facilities. In addition to this the Oro Denoro ground is crossed by the definite survey line of the Great Northern branch from Grand Forks to Phoenix, to be constructed next spring.

Recently Mr. Curtis made the statement that, including all mining costs whatsoever, the Oro Denoro was placing its ore on the railway cars at a cost of not more than 40 cents per ton—a figure, so far as published facts go, that is as low as that of any other Boundary mine.

Beginning at the C. P. R. railway track, the magnetic vein has been stripped a distance of from 60 to 80 feet, the ore dipping to the north, and giving promise of still greater depth. In blasting across this vein a face of some 15 feet or more has been made, and tests have proved that practically all of the ore is of a good shipping grade. The No. 1 tunnel vein was stripped for some 75 feet, all of it shipping ore, and here also a siding was put in and ore sent out. The ore is run into the railway cars on an incline with a small steam hoist.

During the progress of this surface work and considerable shipments, the old workings had not been touched. They consisted of the original shaft, sunk from the top of the hill, and three tunnels. With the advent of power,



however, a machine drill, with two shifts, was started in the No. 3 tunnel, some 200 feet from the portal, to crosscut to a point directly under the surface workings, where a raise to the ore quarries will give a large area of valuable ore that can be economically broken down and shipped to smelters.

Officers of the Denoro Mines, Ltd., are: J. S. C. Fraser, manager Bank of Montreal, Rossland, president; Aulay Morrison, Vancouver, M. P., vice-president; Smith Curtis, Rossland, managing director and secretary-treasurer; and a board of directors of the above and Henry Hart, a capitalist of Three Rivers, Que., and C. R. Hamilton, Rossland.

ELECTRIC POWER IN THE BOUNDARY.

ONE of the most important industrial enterprises in the Boundary district is the long distance transmission of power by means of electrical energy, generated from the waterfalls of the Kettle river at Cascade, a little town 13 miles east of Grand Forks. This enterprise has become important because the largest mines and smelters of the Boundary are utilizing the power, and the three incorporated cities, Greenwood, Grand Forks and Phoenix, are lighted from it.

In 1898 the first work of harnessing this wonderful power, which nature had so bountifully provided, was begun. Since then nearly \$500,000 has been spent in the work of installation, power house, sub-stations, lines, etc.

The Cascade Water, Power and Light Co., the shares of which are controlled by an English company, represented in this country by S. S. Fowler, M. E. of Nelson, has, it is estimated, between 5,000 and 10,000 horse power that can be utilized in the falls of the river at Cascade. At present 3,000 horse power is being used, the complete plant now installed and in working order is so arranged that it can readily be increased when the demand justifies it.

The plant includes three units of generators, standard Westinghouse, three-phase, two-bearing, direct-coupled, 2,200 volt, 750 k.w. at 80 per cent power factor, or 940 k.w. at 100 per cent power factor, 60 cycles per second, 300 r.p.m.; two exciters, each capable of exciting all three generators at one time; 45 k.w., 120 volt, shunt wound dynamos, self-contained, two-bearing type, direct coupled to independent turbines, with 500 r.p.m. The turbines are H. Morgan Smith wheels made at York,



CASCADE POWER HOUSE

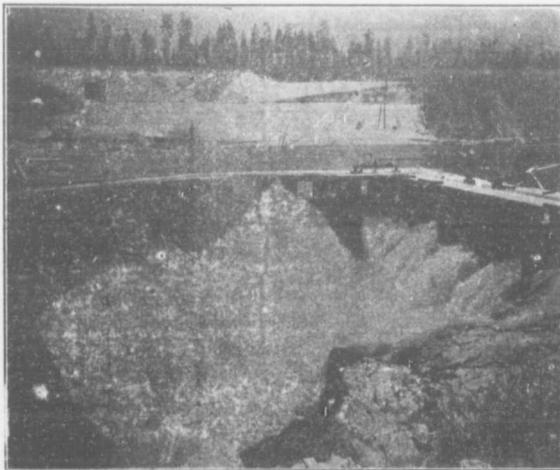
Pa., and the governors of the Echer Wies make of Switzerland. The nine transformers are of the standard Westinghouse type.

Transmission lines at present erected are from Cascade to Phoenix, a distance of slightly over 21 miles, with feeder three miles to the Granby smelter at Grand Forks. An additional five miles of pole line is all but completed from Phoenix to Greenwood, to furnish power to the Mother Lode smelter. Probably the line will be carried on to the Montreal and Boston Co.'s smelter at Boundary Falls, four miles below Greenwood, in the near future.

The following machinery is driven by this power, beside its use as an auxiliary for the Granby smelter plant at Grand Forks, and lighting cities before mentioned: At Phoenix, two 700 horse power motors, driving the air compressors which furnish the motive power for the Granby mines, including drills, hoists, pumps, machine shop, etc., and the pumps of the Phoenix water supply; a 100 horse power hoist at the Snowshoe mine, where it is expected that, with the early resumption of operations, much more power will be required; at Greenwood, in addition to the power to be supplied to the Mother Lode smelter, other mines are considering the use of this economical power.

