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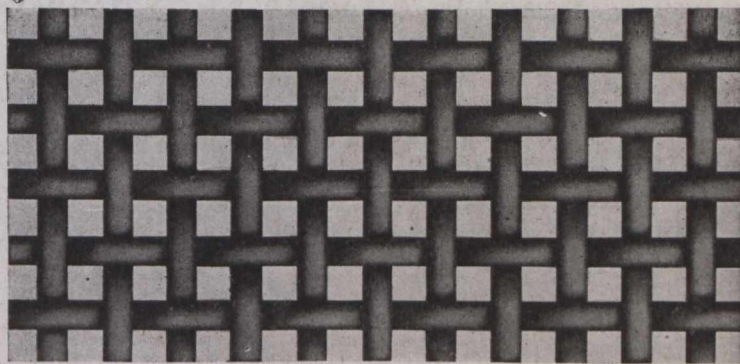


MINING JOURNAL

VOL. XL.

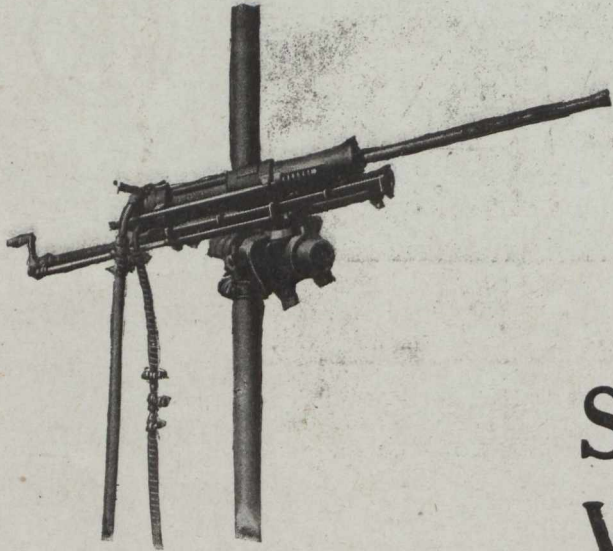
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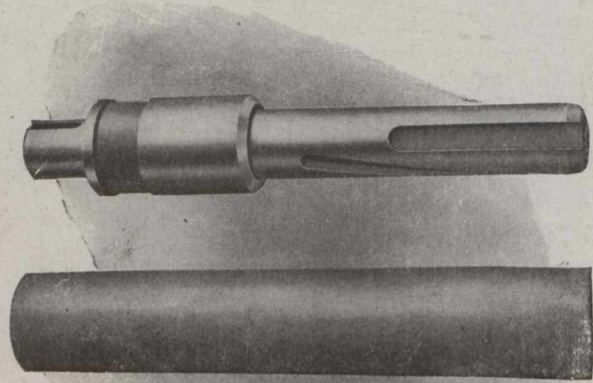
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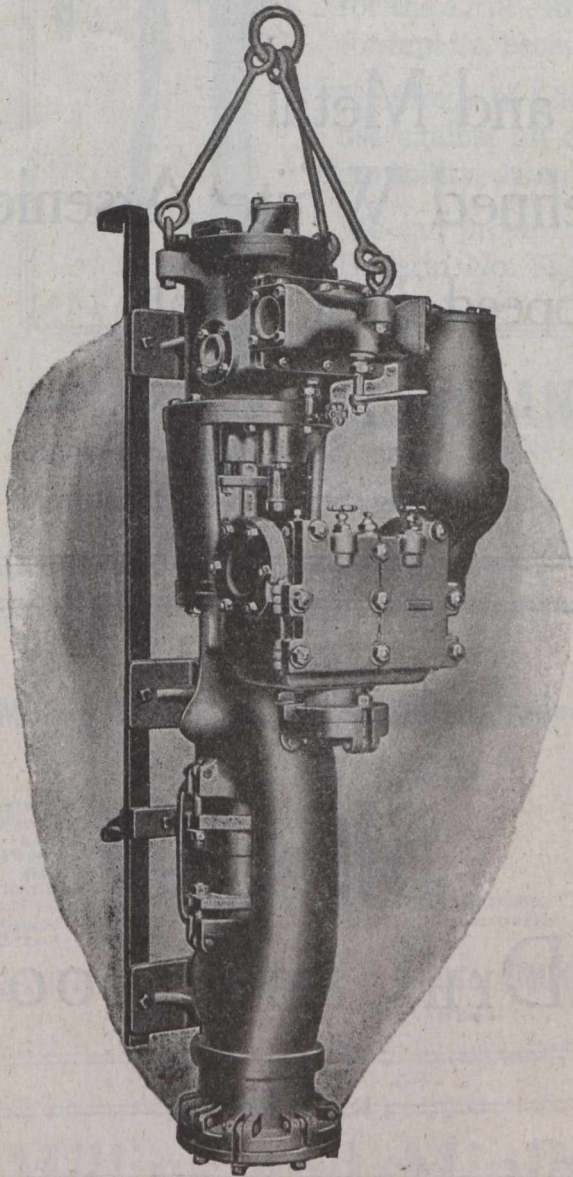




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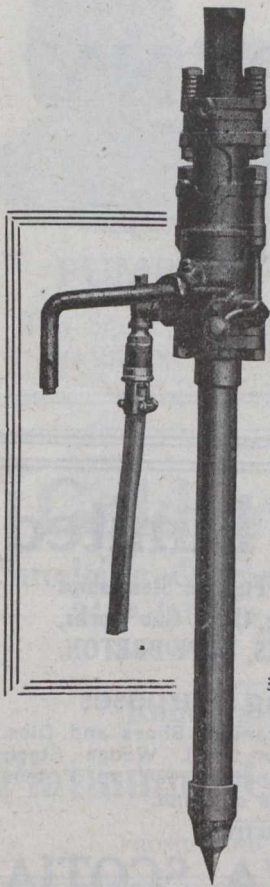
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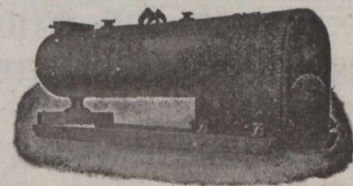
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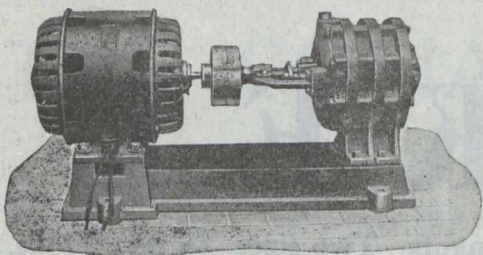


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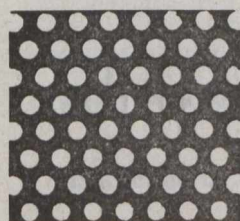
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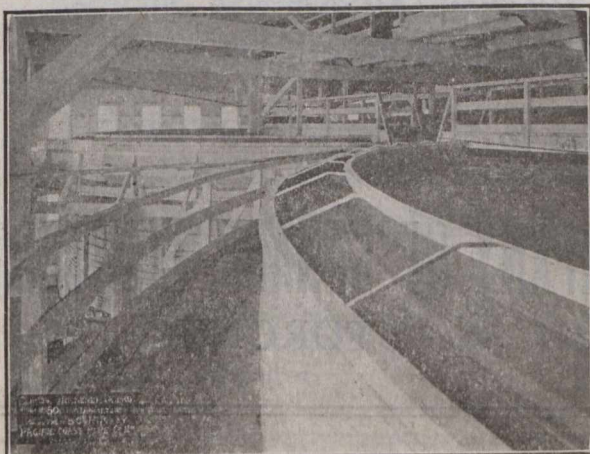
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The Canadian National Railways, recently constructed across Northern and Western Ontario, have opened up for prospecting a large territory. Easy access to many promising areas is now available. Geological maps of some of these areas can be obtained from the Geological Survey, Ottawa.