From the above, it is a foregone conclusion that the Cascade Water, Power and Light Co. will shortly find it needful to duplicate the present generating plant, allowance for which has been made in the erection of the present installation.

This result, as well as all construction of the plant, is a decided credit to the company's local engineer, Wm. Anderson, C. E., who has designed and executed the work.



400 FOOT DAM AT CASCADE.



LAKE MINE SHAFT HOUSE.



Proposed Don Pedro Tunnel Site—will give 125 feet depth under present shaft.

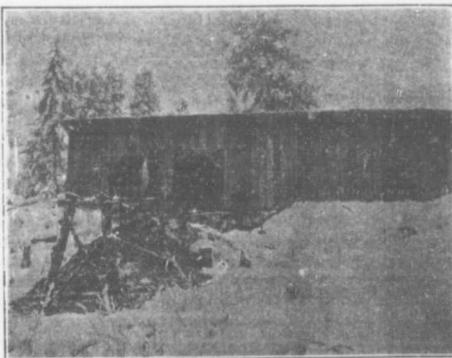
PROPERTY OF THE
CHICAGO BRITISH COLUMBIA MINING CO.,
 * * * PROVIDENCE CAMP. * * *

SITUATED in the high grade belt, midway between the famous Granby and Mother Lode mines, are the properties of the Chicago British Columbia Mining Co., comprising the Lake, Idola, Don Pedro, Yellowstone fraction and Crescent fraction, 177 acres in all. This group was acquired by the Chicago British

Columbia Mining Co. in 1901, the head office being in Chicago, with Wm. L. Springer as president, Nic Kuhnen treasurer, and Geo. W. Raithel secretary—all prominent business men in Chicago. The company has a capital of \$2,000,000 in one dollar shares.

Considerable work has been done on these claims, but the greater part

on the Lake claim, where there is a vertical shaft 165 feet in depth. This shaft has two compartments and is well timbered, with some 75 feet of crosscuts, and good ore in the workings. The Lake has an excellent machinery equipment for development purposes. It consists of a 60 horse power boiler, with a 6x8 Jenckes hoist,



Don Pedro Shaft House - Scene of late rich strike.



Don Pedro—Interior of Shaft House and Blacksmith Shop.

and No. 5 Cameron and Snow pumps. The shaft house, 32x50 feet in size, is well built throughout, with boiler-house and blacksmith shop annex.

Further up the hill on the Don Pedro, a ledge of fabulously rich gold and silver ore has been discovered by Manager H. H. Shallenberger, and for the last few months a force of men has been employed opening up the same under his direction. Here the ledge has been stripped for about 300 feet, showing a continuous ore chute for

that distance. On this ledge a shaft has been started, having at this time reached a depth of about 40 feet. The ore has been continuous from the surface down, and has improved in size and values with every foot of development. Tests made from surface ore gave \$300 per ton, while tests at 30 feet in depth gave as high as \$1,000 per ton. A trial shipment will be made to the smelter in the near future.

The B. C. Copper Co.'s smelter is located on the Canadian Pacific rail-

way, within two and one-half miles of this property, while the Montreal and Boston Copper Co.'s smelter is situated but three miles further down the valley at Boundary Falls. The Great Northern railway also has surveys through the company's properties, and will build at an early date. This insures the company a good market for the ores, with a moderate rate of treatment, and in the near future these properties should be found in the dividend paying column.



Harry H. Shallenberger, the subject of this sketch, is probably better acquainted with the mines and mining conditions of the entire Boundary district, than most of the residents of this section, and has probably done as much toward bringing the Boundary country to the front as any single individual. He was born at Brownsville, Penn., near Pittsburg, on February 13, 1867, and started west when 13 years of age, living for a few years at Streator, Ill. In 1882 he struck out for the far west, reaching Spokane, in the neighboring state of Washington, in that year, where he followed the

calling of contractor and builder for eight or ten years.

In common with many Spokaneites, he had heard much of the province of British Columbia, and in 1893 he decided to try his fortunes in the mining districts. In the summer of that year he reached what is now the Boundary country, having previously prospected over the ground where Rossland now stands. The party which he organized to visit the Boundary country consisted, besides himself, of R. G. Mack, who later located the well known Athelstan mine in Wellington camp. Bruce White, of the Slocan Star mine, which has since made its name, and J. C. Haas, M. E., joined the Shallenberger party at Christina lake. They prospected as far as 75 miles north of Christina lake, but found nothing they fancied in the mineral line. They came over the Dewdney trail to the Boundary proper, there being no railways, wagon roads or other trails in those days, having to cut out the Dewdney trail all the way from Rossland to Boundary creek, that being the only settlement in this section at that time. Before this Mr. White left and went back to the Slocan.