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MINERALS SEPARATION NORTH AMERICAN CORPORATION

Is the registered owner of the following Canadian patents: Nos. 74,621; 37,700; 94,222; 129,819; 94,516; 96,182; 96,183; 99,743; 127,397; 129,820; 134,271; 135,089; 137,404; 142,607; 147,431; 147,432; 148,275; 151,479; 151,480; 151,619; 151,810; 157,488; 157,603; 157,604; 160,692; 160,693; 160,694; 160,846; 160,847; 160,848; 163,849; 160,850; 160,937; 163,603; 163,707; 163,926; 164,587; 165,390; 166,415; 167,474; 167,475; 167,476; 167,603; 187,263.

On December 11, 1916, the SUPREME COURT OF THE UNITED STATES unanimously adjudged our basic patent for air-froth-flotation to be valid, holding that this patent covers any process of froth flotation wherein the results obtained are such results as are secured by the use of a fraction of one per cent., on the ore, of an oily frothing agent in an ore-pulp, with agitation. Three of the thirteen claims which specified the use of "a small quantity of oil" and which the Court held to be invalid have since, by proper disclaimer, been brought within the scope of the Supreme Court's decision.

On May 4, 1917, in the UNITED STATES DISTRICT COURT OF MONTANA, the opinion of Judge Bourquin was filed in the case of Minerals Separation Ltd., and others against Butte & Superior Mining Company, and was followed by a decree on September 17, 1917, wherein it was adjudicated that the three claims which had been limited by disclaimer were valid and infringed, and that the seven claims adjudged to be valid by the Supreme Court of the United States were infringed. The acts thereby adjudged to be infringement included the use of mixtures of petroleum oils and mineral-froth-forming oils in a total amount exceeding one per cent. on the ore, and also the use of Callow pneumatic cells.

On May 24, 1917, the UNITED STATES CIRCUIT COURT OF APPEALS at Philadelphia, in the case of Minerals Separation, Ltd., against Miami Copper Company, unanimously sustained the validity and broadly construed a second basic patent, owned by us, for the use of all "Soluble Frothing Agents." In the same opinion, the Court also validated a third patent for the use of cresols and phenols in the cold and without acid. The defendants, Miami Copper Company, endeavored to avoid infringement of these patents by using Callow pneumatic cells, but the Court held that the operations of the defendant company infringed all three patents.

On November 11, 1918, the SUPREME COURT OF THE UNITED STATES granted the petition of Minerals Separation, Ltd., and others for a Writ of Certiorari to review the decree of the United States Circuit Court of Appeals at San Francisco which had reversed so much of the decree of Judge Bourquin in the suit against Butte & Superior Mining Company as adjudged to be infringements those acts which employed oil of any kind or character used in excess of one-half of one per cent. on the ore.

Prospective users of our flotation processes are earnestly requested not to be influenced by the views disseminated by interested parties that any of these BASIC PROCESS PATENTS can be evaded by a mere variation of apparatus for agitating and aerating the pulp, or by the simple addition of oils or other materials in excess of a fraction of one per cent. on the weight of the ore treated.

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Engineering Office:
220 Battery Street,
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Canadian Attorneys.

Messrs. Ridout & Maybee, Patent Solicitors, 156 Yonge Street, Toronto, Canada.

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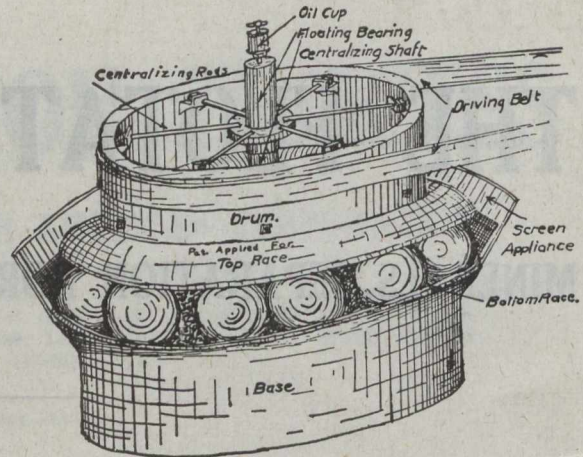
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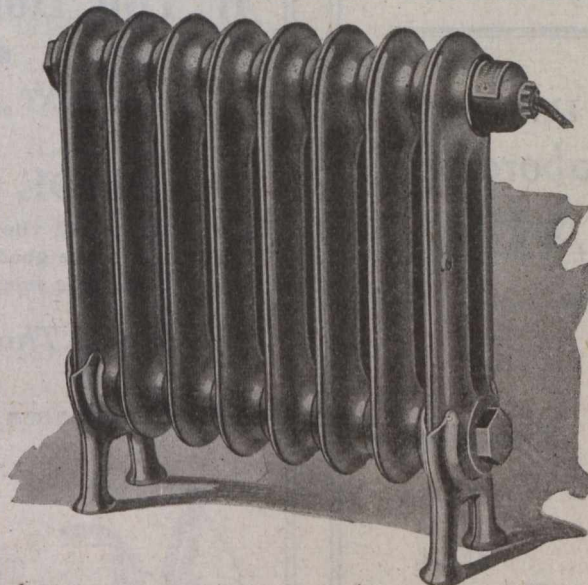
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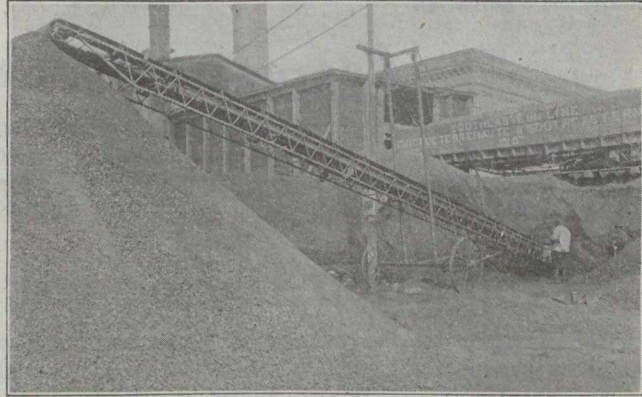
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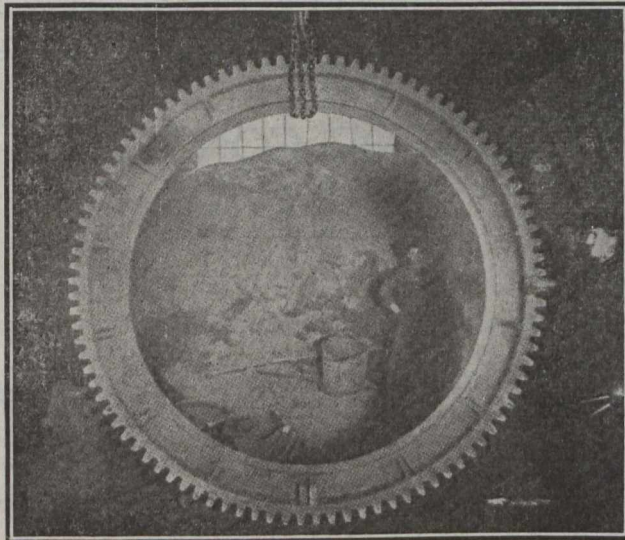
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EDITORIAL

AN OPPORTUNITY FOR THE CANADIAN MINING INSTITUTE TO SERVE THE INDUSTRY.

Great interest is taken in the election for president of the Canadian Mining Institute this year, owing to the feeling that it is desirable that the Institute should play a more important role in the mining industry. In the opinion of many members, an Institute that would exclude others than engineers would be of comparatively little use to the industry. It is true that it would be much better to have such a society than none, and that much good results from purely technical discussion among engineers. It is true also that there would be some advantage to engineers in membership in an exclusively engineering society. Our contention is that the Canadian Mining Institute has a bigger field for usefulness. It has an important place to fill as representative of the mining and metallurgical industries. It should further the interests of its members, not by seeking special privileges for them, but by speeding up the development of our mineral resources, and by guiding development along lines that are in the national interest.