The first location made by Messrs. Shallenberger, Mack and Haas was the Crescent, two miles from Greenwood, in Providence camp, this being in August, 1893. This claim was afterwards sold to the Greenwood Crescent Gold Mining and Milling Co. of Spokane. The Crescent is one of the several high grade properties of this camp, that have recently come to the front, and has several hundred feet of development work done, Mr. Shallenberger being still one of the large shareholders. It has three shafts, rang-

ing from 16 to 85 feet in depth, with some crosscutting, and having ore that runs \$100 in gold, copper, silver and lead.

Mr. Shallenberger also located several other promising properties among which are the Yellowstone fraction, the Crescent fraction and the Idola, in 1895, which, with other claims, he sold to the Chicago British Columbia Mining Co., in 1901. These claims are now being developed under the supervision of Mr. Shallenberger, with most encouraging results. The main shaft on the property is down 165 feet, with 100 feet of crosscutting, with considerable ore, a 20-foot vein having been encountered in sinking, with copper and gold values. The property has a good machinery equipment, and work is being carried on farther up the hill on the Don Pedro where, in a 40-foot shaft a good ledge has been found. This vein, by tests, has been found to run 400 ounces in silver, \$12 in gold and 15 per cent lead, or a total value of \$317 per ton.

In 1901 Mr. Shallenberger acquired the Alameda, in Deadwood camp, adjoining the famous Mother Lode mine on the south, which latter has shipped some 350,000 tons of ore. The Alameda has the trend of the Mother Lode vein. Another property acquired by Mr. Shallenberger is the Moreen, also in Deadwood camp, adjoining the Buckhorn, one of the highest grade mines in that camp. Considerable work has been done on the Moreen, proving its value.

Mr. Shallenberger is known as a careful and conservative mining man, who has taken advantage of his opportunities to study the mineral zones of the Boundary thoroughly. In time his many valuable holdings should make him independently wealthy.

The Elkhorn Mine.

A Property with a Most Remarkable Record.

THERE are very few mines, either in the Boundary country or in any other mining district, of which it can be said that they have paid every dollar of their operating expenses and purchase price from the net proceeds of the ore taken out in development, and left a balance. Such, however, is the story of the Elkhorn, a mine located about two miles from the city of Greenwood, in the high grade belt.

In 1893, the Elkhorn was staked by William Fowler, who was employed on the Providence, adjoining, which latter Mr. Fowler in later years developed to a point where he sold it for several thousands of dollars. But he does not seem to have had a very high opinion of the Elkhorn, at least at that time, for he sold the prospect to Charles Thomet, of Midway, for little or nothing. Mr. Thomet held it for years, occasionally giving bonds on the claim, but each time it falling back into his hands. For instance, H. C. Walter, who worked the Providence, took a bond on the Elkhorn, and extracted \$600 worth of ore. Geo. Guest also had a bond, as did W. T. Smith, W. T. Hunter and J. C. Haas, all of whom finally gave up attempting to make a mine of it. All this did not help the reputation of the Elkhorn, it may be surmised.

However, on the 9th of December, 1902, Mr. Thomet gave a bond on the Elkhorn to Phil McDonald and James Sutherland, two men thoroughly familiar with mining, Mr. Sutherland having previously made a careful examination of the property. This bond was for one year, the amount being for \$7,500, of which \$2,500 was to be paid in six months, and the balance at the end of the year, with a 20 per cent royalty on

ore shipped, to apply on the bond. On December 10th, the next day, the new owners took hold and began development work, which has been continued to this day with the greatest success. In the little more than a year that Messrs. McDonald and Sutherland have been working they have sunk a shaft 150 feet, and at the 80 feet level have drifted 200 feet on the ore body, and west for 100 feet. At the 150 foot level, drifting west has been done for 60 feet and east for 75 feet, an air shaft having also been driven to the surface from the 80 foot level. In all some 600 feet of development has been done.

been shipped to the smelters, the net results having paid all the working expenses and the \$7,500 bond, leaving a balance in the bank.

Mr. Sutherland has himself been in active charge of the development on the Elkhorn, where since March last a force of 14 men has been steadily employed in extracting the high grade ore of this property. The mine and buildings are lighted by electricity, and are so close to the city of Greenwood that the miners frequently go to their work on bicycles.

Mr. Sutherland came to the Boundary country in the year 1897, and is one of the owners of the townsite of Greenwood itself. He is largely interested in other mineral claims throughout the district. Mr. McDonald has been a resident of the Boundary also for the last five years, having previously lived in different parts of this province, and at this time being a business man in Greenwood.

It is the intention of the owners of the Elkhorn to continue working on the property for the present as in the past, and it is not unlikely that later a strong corporation may be formed for the purpose of developing the mine on an extensive scale. Whatever may

be done, however, it is certain that the energy of the owners of this mine in its exploitation, in the face of several previous failures with the same property, which has been so profitably justified, has had no small share in the directing the attention of mining men to the possibilities of the high grade mines of the Boundary.

As a matter of fact, the success of the Elkhorn and Providence mines, in the high grade belt, has already been the cause of several working leases and bonds being taken on other properties near Greenwood, many of which are showing up in such a satisfactory manner with development that they are rapidly being placed in the Elkhorn and Providence class—mines than can pay.



ELKHORN MINE.

But two men were working on the Elkhorn till the shaft was down 50 feet, pay ore having been reached at a depth of 45 feet. Ore after that was found in all the workings, from four to eighteen inches wide, with few breaks. The Elkhorn ore is largely gold and silver, and by the carload runs \$20 gold, 165 ounces silver, and small values in lead, the total values running about \$100 per ton net. At first it was shipped to the Trail smelter, but latterly the ore has gone to the Greenwood and Boundary Falls smelters.

The ore shipped was all taken out in the course of the development of the property, and about 400 tons have

The Providence Mine.

Boundary's First Dividend Payer.

W

HILE the low grade mines of the Boundary have made it widely known in the last five years, it should not be forgotten that the country came to the front because of its high grade properties. These were what first attracted the hardy prospectors of the late eighties and early nineties, before the price of silver had fallen to a low figure. It can be better understood how valuable some of the

Boundary's high grade mines were, when it is remembered that at first when shipments were made the ore was packed on the backs of horses twenty or thirty miles, thence in wagons forty or fifty miles to the railway at Marcus, Washington, whence it was sent to the coast smelters, and yielded a profit even then.

Of the many high grade mines surrounding Greenwood which have come to the front in the last year or two, the Providence is the most important, having had the most development work done on it, and having shipped the most ore—ore that netted the company from \$100 to \$200 per ton—and having declared the first dividend.

It was in the spring of 1892 that William Dickman, a prospector, who had been attracted to the, comparatively speaking, terra incognita known as the Boundary, wandered up the valley of Boundary creek and located the Providence mine in May. But little work was done on the claim, however, till H. C. Walters, a Spokane mining promotor, happened along and took a bond on the property. He worked it for some months and took out considerable high grade ore, shipping it to the Everett smelter, with excellent profit, notwithstanding the remoteness from railway transportation,

and consequent excessive cost of marketing.

But Mr. Walters finally became discouraged, and let the Providence stand idle for years. However, William Fowler, an old prospector who had worked for Mr. Walters, always believed that the Providence would pay big some day, and this thought he kept in mind during his subsequent wanderings all over the mining fields of the west.

Finally Mr. Fowler looked up Mr. Walters, who gladly gave him a lease and bond on the property a couple of

patrick and Franklin Rudolph of Chicago, J. H. Peet of Spokane, and W. S. Macy of Phoenix.

The first year of active operations of the new company ended September 30, 1902, and the report of the general manager for that period was of a most encouraging nature, in that time the mine having been continuously actively developed and new and larger ore bodies having been opened up. It showed that 543 tons of ore had been mined, on which the company had realized the sum of \$54,315. The cost of getting out this ore was \$20,917,

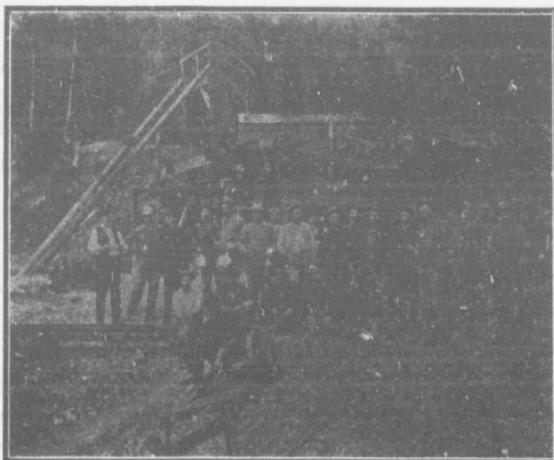
leaving a handsome profit for the operations of the first twelve months. And what cannot have failed to be a pleasant thing for the shareholders, the company has also declared dividends amounting to some \$5,600, at the same time carrying over a comfortable reserve. This dividend is notable as being the first dividend ever declared by any mine in the Boundary country, and the company expects to distribute them more or less frequently hereafter.

Duncan McIntosh, the manager, a gentleman who has had a

wide experience in mining, has conducted the operations of the company with the greatest satisfaction to the directors. In his annual report of the first year's operations, after going into the details of the year's development, and showing where the rich ore bodies were located and their extent, Mr. McIntosh said:

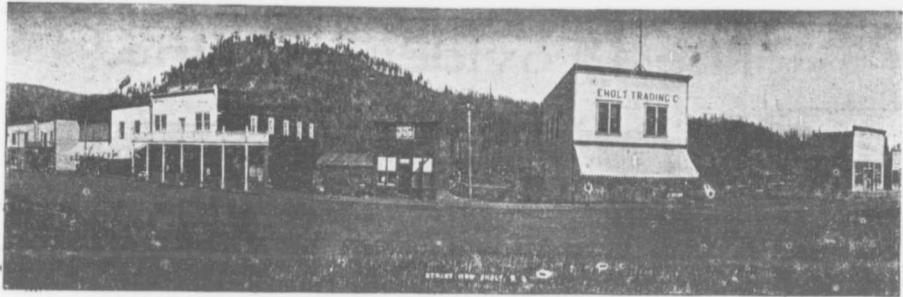
"I estimate there are 750 tons of ore in sight, averaging \$100. This estimate is over-conservative, as that has been the expressed wish of the directorate that we keep everything on a conservative basis. It will not take any stretch of the imagination to double the amount."