If the Mining Institute is to represent the industry, the members must see to it that the officers of the Institute are active in educating public opinion in regard to mines and mining. There is little use in complaining of the lack of consideration which Governments give the industry, so long as no great effort is made to inform the people who elect the members of parliament. Governments can afford to ignore the mining industry only so long as there is no general appreciation of the advantages that the country reaps from the activity of mining and metallurgical companies. If the Canadian Mining Institute will perform its natural function as the mouthpiece of the industry, the public will be so well informed that Governments that do not feel disposed to take a leading part in the development of our natural resources, will find it advisable to consider whether mining is not an essential industry in this country.

Mining is, next to agriculture, our greatest basic industry; but the people do not yet realize it, and consequently those who represent the people have given the industry little consideration. Few members of parliament show any indication of having more than a child's knowledge of mines, minerals, and metallurgical works, and their importance to Canadians.

Who is to blame for this condition of affairs? If this country were run on the German plan, we might justly lay the whole blame on the governments. We are not sure that Canada is entirely free from Kaiserism; but so far as leadership in developing mineral resources of Canada is concerned, our Federal Governments can well plead not guilty. If we accept the idea that our system of government is a purely democratic one, our Federal Government has good reason for ignoring the mining industry. If the electors do not press for more activity on the part of the Government in developing our mineral resources, the inaction can be expected to continue. Some organization must undertake to inform the electors. The natural organization is the Canadian Mining Institute.

We believe that the most important work for the Canadian Mining Institute during the period of reconstruction is to do what it can to speed up development. Our mineral deposits do not increase with age. Every year we leave the deposits undiscovered and undeveloped, we are denying ourselves the use of our natural wealth. If the public appreciated this, would they not insist on every encouragement being given to mining? Cannot the Canadian Mining Institute do much towards improving the status of mining in Canada, by functioning as the voice of the industry?

What the Mining Institute does during the coming year towards increasing the faith of Canadians in our natural resources and in obtaining greater aid from governments for the mining industry, depends largely on whom the members elect as president. Members at Porcupine and Toronto have nominated Mr. J. B. Tyrrell for this office, because they feel confident that he will devote much of his time to the affairs of the Institute, and because he is an advocate of greater publicity for mining, recognizing as he does that one of the most important duties of the Canadian Mining Institute is to inform the electors and the governments on matters of importance to the mining industry. Moreover, Mr. Tyrrell's work takes him to all parts of Canada, and if he is elected we may expect him to take an interest in mining and metallurgical work in every district.

Those who are supporting Mr. D. H. McDougall for the presidency say:

"Mr. McDougall, a native of Nova Scotia, is President of The Nova Scotia Steel and Coal Co., and has

been actively engaged in the coal, iron and steel industries throughout his professional career. Mr. McDougall has already rendered exceptionally valuable service to the Institute. As President of the Mining Society of Nova Scotia he aided essentially in effecting the amalgamation of this Society with The Canadian Mining Institute during the past year. This is a step which has long been desired, and which materially strengthens the position of the Institute as a national society. Moreover, during the last year, Mr. McDougall took a very active interest and did a large share of the work in the organization of the Iron and Steel Section of The Institute. It is our confident belief that Mr. McDougall's election as President this year is especially desirable not only on general grounds, but also in order to bring both of these measures, to which he has already so largely contributed, into full working effect."

Mr. McDougall is admirably fitted for the office of President of the Canadian Mining Institute. We have no doubt that, he would be able to do much along the lines indicated by those who have endorsed him for election this year. We hope that he will fill the office at some time in the near future; but for the most important work which the Institute could do this year, Mr. Tyrrell appeals to us as the logical president. Mr. Tyrrell is one of those who believe that the Institute should endeavor to be of greater service to the industry, by taking a more active interest in all matters affecting the industry. We know that he can and will give the necessary time and attention to such work. The Institute needs such a president. We admire Mr. McDougall, but we hope that Mr. Tyrrell will be elected.

PROTECTION OF INVESTORS.

It is almost certain that this year is to be marked by great increase in activity in mining and exploration in Canada, particularly in the gold producing areas. Gold mining was unattractive during the period of high prices, but much progress was made by the companies that were able to continue operations. There is every reason to be optimistic for the future. We may expect that many investors will be attracted by the promise of wealth to be gained, and we expect that development of our mineral resources will justify large expenditure. We hope that a larger number of Canadians will take part in this development and share in the profits.

We would warn those who are inexperienced in mining, however, that the development of mineral resources is in the early stages a very uncertain business. In the case of mines that have been well developed and have been producing for some time, there are good grounds for predicting the results of operations for some years ahead. In the case of new properties on which little work has been done,

those who provide funds for development take long chances. They should see to it that they have an opportunity to make correspondingly large profits in case the venture proves a successful one. Those who invest in mining securities should realize that while there are many profitable mines, there are comparatively few like Creighton, Hollinger and Nipissing. The chance of any prospect developing into such mines as these is very, very small. Those who are most familiar with the mining industry consider such properties to be as good security as any industrial enterprise, and better than most. They also consider, however, that such prizes are rare, and that while others such as these will be developed it will only be after many unprofitable properties have been tested.

Development of new properties usually necessitates considerable expenditure before any return is possible. Those who subscribe money to pay the cost of development should see to it that their money is used for development, and that if the venture is successful they obtain profits comparable with the risk they take. Governments can provide some protection for investors by insisting on full publicity of company affairs, so that the investor may be able to judge, whether his money has to earn an unreasonable amount for others before it will be possible to return large profits to the subscribers. But it is scarcely possible for Governments to make such inquiry into every company's affairs as to remove all risks for the investor. The experienced investor finds it advisable to consult reports of expert examinations of properties and to satisfy himself as to the character of the promoters. There are risks enough in developing new properties when the money invested is used in well advised development work.

It is particularly desirable at this time that development be speeded up and that Canadians take a larger part in the development. We hope that those who wish to obtain the co-operation of the public will see to it that the public is given a fair show. Investment in most mining enterprises is properly classed as speculative and investment in undeveloped properties is very speculative. Those who cannot afford to risk losing their money should not be invited to take part in such enterprises. On the other hand, those who are able to risk something in the hope of making large profits should be encouraged to do so. They should be given all the known facts and not asked to believe that they are investing in enterprises that are sure to be successful. Unduly optimistic statements may attract some investors, but such men are not likely to put their money into a second enterprise of the same sort. If we would foster Canadian investments in mining enterprises, we must see to it that everything possible is done to in-

form the public of the risks as well as of the possible gains. There are many who would be willing to risk their money if they were confident that they were given reliable information by promoters. Those who launch new companies would do well to bear in mind that they scare away experienced investors when they describe prospects as mines and when they endeavor to hide vital matters by glowing phrases. There will be more publicly subscribed money for mining when there is more plain talking by promoters.

It is customary to suggest as a remedy for all evils, that the Government do something. In this connection many will claim that the Government should be asked to make a searching inquiry into every new mining and exploration company, and have experts report on the actual value of the shares offered for sale. We believe that the Government might do good by insisting on more explicit statements by promoters; but we do not believe that Governments should be asked, or that they could if they tried, at reasonable expense, obtain all the desired information. It is in the search for information that much money must be spent in exploration and development. Those who find, by an expenditure of money and labor, that a prospect gives promise of becoming a profitable mine, are the ones who should be rewarded for the risks they have taken. Governments cannot give such information. They can, however, help to obtain the desired information and they can well be asked to do more work of the character they are now doing. They can help the prospector by geological maps and reports, by transportation facilities, and by suitable mining laws and regulations, and they can help protect investors by taking a more active interest in the flotation of new companies, and in new offerings by old ones.

A MISLEADING PROSPECTUS.

There has lately been on exhibition in shop windows in Yonge street, Toronto, specimens of silver ore and rocks from the Cobalt district, which serve to draw attention to a company that is soliciting subscriptions to develop a prospect known as the O'Connor property, Coleman township. Concerning this property the salesman interviewed by the writer made some strange statements. We were also presented with a copy of a prospectus, dated December 17th, 1918, and "filed in the Office of the Provincial Secretary of Ontario."

According to this prospectus the property "is located in a rich, proven mining district." An 'engineer' says of the ore deposit that "the vein filling is calcite, cobalt, nickelite, and smaltite." * * * * * "at 6 ft. depth, the vein jumps" * * * * * "the vein is well defined and is one of the strongest fissure veins in the Cobalt Camp."

Now the property is not in the Cobalt Camp and the vein would have to make many 'jumps' to get there. Those who read the prospectus may, however, be satisfied with the statement that the 'engineer' who reports on the property has been informed "on good authority" that another person "took a general sample of the ore from a 58 ft. level and got 520 oz. silver." The 'engineer' fails to state how much ore was taken, but we imagine that the sample weighed at least one ton. It would be of interest to learn how the sample was taken and what its significance is.

We do not doubt that silver has been found on the property and that as a prospect it is worth some attention; but what we learn of the ore deposit from the prospectus it does not impress us very favorably.

Even worse than the description of the ore deposit is the information, or lack of information, concerning what the purchaser of shares gets for his money.

OUR PLATINUM AND PALLADIUM PRODUCTION.

In an article published in the "Toronto World" on Thursday, February 6, Mr. J. F. Black, of Sudbury, calls attention to the production of precious metals. He quite properly emphasizes the fact that proper record is not kept of the precious metals contained in the ores mined in the Sudbury district. The statements published abroad concerning our output of platinum and palladium are very inaccurate, doubtless because of our own failure to publish accurate statistics.

In a graphic representation of the metals output of the British Empire, published recently by a supposedly good authority in England, Canada's output of palladium and platinum is given as a few ounces per year. Actually the annual production is valued at several million dollars.

Very large quantities of these precious metals are mined with the nickel and copper of the Sudbury district. Our Government records do not show what the amount is. Are Canadians so uninterested in their own natural resources that they will not undertake the task of keeping a proper record of production? It would cost something to obtain the exact figures by sampling every shipment, but with the co-operation of the producers a close approximation could be made without great difficulty. From what we can learn, a good deal of the precious metals is lost in the process of treating the matte. As most of the refining is done in the United States and Wales, we have no record of the recovery. Canadians should be advised, however, concerning the amount of precious metals contained in the mine, smelter, and refinery products exported.

Reports of British Columbia Government Mining Engineers

A feature of the Preliminary Review and Estimate of the Mineral Production of British Columbia for 1918, which has just been issued by the department presided over by the Hon. Wm. Sloan, Minister of Mines, are the summaries by the six mining engineers, appointed to the same number of Provincial districts to report upon and to encourage mining development therein, of the work coming within their respective jurisdictions during the past year.

Mr. G. H. Clothier, of the Northwestern District, draws attention to the increase in the production of copper and gold in that section of the Province. He points out that the exceptional showing in respect of the former metal is due to the Granby Consolidated Mining & Smelting Co's operations, while the good showing as to gold lies to the credit of the Belmont-Surf Inlet Mines, the production of which, it may be said parenthetically, is one of the notable occurrences of the year 1918 in this Province from the standpoint of the mining industry. It is pointed out, however, that the placer fields of his district have not yielded as before because of the oft-quoted fact that the value of gold stands still while the cost of everything connected with its production has been soaring.

The output of the Northeastern District is placed at about \$375,000 in value by Mr. J. D. Galloway, Government Mining Engineer. Nothing of special interest is noted by Mr. R. W. Thomson, of the Central Mineral Survey District, although he furnishes particulars of the development of various mining properties which indicate that mining is far from stagnant in that section. Mr. P. B. Freeland, of the Southern Mineral Survey District, states that some 705,000 tons of mixed ore were produced within that district during 1918 and that "considerable activity was shown during the greater part of the year in prospecting for minerals necessary for war purposes." Of this work and its results he promises more details in the annual report. The various mining enterprises of the Kootenays are dealt with in some detail by Mr. A. G. Langley, of the Eastern Mineral Survey District, while Mr. Wm. M. Brewer, of the Western District, which includes Vancouver Island and a part of the lower British Columbia Mainland, observes that, while there has been no phenomenal progress in either coal or metaliferous mining in his district, the advance has been steady.

In introducing his report Mr. Clothier says:

"The output of the district for the year will approximate 837,200 tons, producing 30,908,300 lb. of copper, \$980,000 in gold, and \$282,000 in silver. This is a considerable increase over last year, due to the greater production of the Granby Consolidated of copper, while the increase in gold and silver is accounted for by the very successful year of the Belmont-Surf Inlet Mines, Limited. The output of placer gold will, however, be considerably less than last year.

"The outlook of this district for the coming year is exceptionally good, for it is almost a certainty that the railroad of the Dolly Varden will be adjusted and it will become an important producer. There is every prospect of several smaller properties in that section

also shipping during the coming summer. The Portland Canal section will have a shipper in the "Bush" property this winter, with several other properties showing up well with development. These sections will greatly increase the gold-silver production of this district. The Engineer mines, at Atlin, may also be expected to become a big gold-producer, possibly within the next year.

"With the war over and the return of many of the men who enlisted from this north country, together with others who will be well fitted for the life and alive to the many opportunities of this particular portion of the Province, I look for an extensive revival of prospecting and mining activities."

Under Queen Charlotte Mining Division, he says:

"Some little local excitement was caused at a logging camp on Shuttle island, about six miles south of Lockeport, when the cook discovered gold in the gravel on the beach, and later in small quartz stringers running through the slaty country-rock. No work to amount to anything had been done on the quartz stringers at the time of my visit, but I am informed that the owner is now sinking a shaft on the most likely looking portion. The placer claims on the beach have been purchased from the original stakers and will be worked this winter. The beach gold is, without doubt, the result of the disintegration of the quartz gold-bearing stringers whose gold has been concentrated in the gravel."

Belmont-Surf Inlet and Drum Lummon Copper.

Interesting observations with reference to the Belmont-Surf Inlet Mines, Ltd., the Drum Lummon Copper Mines, Ltd., and the operations of the Granby Consolidated on the Ecstall River are found under "Skeena River Mining Division" as follows:

"The Belmont-Surf Inlet Mines, Limited, operating at Surf Inlet, on Princess Royal island, has been under continuous operation and had a very successful year. The output was 8,209 tons of concentrates, shipped to Tacoma, and yielding 43,328 oz. gold, 27,990 oz. silver, and 451,820 lb. copper, a very satisfactory showing for the first year's operation. Extensive development-work is being carried on continuously, with such successful results that the ore reserves have been largely increased. An ice-breaker has been put on the lake for the winter months, so that there will be no interruption of shipments.

"The Drum Lummon Copper Mines, Limited, has been operating its property on Douglas channel all summer. The main work underground has been the continuation of the drive on the ore-zone, which has now been opened up for a distance of over 200 feet. Considerable ore was broken down on to the drift-level before closing down the underground work for the season. This will give ample material for the mill to experiment with from now until spring. A new compressor, run by a 25-horse-power gas-engine, was installed early in the year and proved ample for all requirements. A small milling plant was erected and had been in operation only one day at the time of my examination. It is equipped with a small jaw-crusher at the head which takes the mine-run of

ore, crushing to about 1 inch size and discharging into storage-bin. Two Gibson type mills, each of 18 tons per 24 hours capacity, are fed from this bin and grind to discharge through a 40-mesh screen, feeding directly to a concentrating-table designed by the manufacturers of the Gibson mill. The whole is run by a 10-horse-power gas-engine. This plant has demonstrated that it will make a concentrate of 62.5 per cent copper, 1.12 oz. gold, 30 oz. silver, running on a feed of 5.9 per cent copper ore. The loss, however, will be very heavy unless some scheme, such as a flotation-cell, is used to treat the slimes and middling product. It is a very creditable little plant and will no doubt be gradually improved and enlarged.

"The claims up the Ecstall river, mentioned in last year's report, have been further explored by diamond-drilling by the Granby Consolidated, who have the property under option. No information is available from the company as to the results obtained. The work was closed for the winter, but will be resumed in the spring. The importance of the success of this property to this part of the Coast cannot be overestimated."

Concentrating Granby's Hidden Creek Ores by Flotation.