The Providence success has attracted general attention to the advantages of Boundary's high grade mines.



PROVIDENCE MINE.
Shaft-house and Employees.

years ago. Then began the wonderful career of this rich mine. Mr. Fowler knew what he was about and soon had the mine on a paying basis, getting rich gold and silver ore and plenty of it. This attracted the attention of local capitalists, and a company was formed to take over and develop the mine. The new company was called the Providence Mining Co., Ltd., and has a capital of \$200,000, which was soon subscribed. The officers are: President, Mark F. Madden, Chicago; Vice-President and Manager, Duncan McIntosh, of Greenwood; Secretary-Treasurer, W. M. Law, of Greenwood; other directors: J. J. Caulfield and J. A. Russell, of Greenwood; H. J. Fitz-



Eholt, Boundary's Railway Town.

Eholt may be considered the railway divisional point of the Boundary branch of the C. P. R., as it is here that the largest amount of ore traffic converges, and here that the majority of the ten or fifteen trading crews have their homes. The town itself is located on the divide between Grand Forks and Greenwood, being 17 miles from the former and nine miles from the latter. It has several hotels, and two good stores, doing an excellent business with the families and several mining camps in the vicinity.

It is at Eholt that the railway branch, ten miles long, diverges to Phoenix, and all the ore traffic from Phoenix camp, no matter where bound, passes through Eholt. The railway company has machine shops and round houses here, as well as its district coal bunkers and ice houses.

This railway business practically makes the little place what it is today, a lively village, with progressive citizens. But the mining interests contiguous to Eholt are by no means insignificant. Summit camp, the mines of which have so far shipped over 150,000 tons of ore, is but two miles distant. For a long time the chief producer was the B. C. mine, but latterly the two chief shipping mines have been the Emma and Oro Denoro, in the same camp, both of which are now on the active list, and likely to remain so. The Emma is being operated by the Hall Mining and Smelting Co., of Nelson, and the Oro Denoro by the Denoro Mines, Ltd., the ores of both being much sought after by the different Boundary and Kootenay smelters on account of their excellent flanking quality. There are probably 100 men

employed between the two properties. Long Lake camp, where are some well known properties, such as the Jewel, North Star, Ethopia, Lake View, Roderick Dhu, Gold Drop, Boulder, etc., is easiest reached from Eholt, and will some day be a busy scene, as many of the ore bodies are of comparatively high grade.

Eholt has, of course, daily mail facilities, with telegraph and telephone systems. A public school is maintained and religious services are held. The town first began its existence when the railway into the Boundary from Rossland was built, in 1889-90, and has been growing ever since. The payroll of the railway is estimated to be something like \$10,000 monthly, while that of the mines in the vicinity is several thousands of dollars more, and is growing.

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AMPLE COKE SUPPLY FOR BOUNDARY.

International Coal and Coke Co. Has 64,000,000 Tons of Coal.

ONE of the outgrowths of the shortage of the coke supply for Boundary smelters, experienced in the past, has been the formation of the International Coal and Coke Co., for the purpose of developing valuable coal deposits in the Crow's Nest section. Within the last year or two all the Kootenay and Boundary smelters have been forced to close down for longer or shorter periods on account of irregularity of the fuel supply. After a time some of the officials of the Granby Co., the largest user of coke in this section, decided to control their own supply if possible, and formed the above-named company, after securing valuable coal measures at what is now the town of Coleman, three miles west of Blairmore, Alberta, and just across the boundary line of British Columbia.

This company has a capital of \$3,000,000, with the following officers: President, A. C. Flumerfelt; vice-president and treasurer, H. N. Galer; secretary, W. G. Graves. D. Shultz, C. A. Fowler and R. A. Paulson are also on the directorate. While the company is in no way connected with the Granby Co., some of the latter's officials are shareholders in the coal company, and to a certain extent both companies will work together, it being the intention to supply the Boundary smelters with coke, as far as possible, in preference to others.

There is no doubt whatever that the International Co. has now under development some of the most valuable measures of coal in that entire region, now so famous for its coal fields. In order that there should be no mistake about the measures they had acquired, the management of the International Coal Co. secured the opinion of one of the most eminent specialists in this line. Geo. S. Baton, of the engineering firm of Elliott & Baton, of Pittsburgh, Penn., made a thorough examination of the Coleman coal fields, and reported most favorably on them.

Some extracts from this report will be found of interest. Mr. Baton said:

"Your coal field near Blairmore, Alberta, is remarkable for the number and thickness of the veins it contains and for the fact that the outcrops are near the railway with enough bottom land between to permit of a good plant being built. Already six veins of workable thickness have been proven on the property, totaling in the neighborhood of fifty feet of clean coal. These veins run in a northerly and southerly direction through the property, and that they are regular and

falls to 300 feet above the railway at the tunnel's you have started on Carbon Run. As the coal pitches at about 35 degrees, this will give you an average of 700 feet on the pitch and make about 14,000,000 tons here above water level. South of the tunnels mentioned to the end of the property, about three miles, the hill is higher, and a rough estimate gives an average of 2,000 feet on the veins, which would make about 50,000,000 tons, making a total in the five miles south of the railway of 64,000,000 tons above water level.