Coming to the Nass River Mining Division Mr. Clothier discusses the work of the Granby Consolidated as follows:

"The Granby Consolidated Mining, Smelting, and Power Company, Limited, has exceeded its last year's output of copper, smelted from its own British Columbia ores, by nearly 3,000,000 lb. The amount of ore smelted from its Hidden Creek mines was 828,488 tons, exclusive of limestone and quartz used for fluxing purposes, producing 30,394,109 lb. copper and approximately \$107,000 in gold and \$282,000 in silver.

"The 100-ton 'pilot mill' has been operating steadily all year in experimental work on the concentration of the Hidden Creek ores, as well as ores from the company's Alaska properties. The milling process is confined to flotation alone, and some very satisfactory results have been obtained on the siliceous ores. Good progress has also been made in experiments on the selective flotation of the heavy sulphide ores.

"The company has under way an immense project in the installation of coke-ovens, with all the attendant modern equipment for saving and utilizing the by-products. The plant will cost approximately \$2,000,000, and it is expected it will be in operation early in the spring. The coal-supply for this plant will be obtained from the company's coal property on Vancouver island. The most important prospecting-work the company has undertaken during the year is the exploration of the Ecstall River pyrite-showings. I understand that results from work to date have been sufficiently encouraging to justify further investigation in the spring."

Among other notable prospects dealt with in the Alice Arm Section an interesting reference, as appended, is made to the Standard Group:

"The Standard group of four claims is situated on the south side of McGrath mountain. It is owned by W. McLean and others, of Alice Arm. The showing on the property is an immense vein of quartz, 60 feet wide where exposed by an open-cut along the side-hill, mineralized with zinc-blende disseminated through the quartz in bunches and in bands up to 2 feet in thickness; in fact, it would be hard to break off a piece of quartz that did not show zinc in the whole 60 feet. Further strippings and open-cuts down the

hill expose the same class of ore, but whether it is the same vein or a parallel one is hard to decide from the amount of work done. It is a remarkable showing of zinc sulphide, about four miles from the beach, and ideally located for economical tunnel-mining. The ore, being a straight zinc sulphide and quartz, is a perfect one for concentration."

The country adjacent to the Kitsault River is found very promising. Mr. Clothier says:

"This section was in a fair way to become an important factor in the mining industry of the Province this winter or early next year. The railroad from the beach to the Dolly Varden, partially constructed last year, was practically rebuilt and nearing completion when the contracting company went into liquidation, with the result that the camp of Alice arm and the section tributary to it are tied up for the winter. It is to be hoped that an early adjustment of railroad affairs will be arranged, so that this may have the opportunity of becoming one of the most important mining sections of the Province.

"The Dolly Varden Mines Company owns the Dolly Varden property, about eighteen miles from tide-water on the west bank of the Kitsault river, and the Wolf property, two miles farther up on the east bank of the Kitsault. The Dolly Varden has been extensively opened up by underground development, as described in the Minister of Mines' Report of 1916, and is therefore in condition to start shipping at any time. The ore-bodies have been proven by thousands of feet of diamond-drilling. On the Wolf a tunnel 35 feet long has been driven in on the ore-body, from the face of which a crosscut to the north 50 feet and to the south 10 feet proves the ore-body for a width of 60 feet, with neither wall in sight. Several thousand feet of diamond-drilling has been done, proving the extent of the ore-body and showing it to be of a good milling grade."

High Grade on Big Missouri.

Of the Big Missouri in the Salmon River District, of which considerable has been heard of late, the Resident Engineer states:

"The Big Missouri group, a well-known property belonging to Lindeborg Bros., of Stewart, has undergone during the past season a complete change. Heretofore it has been considered from the standpoint of a big, low-grade-complex-ore proposition, with many difficulties in sight and requiring large capital. Work done during the past season, however, on the two claims adjoining the Mineral Hill group has proven that the same high-grade ore-shoots extend on to the Missouri ground. Fifteen open-cuts were dug all over these claims, with results which were highly satisfactory. Since then the bond has been transferred to D. D. Mann and associates, who, I understand, are planning extensive exploration-work for the coming spring."

The Engineer Mine.

The Atlin Mining Division and the Engineer Mine are next dealt with and, in view of the possibilities of the latter property, one of the most promising of the lode mines of Northern British Columbia, references to it are given in full:

This portion of the Province has been comparatively quiet for the past two years on account of the scarcity of labor and the extreme high cost of everything pertaining to mining. There has been little or no prospecting for mineral and, with the exception of two properties, no development-work. In the placer

areas there is no new ground being opened up, and where working on "pay" the lack of labor is a serious handicap.

I expect to see many of the returned soldiers take to this north country, for the life is suitable and the chances for a "stake" are good. I have no returns yet of the placer yield for the year, but I judge it will be less than last year.

The Engineer mine has been developed to the point where it justifies being exploited on an extensive scale and put in the big producer class. This will naturally stimulate lode-mining in all parts of the section.

The Engineer mine property consists of eleven Crown-granted claims situated on the southern end of Taku arm. It was owned by the late Captain James Alexander.

During the past ten years there has been a great deal of work done by way of surface-stripping, open-cutting, shaft-sinking, mining from the surface, and underground development. This work has exposed on the surface two series of veins, each radiating from a central quartz-mass or "hub," the majority of the veins in each series showing visible gold, and the hubs reported to be of milling grade ore. A 2-stamp mill was operated for several years with ore mined from high-grade surface showings and packed to it on men's backs. The record run for this mill was two hours and a half, producing 24 lb. of gold.

All the underground work, with the exception of the new crosscut tunnels now under way, has been done on the "E" vein, from which a considerable tonnage was mined from the surface. A shaft has been sunk 250 feet, from which four levels have been run on the vein. The first level is from the surface, cutting the shaft at 50 feet below the collar, and extending a further distance of 345 feet on the vein. No. 2 level, 45 feet below No. 1, has been driven 100 feet north and 190 feet south of the shaft; No. 3 level, 50 feet below No. 2, has a drift 210 feet south of the shaft; and No. 4 level, 90 feet below No. 3, has been run 145 feet north and 90 feet south. The shaft is 40 feet below the No. 4 level and shows the vein to be 2 feet wide, with visible gold on each wall. There is a bonanza shoot of ore or from 1 to 6 inches thick, widening in one place to 18 inches, showing on the second, third, and fourth levels for a length of 40 feet. The remainder of the vein, on all the levels, would be considered high-grade ore. In development-work the waste is broken ahead of the ore about 19 feet; the ore is afterwards broken down and taken to the sorting-tables on the surface, where it is broken up and sorted into three grades of ore — that showing visible gold, a second grade which is sacked for shipment, and a third grade sent to the dump for future treatment. The grade showing gold is accumulated until sufficient to run through the ball-mill, 600 to 1,000 lb. being the usual charge, in which it is pulverized in about two hours; mercury is then added and amalgamation completed in from twenty to thirty minutes. The tailings are sacked and shipped with the crude second-grade ore, which averages from \$150 to \$200 a ton. The record run of the ball-mill was 24 lb. 8 oz. of gold from 160 lb. of ore.

A very comprehensive scheme of development has been started. Two crosscut tunnels are being driven — the Mill tunnel from the mill-site on the beach to a point under the shaft on "E" vein, a distance of 1,200 feet, crosscutting in that distance at least five veins from which high-grade ore has been taken on the sur-

face. This tunnel will deliver all ore from "E" vein and intermediate veins to the mill and give a depth of 500 feet at the shaft. It has been driven 309 feet. The other tunnel, called the Boulder Vein tunnel, is being driven from the level of No. 1 level in the shaft to crosscut the upper series of veins radiating from Hub B. Two of these in particular, the Boulder vein and Shaft vein, show bonanza ore on the surface. It will require between 300 and 400 feet of a tunnel to cut them; the whole series will take about 900 feet, giving a depth of 600 feet on the farthest vein. This tunnel has been driven 55 feet, and will deliver all ore from Hub B series to No. 1 shaft level, to shaft to Mill tunnel to mill. The three-compartment shaft at the head of the mill will be sunk to intercept a very rich vein cropping at the edge of the water, which can then be drifted on to Hub A, thus delivering all that ore to the shaft to be hoisted to the mill storage-bins.

The Northeastern Mineral District.

Mr. John D. Galloway has the following general observations to make with reference to the Northeastern Mineral District:

The mineral production of the North-eastern District in 1918 is expected to have been somewhat less than in 1917. The district has as yet few productive mines, although undeveloped prospects and partially developed properties are numerous. Undoubtedly many of these will repay exploitation, but during the last two years conditions have not been conducive to extensive mining development. While it is true that metal prices have been high, this has mainly stimulated actual producing mines and has not induced the development of new properties, except where quick returns were in sight. On the other hand, the scarcity, inefficiency, and high cost of labor, high cost of mining supplies, especially powder and machinery, and scarcity of capital for speculation has had a retarding effect on the development of new mining properties. It may be expected, however, that the return to normal conditions will cause greater activity in this district during 1919.

The copper-output of the district during the past three years has been largely from the Rocher Debole mine, and this year the output from this mine has been less than in former years.

The zinc and most of the silver and lead output comes from the Silver Standard mine; this property is now in good shape to make an increased production in the future.

Considerable interest was shown in the coalfields of the Hazelton-Telkwa Sub-district during the year. The high cost of fuel-oil and the steadily increasing price of coal on the Pacific coast are conditions which have aroused interest in undeveloped coalfields. The Grand Trunk Pacific Railway during the year changed from oil-burners to coal-burning locomotives on the division from Prince George east, and it is quite possible that if a suitable local supply was available the division from Prince Rupert to Prince George would also be equipped with coal-burners.

Production of coal was started late in the fall from the Telkwa Collieries, situated four miles from Telkwa.

The production of placer gold in the district has this year been considerably less than in 1917, due to a shortage of water-supply during the season in the Cariboo Division, the main placer-producing section of the district; thus seriously handicapping hydraulic operations.

The North-eastern Mineral Survey District contains

a large virgin field for prospecting; many areas contiguous to the Grand Trunk Pacific have been partially prospected and claims staked there, but careful examination, such as has been carried out in some of the older camps in British Columbia, has not yet been done. In addition, there is a great deal of country, both north and south of the railway, which is as yet quite unprospected, but in which the general geological conditions are favorable for the occurrence of economic minerals. It is to be expected that the return of many men to the country now that the war is ended will result in a general revival of prospecting. Undoubtedly many of the prospectors who enlisted will return to their old occupation, while the free, adventurous life of the prospector, with its promise of possible spectacular returns, will make a strong appeal to many returned soldiers who before the war had led indoor lives. The North-eastern Mineral District should secure a considerable number of these returned men who are desirous of following such a life.

During the first five months of the year 1918 the Resident Engineer was in the Victoria office engaged in preparing the report of the previous year's work and assisting in the compilation of the Annual Report of the Minister of Mines, as field-work in the district could only be commenced at the beginning of June and be continued until the end of November.

More attention was given to the Cariboo and Quesnel Divisions than in 1917, with the result—as the district is a large one—that less field-work was carried out in Omineca Division than in the previous year. A reconnaissance in the Peace River Division was contemplated for the season, but lack of time prevented this work being effected.

The official returns for the year 1918 are not yet available, but the following estimate, it is believed, will approximate the actual production:—

Gold, placer	4,000 oz.
Gold, lode	900 "
Silver	100,000 "
Lead	155,000 lb.
Zinc	327,000 "
Copper	560,000 "
Miscellaneous minerals	\$4,000
Coal	500 tons.
Total value, approximately	\$375,000

Hydraulic Operations in Barkerville District.

Referring to hydraulic operations in the Barkerville District generally, and to those of some individual companies, as well as to the quartz claims of Proserpine Mountain the report says:

The hydraulic placer mines near Barkerville made a smaller production than in 1917. The water-supply during the year was not very satisfactory, so that a smaller yardage of ground was handled than in the previous year. In the early part of the season the winter's snow melted with great rapidity, causing a flood of water which went to waste, and after that a long dry period occurred, during which there was an insufficiency of water for steady hydraulicking. Not much help was obtained from fall rains, so the season as a whole was unsatisfactory as regards water conditions.

Hopp Mines.—These mines, consisting of Lowhee, Stouts Gulch, and Mosquito Creek, which are operated under the management of John Hopp, were worked as continuously throughout the season as the supply of water permitted. The major portion of the placer-gold production of the Cariboo District comes from

these three properties. Stouts Gulch mine was worked up to its head in 1917, but this year the work was carried on laterally, side channels and benches being worked. There is still a considerable yardage of gravel to work out, but it may prove to be lower grade than the main channel. Lowhee mine was worked continuously throughout the season, and it is reported the average grade of gravel handled was well up to that of former years. Mosquito Creek mine was handicapped by shortage of water, and only a small yield of gold was obtained.

Lightning Creek Gold Gravels and Drainage Co.—

This company carried on work at its property at Wingdam during the season with a force of about a dozen men under the superintendency of Elmer S. Will. The work done consisted of putting the surface plant of the property in shape for actual mining, which is planned for the season of 1919.

The property is an old one and equipped with a plant for deep-drifting placer-mining on a large scale. During the year the flume was rebuilt, giving more water-power, the pumping machinery was overhauled and added to, and generally the whole plant was put in good conditions.

Drilling of the ground, which has been progressing for two or three years back, was continued. The Keystone drill was operated nearly continuously throughout the season, Mr. Brown being in charge of this work.

Proserpine Mountain.—The gold-quartz claims on Proserpine mountain, which are owned by Armstrong, Tregillus, Carey, and Blair, still continue to attract considerable attention. Further development by the owners was carried on during the summer. This work was confined to surface prospecting by cuts and shallow pits. Late in the fall, however, Tregillus and partners commenced sinking a shaft, and it is expected they will continue work all winter.

There are a number of well-defined quartz veins on these claims varying in width from 1 to 30 feet. These veins are mineralized in places with pyrite, arsenopyrite, and a little galena. The main valuable metal content is gold, the distribution of which is somewhat irregular. It would seem probable that the gold primarily was associated with the sulphides, but surface oxidation and leaching have in places scattered free gold through the quartz.

From the results of many samples taken, it is evident that at least portions of the veins would pay to work, and it is quite possible that further development would show considerable tonnages of ore which would pay to mill. The ore will have to be milled on the ground, and much further development is required before a large mill would be warranted. The possibilities for these claims are that when the veins are properly opened up they will furnish sufficient tonnage to mine and mill on quite a large scale, although average values may prove to be comparatively low grade. These properties warrant a thorough investigation by any company looking for gold properties.

The Emancipation Mining Co.

One of the interesting sections of Mr. R. W. Thomson's report on the Central District is his reference to the work of the Emancipation Mining Co., Ltd., which follows:

This company has taken out three shipments during the year and is the only shipper in the district at present. Although exact figures are not to hand, the following particulars are approximately correct: Early

in the year 6 tons was treated at the Tacoma smelter and returned \$6,000; later a shipment of 12 tons was treated at the Tacoma smelter which returned \$1,920. The last parcel of ore sent out was a small one of about 1 ton of hand-sorted high-grade ore which was expected to net about \$2,000 a ton. The tunnel, which has been driven to about 200 feet, still carries milling values in the face, but a winze has been sunk to follow the high-grade seam, which without losing its values narrowed at this point. Prospecting-work has been carried out on the Packard group, owned by this company, with very promising results. On the same lead as the Emancipation group there has been considerable excitement this year owing to the discovery of very rich free gold in the surface quartz of many of the claims. This has caused the staking of the whole lead for nearly eight miles. High-grade ore has been found on the claims owned by Toni Angelis, J. Bailey, W. Palmer, and W. McLean. Claims extend now all the way from the Emancipation group to the Emigrant Mines properties, a distance of eight miles. The past year has been the most promising since the district was first prospected.

The Southern District.

Excerpts of some of the most important parts of Mr. P. B. Freeland's Report on the Southern District follow:

Granby, Consolidated Mining, Smelting, and Power Co., Phoenix.—About 444,500 tons of copper ore was shipped from these mines to the Grand Forks smelter during the year. This tonnage is below that of 1917, chiefly owing to smaller ore-bodies and their increasing distance from the centre of operations. Sickness caused by the Spanish influenza created a shortage of labor and a reduction in tonnage.