"As in all this country, your veins differ as to hardness, amount of ash and coking qualities, but all of them make good coke and lead me to unhesitatingly recommend any outlay that is necessary to erect and equip a modern plant.

"You can expect to find a coal with a uniform pitch between 35 and 45 degrees. This will permit of a very economical method of working the coal, viz. by chutes from the face of the breast to the wagons on the haulage way. You will thus effect a great saving, as it will avoid the expensive methods used by other people in the region to get their pit wagons to and from the mines to the heading, and it should enable you to do all your hauling in the mine by electricity; in fact, the conditions here should enable you to get out your coal as cheaply as it is possible to mine coal anywhere in the region; in fact, the physical conditions are such that you will be able to more than meet any competitors."

Acting upon the advice of Mr. Baton, President Flumerfelt last fall contracted for the entire supply of electrical and other equipment, including motors, generators, electric locomotives, etc.

It is understood that the initial equipment of the colliery for a production of 2,000 tons of coal daily will cost about \$150,000. This also includes the erection of the initial battery of 104 coke ovens, which are now in process of building, and which number will be more than doubled later,



A. C. FLUMERFELT,
President International Coal and Coke Co., Ltd.

consistent is shown, first by the conglomerate rock which overlies them and which, being very hard, is well defined on the surface, and by the fact that they are found in good shape wherever we have tested for them.

"As to the amount of coal below the water level, you are only limited by the depth you care to go below water level. Starting at the railroad and going south, the outcrop begins at water level near the railway and gradually rises to an elevation of 700 feet, then

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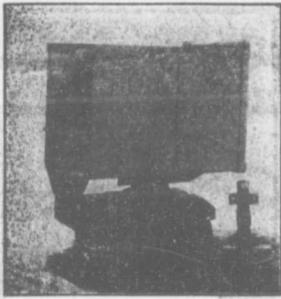
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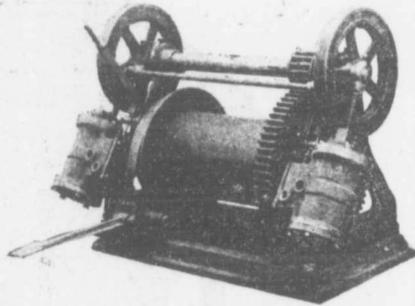
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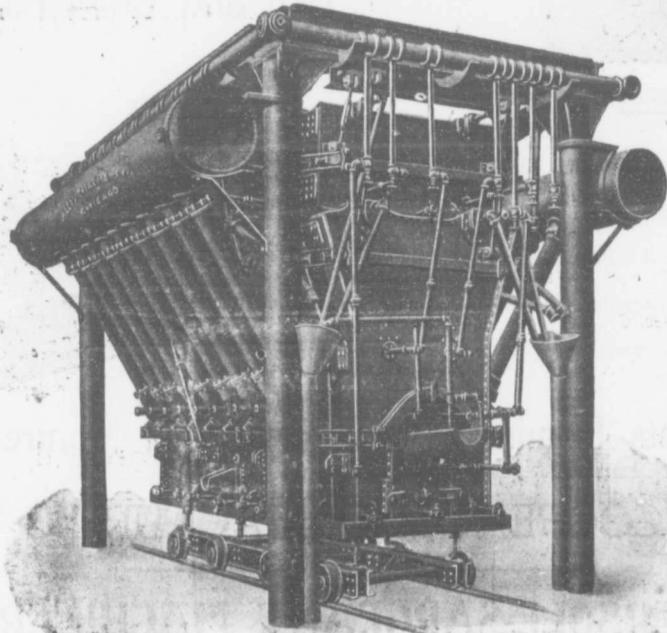
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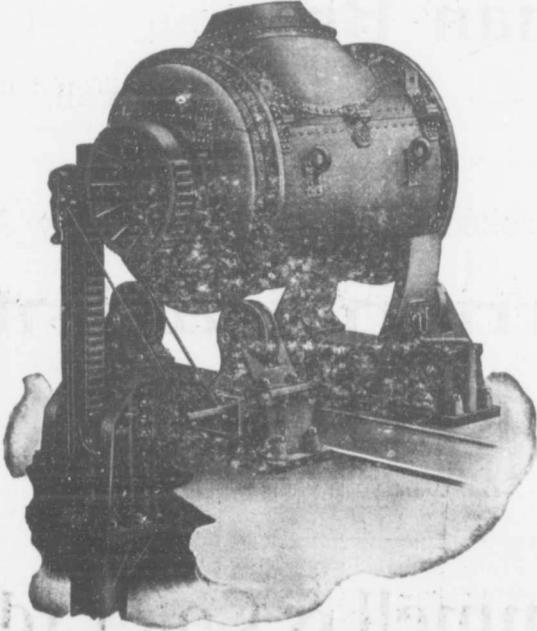
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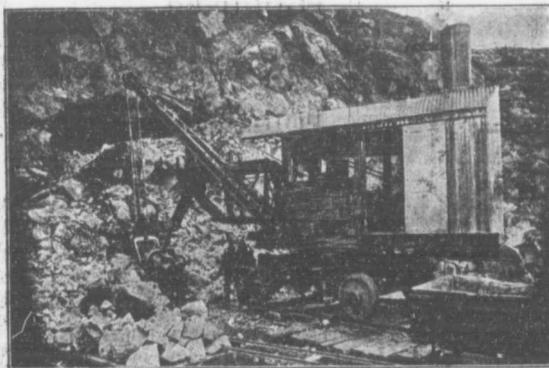
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.....OUR OILS ARE ENDORSED BY THOUSANDS OF THE LARGEST.....
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Hamilton Powder Company