Canada Copper Corporation.—The Mother Lode mine operated steadily until about the end of November, when the Canada Copper Corporation ceased operations at their smelter at Greenwood. About 163,382 tons of ore was shipped during this period. The Sunset mine has also closed. About 2,697 tons of ore was shipped.

Camp McKinney.

The Consolidated Mining and Smelting Company of Canada did a considerable amount of work upon its holdings in this camp during the summer. A continuance of some of the quartz leads were uncovered, showing a fair amount of mineralization.

In the fall the West Kootenay Power Company established two camps near the old Cariboo mine and commenced cutting a right-of-way for the high-power electric line which, it is understood, will pass through the McKinney camp on its way from Greenwood to Copper mountain.

Osoyoos Mining Division.

Hedley Gold Mining Co., Ltd.—This company has operated the Nickel Plate mine steadily throughout the year in spite of the increased costs in labor, supplies, etc. About 70,100 tons of ore has been crushed and treated in the company's mill.

Golconda Claim.—In 1917 3,390 lb. of molybdenite was shipped to Ottawa. On driving the main tunnel ahead on the lead, the molybdenite to a great extent disappeared and a good grade of chalcopyrite was encountered. Transportation difficulties prohibit shipping any low-grade ore from this property. About 10 tons, carrying 18.1 per cent copper, was sent to Trail.

Similkameen Mining Division.

Canada Copper Corporation, Ltd.—The chief ener-

gies of this company during the year have been confined to building a 2,000-ton concentration plant at their mill-site, situated about four miles from Princeton. In connection with this plant, the erection of houses for their employees, a school-house, and every facility necessary for the welfare of families has been thought of. A branch of the Kettle Valley Railroad from Princeton to Copper mountain is under construction at the present time.

At the mine, on Copper mountain, work practically ceased during the summer; all the development-work having been done that was necessary until the concentration plant has been installed. A more detailed account of this mine and its mill will appear in the 1918 Annual Report of the Minister of Mines.

Tulameen River.

The strong demand for platinum caused a great deal of activity in the vicinity of the Tulameen river. Besides numerous small placer-workers, the Munitions Board, of Ottawa, under the direction of G. S. MacKenzie, did a considerable amount of drilling, with the intention of ascertaining the possibilities of working the gravels profitably for platinum.

It is improbable that the price of platinum will keep up to its present price for any length of time, but the drilling of these gravels and the ascertaining of the quantities, if any, of platinum is seemingly necessary, to provide against any such contingency as that which arose during the period of the war.

Olivine Mountain.

A Vancouver syndicate obtained some holdings on this mountain early in the year, and prospected it, with a view of mining certain localities for platinum and chromite. Some segregations of the chromite have been found to contain platinum in small quantities, but these segregations are so scattered that profitable mining is at present out of the question.

On the north side of Olivine mountain some good showings of copper sulphides and carbonates have been uncovered by Andy Jensen, of Tulameen. Assays from these showings run up to 4 per cent copper. This locality is worth of some investigation.

The Eastern District.

Mr. A. G. Langley, of the Eastern District, includes in his report the following interesting notes:

Sitting Bull.—Very little work has been done on the property during the year by the owners, pending the installation of a compressor plant, which they propose to make as soon as the new road up Boulder creek is built. The future development-work will consist of driving an adit-tunnel at a location easily accessible and free from snowslides to tap the vein at a depth. Ore is exposed in the upper workings along the apex of the vein, but on account of the rugged and steep nature of the country these workings cannot be mined with safety during the winter months. Some 300 sacks of high-grade silver-lead ore are ready for shipment.

Trojan Group.—This group comprises six claims and is situated on Boulder creek at a distance of eighteen miles from Athalmer, the nearest point on the railway. Access is gained by a good wagon-road to within three miles of the property, and for this distance there is a good 4-foot trail. The property formerly known as the Delos group was bought by the Trojan Mining Corporation, a company promoted in Seattle by F. Wonn, who is also largely interested in the Sitting Bull mine. E. D. Smith is in charge of the development-work. The ore occurring in the quartz-filled vein is principally chalcopyrite, with occasional

values in gold and silver. A sample of ore from an open-cut on the surface ran as follows: Gold, a trace; silver, a trace; copper, 15.5 per cent. There were between two and three car-loads of ore ready for shipment, and the manager now reports that he has nearly 300 tons available, and which he hopes to haul out during this winter. During the year development has been confined to surface work along the outcrop and to the continuation of the old tunnel. Surface improvements consist of commodious camp buildings suitable for a crew of about twenty-five men. The new road up Boulder creek, which has been completed for a distance of five miles, leaves the main road up Horse Thief creek at a point of 7.4 miles from Wilmer.

Fort Steele Mining Division.

Sullivan.—This mine, which is by far the largest producer of lead and zinc in British Columbia, has been steadily operated by the Consolidated Mining and Smelting Company, who report that there is an immense tonnage available for extraction and treatment. The output of this mine, which could be worked to much greater capacity, just about equals the total output of lead and zinc of all the other mines in the Province. Latterly about 300 men have been employed at the property. Shipments for the year are as follows: Lead ore, 30,554 tons; zinc ore, 96,950 tons; and iron pyrites, 4,582 tons. The long adit-tunnel which is being driven from Mark creek is now in about 7,600 feet.

Ainsworth Mining Division.—Near Ainsworth.

Bluebell.—This mine has been operated steadily during the year under the management of S. S. Fowler. On account of a large flow of water, work has been discontinued in the lower workings of the mine, pending the installation of a new pump. The concentrator has not been run during the year, the output of the mine being derived from a large body of oxidized silver-lead ore on the surface. This was extracted by "glory-hole" method and taken out through an adit-tunnel. During the year over 5,000 tons of crude ore was shipped to the Trail smelter.

Florence.—This property, consisting of eight Crown-granted claims, is owned by the Florence Silver Mining Company, of which F. R. Wolfle is manager and F. Hewer mine superintendent. The mine is developed by means of over 10,000 feet of underground workings. The concentrator, which is situated on the shore of Kootenay lake, is said to have a capacity of 150 tons. Water-power to run the plant is developed on Woodberry creek under a 350-foot head. A large gang of men was employed by the company during the year, and over 2,000 tons of silver-lead-zinc concentrates was shipped to the Trail smelter.

Near Kaslo.

Cork-Province.—Mining and development work have been actively carried on during the year under the management of W. E. Zwicky. The production shows a substantial increase over that of last year. A Minerals Separation flotation plant consisting of fourteen 12 x 12 cells, three Wilfley tables, a Dorr classifier, and other equipment was added to the mill during the year. About 800 tons of silver-lead concentrates has been shipped to Trail during the year. Latterly the property has been temporarily closed down.

Curle Manganese Group.—This property, which is situated on the Kaslo & Nakusp Railway at a short distance from Kaslo, was partly developed by Col. Millard, of Spokane. The first shipments contained such a high percentage of moisture that it was found neces-

sary to install a dryer. The results evidently did not meet with much success, and after shipping fifteen cars of ore the property was closed down in October. The ore runs from 34.5 to 49.5 manganese, is low in silica and iron, and may be classified as a good grade of wad. It is possible that the failure to make a success of the venture may be attributed to unfamiliarity with mining and treatment methods for this class of ore.

Sandon Camp.

Conditions in the Sandon camp have been better than for many years past, and the prospects for a large increase in production from the surrounding district is most encouraging, providing market conditions remain favorable.

Clarence Cunningham, who has been carrying on progressive mining and development work at his various properties, has done a lot to stimulate the industry in the Slocan and elsewhere.

Besides the Queen Bess, which is proving to be one of the richest mines in the Division, he is operating the following properties, in which, all told about 250 men are employed: Idaho-Alamo, Sovereign, Wonderful, Van-Roi, Hewitt and Wakefield.

At Alamo a 150-ton concentrator is nearing completion. The plant will be operated by water-power developed from the North fork of Carpenter creek.