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MANUFACTURERS OF HIGH EXPLOSIVES

BLASTING, MINING, STUMPING, and SPORTING Powder

DEALERS IN

ELECTRIC BLASTING APPARATUS

SAFETY FUSE, DETONATORS, Etc.

THE HAMILTON POWDER CO. claims to be the second oldest corporation that has, without interruption or reorganization, made HIGH EXPLOSIVES IN AMERICA. Through their predecessors, they have manufactured POWDER since 1776. This record guarantees the HIGH QUALITY and absolute honesty of their output.

CONSIDER THIS when hesitating between a well-known brand of explosives, which has stood the test of years, and an inferior and lower priced compound. In order to obtain satisfactory results from blasting, and to have an easy mind, use only EXPLOSIVES, DETONATORS, and SAFETY FUSE manufactured or guaranteed by the HAMILTON POWDER CO.



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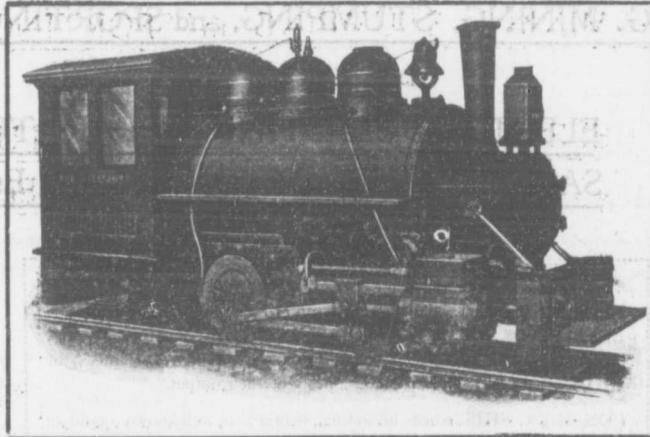
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THE MINERAL PROVINCE OF CANADA.

Gold, Silver, Lead, Copper, Coal, Coke, Oil, Iron, Mercury, Platinum, Etc.

THE MINES OF BRITISH COLUMBIA HAVE PRODUCED NEARLY

\$180,000,000.

AMOUNT AND VALUE OF MINERAL PRODUCTS FOR 1900, 1901, 1902 AND 1903.

	Customary Measure.	1900.		1901.		1902.		1903 Estimated Value.
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
Gold, placer.....	Ounces	63,936	\$1,278,724	48,505	\$970,100	53,657	\$1,073,140	\$1,900,000
Gold, lode.....	"	167,153	3,453,381	210,384	4,348,643	236,491	4,888,269	6,000,000
Silver.....	"	3,958,175	2,309,240	5,151,333	2,884,745	3,917,917	1,941,328	1,500,000
Copper.....	Pounds	9,997,080	1,615,289	27,603,746	4,446,963	29,636,057	3,446,673	4,500,000
Lead.....	"	63,358,621	2,691,887	51,582,906	2,002,733	22,536,381	424,832	500,000
Coal.....	Tons, 2,240 lbs.	1,439,595	4,318,785	1,460,331	4,380,993	1,397,394	4,192,182	5,250,000
Coke.....	"	85,149	425,745	127,081	635,416	128,015	640,075	
Other materials.....	"		251,740		417,238		480,051	500,000
			\$16,344,751		\$20,086,780		\$17,486,550	\$19,200,000

GOLD.—Placer gold mining, which in early days formed the chief mineral industry of the province, and made it famous all the world over, still continues to be important, while improved methods of working the gravel deposits, together with cheaper transportation and cost of mining, have rendered the working of large deposits, long known to exist, now profitable where previously impossible.

The area of country known to contain placer gold is enormous and has only been touched, leaving still virgin ground well worth the prospecting for this, the only class of "poor man's mine."

Recent discoveries of new placer fields in the Atlin district, the Cassiar district, and the large extent of unworked deposits in the Cariboo district, are proof that the field is not yet exhausted, and promise a revival of this important industry.

HYDRAULIC MINING plants costing larger amounts of money are being installed in Atlin, Cassiar, Omineca and Cariboo, at points widely separated, indicating the extent of the gold deposits. One company recovered \$350,000 in gold in 1900.

DREDGING FOR GOLD is receiving deserved attention, and dredges are at work on the Fraser, Thompson, Quesnel and other rivers, on all of which streams good ground may yet be obtained.

LODE GOLD MINING is now being prosecuted in various parts of the province, and in certain instances very successfully, notably at Ymir, Camp McKinney and elsewhere.

GOLD-COPPER ORES are being extensively worked at Rossland by the Le Roi, War Eagle and associated companies, while other mines in the camp are rapidly becoming important producers.

The tonnage of this camp alone in 1902 was 329,534 tons, and there will be an increase this year.

SILVER-LOAD—In 1900 the silver production was \$2,309,200 and the lead production \$2,691,887. Since that time the mining of silver-lead ores has been somewhat suspended owing to temporarily unfavorable market prices.

COPPER.—Copper is being produced to some extent at Rossland, where the chief value of the ore is in gold, but the feature of this branch of the industry is the development and mining of a large tonnage of low-grade copper ore in the Boundary district, of which there seems to be an almost unlimited amount. The output of ore from this district alone amounted to over 684,000 tons in 1903.

The Coast district will this coming year show a very considerable copper production from the Vancouver Island and Texada Island mines.

Prospecting for copper is receiving great attention, and the discoveries made on the Coast, in the Similkameen Valley, etc., give great promise.

IRON.—With the great probability of an iron-smelting plant on the Northern Pacific Coast in the near future, what promise to be extensive bodies of magnetite iron ore have been developed on the Coast, while other deposits of iron ore are now under development in the Goat River and Fort Steele mining divisions, and still other bodies occur near Kamloops.

COAL AND COKE.—In 1901 the Vancouver Island collieries made a net output of 1,173,893 tons of coal and 20,178 tons of coke.

In 1903 the Crow's Nest collieries made a net output of 650,000 tons of coal, and 160,000 tons of coke. In 1904 this output will be doubled at the least. These mines alone are putting out from 1,000 to 2,000 tons of coal per diem.

Of the total output of 1902, 776,808 tons of coal, and 38,780 tons of coke were exported, chiefly to the United States. The remainder was consumed in the local smelters and other industries.

SMELTERS.—In the province there are smelters in active operation at Trail, Nelson, Grand Forks, Greenwood, Boundary Falls, Van Anda, Ladysmith and Crofton; while this coming year will probably see one erected in East Kootenay.

CAPITAL.—Capital can now find here many excellent opportunities for investment, as the values placed on mines and undeveloped properties have reached a reasonable basis. If proper business care is used, and the experience of competent men utilized, these investments should be safe as well as profitable.

MINERAL LANDS.—Mineral lands are open to location to any person over 18 years of age, who has obtained a free miner's certificate, and the perfect title to lode claims can be easily secured after \$500 worth of work has been done per claim. A great extent of territory has yet to be prospected.

For information, reports, bulletins, etc., address

The Hon. the Minister of Mines,

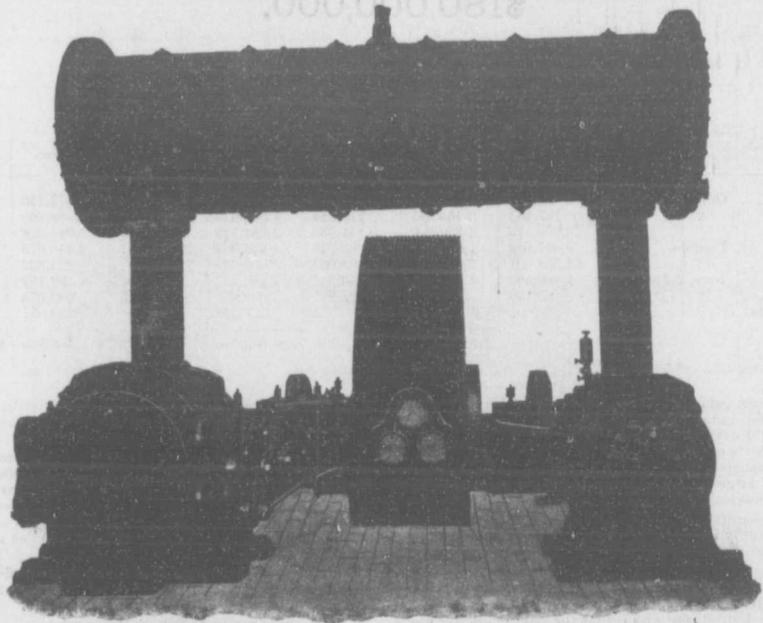
VICTORIA, B. C.

W. F. Robertson,

Provincial Mineralogist,

VICTORIA, B. C.

THE CANADIAN RAND DRILL CO



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Capital, \$3,000,000

Surplus, \$1,450,000

Established in
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3 Per
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WE receive deposits of one dollar and over and pay interest thereon from date of deposit at three per cent.

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