The Surprise Mining Company has also been very active this year, and recently acquired the Ivanhoe group and adjoining claims of the Adams group. The company is also operating the Bosun mine, where sixty men are being employed. The ore from this mine is concentrated at the Rosebery mill. The entire output from the properties operated by this company is shipped to the United States for reduction, under arrangements of a long-term contract.

Slocan Star.—This mine is now being operated by the Silversmith Mines, Limited, under the management of R. H. Stewart. A large shoot of ore was recently developed on the tenth level, which is the lowest point in elevation in the Sandon camp at which ore has been developed. After nearly a year's idleness the mill was again started in October, and it is to be now hoped that the mine will once more rank among the leading producers of the district.

Silverton Camp.

This camp has been a little quieter than usual on account of the temporary close-down of the Standard mine, which for many years has been the leading shipper of the Slocan. However, further development-work is being done, and it is to be hoped that before long it will again become one of the large shippers. In the meantime the mine is being partly worked under lease by L. McPhee and partner. Small shipments are now being made to Trail.

Echo.—This mine, situated above the Standard and on the same lead, promises to be an important shipper in the near future. Arrangements have been made to lease the Standard mill, and a tramway has been built from the mine to connect with the Standard tram. J. P. Bonner is mine superintendent.

Queen.—This property, together with the Vancouver Kootenay Belle, and Alexandria claims, has been bonded by A. W. McCune, of New York, who has for many years taken an active interest in the mines of the Kootenay district.

Due to economic conditions brought about by the high price of labor and supplies, the Queen closed down in 1916, having produced up to that date over a mil-

lion gollars in gold. Work has been commenced on a crosscut tunnel running south-easterly across the various properties. The erection of a 200-ton mill is contemplated, should the development come up to expectations. The above may be considered the most important development-work now taking place in the Nelson Division, and will have a far-reaching effect on the Sheep Creek camp.

The following is a list of shippers of the Slocan Mining Division, giving the approximate tonnage shipped or milled by each property during the year:—

	Ore Tons.
Anna group, Sandon	17
Best, Rambler	37
Canadian, Sandon	11
Echo, Silverton	90
Freddy Lee, Sandon	40
Gem, Sandon	70
Idaho-Alamo, Sandon	127
Ivanhoe, Sandon	53
Jo-Jo, Three Forks	10
Lucky Jim, Zincton	6,450
No. 1, Sandon	81
Noonday, Sandon	5
Payne, Sandon	72
Queen Bess, Sandon	2,710
Rambler-Cariboo, Rambler	10,000
Reco, Sandon	19
Richmond-Eureka, Sandon	66
Silversmith, Sandon	2,940
Sovereign, Sandon	84
Surprise, Sandon	
Bosun, Sandon | . . . . .	16,500
Wonderful, Sandon	32
Standard, Silverton	45,000
Galena Farm, Silverton	15,000
Van-Roi, Silverton |	
Hewitt, Silverton | . . . . .	8,000
Lucky Thought, Silverton	129
Molly Hughes, New Denver	19

Rossland Camp.

The output of the Le Roi-Centre Star group has exceeded that of last year, although the production of these mines was greatly curtailed during the latter six months of the year on account of economic conditions not being favorable for the mining and treatment of low-grade ores.

Of the other mines, the production of the Le Roi No. 2 shows a substantial increase over that of last year, while that of the White Bear compares favorably with the previous year.

The Velvet mine has been taken over by the Granby Consolidated Mining and Smelting Company, who have had a crew of men steadily employed at development-work.

The following list shows the approximate amount shipped by each property during the year:—

	Tons.
Centre Star-Le Roi	89,374
Le Roi No. 2	18,416
White Bear	1,408

Revelstoke Mining Division.

Lanark.—A hydro-electric plant capable of developing 250 horse-power has been installed on the Illecillewaet. The power is used for running the concentrator and the compressor at the mine. Operations at the mine consisted of further development-work and the prospecting of a new lead which shows up strongly

on the surface for a distance of approximately 200 feet. W. B. Dornberg is manager. Ten or twelve men are employed.

Woolsey Group.—Situating on Silver creek at a distance of seven miles from Albert canyon. A good trail from the Illecillewaet river to the claims was completed, as was also a bridge across the river. Quite a little excitement was created by reports of the property being bonded to the Mining Corporation of Canada. C. E. Watson, general manager of the company, was prepared to proceed with the development of the claims under an option and upon the recommendation of his engineer, R. O. Randolph. Both of these gentlemen lost their lives in the wreck of the "Princess Sophia," and it is reported that the deal has fallen through. Cabins have been erected on the claims and everything is in readiness for next season's work. The vein is strong and well defined, having a width in places of about 15 feet and containing some excellent exposures of silver-lead ore near the surface. The continuity of the ore has still to be proven by further development; very little prospecting has been done on the vein so far. The ore is principally galena, with a little zinc-blende. The silver values run as high as 80 oz. The zinc and lead are not intimately mixed, while the gangue is quartz, conditions which made it an ore admirably suited for concentration.

The Western District.

General conditions during the year are summarized by Mr. Brewer, of the Western District, as follows:

During the past year, while there has been no phenomenal progress in coal and metalliferous mining in the district, there has been a steady advance, which would have undoubtedly been more marked except for the difficulty in obtaining capital, labor, and bottoms for the shipment of ore to Coast smelters. The epidemic which raged throughout Canada and the United States during the last quarter of 1918 had a very marked effect on the mining industry generally, as in many camps there was fully one-third of the normal force of workmen absent from work either by reason of their own sickness or because of sickness in their families. This was particularly noticeable with regard to the coal-mines and the Britannia copper-mine.

The high cost for labor and supplies, together with the difficulty in obtaining capital, deterred the prosecution of much development-work in metalliferous mines, but to a great extent this has been offset by new development-work that has been done by the colliery companies of Vancouver island, which will be referred to in detail later in this report.

At the beginning of 1918 it was anticipated that the lack of smelting facilities in this district, owing to the closing-down of the Ladysmith smelter during the later part of 1917, would be removed by that smelter being blown in early in 1918, but all hope from that source had to be abandoned, as the smelter has remained idle except during a few weeks last summer, when about 2,000 tons of copper-gold ore that had accumulated earlier in the year was smelted, after which the plant was again closed down and is still idle.

Wages paid to all classes of miners have advanced steadily during the year, and to such an extent that many coal-miners are receiving as much as \$10 a day and upwards, and the minimum wage since the last increase made on November 1st is about \$5 a day. Wages in the metalliferous mines have been advanced

from time to time during the continuance of the war to keep pace with the advancing price of metals. This fact has had a deterrent effect on the progress of gold-mining, because the price of that metal is fixed and does not fluctuate, but, so far as this district is concerned, gold-bearing ores are rarely found, except such ores as carry gold values in association with other metals, and generally the gold content in such ores is very low.

Fortunately there have been no labor troubles that resulted in strikes in this district during the past year, although such were threatened, but the questions in dispute were settled by conferences in which the employers, employees, and Government officials participated.

Early in the year there was considerable agitation with regard to promoting the iron and steel industries in the Province, and as the great bulk of the known iron-ore deposits that occur in British Columbia are found on Vancouver and adjacent islands, this movement naturally created much interest in this district. It resulted in the engagement of Dr. Alfred Stansfield, of Montreal, by the Hon. the Minister of Mines to investigate and report on the possibilities and feasibility of smelting the magnetite ore in electric furnaces. The report has not yet been published, so it is impossible to discuss it in this preliminary statement.

The discovery of a good grade of manganese ore in deposits which promise to develop into ore-bodies of considerable extent was made in the mountains adjacent to Cowichan lake, Vancouver island, during the past summer. Owing to the demand for ferro-manganese on account of the war, this discovery created a good deal of interest, which, however, abated to a great extent when the armistice was signed. The future importance of the occurrence of this mineral will now depend upon demand and supply, which govern the markets of the world, and whether the demand for ferro-manganese on the Pacific coast is sufficient to warrant the erection of furnaces in British Columbia to supply the demand. A large number of samples taken by different mining engineers from the Hill 60 group of mineral claims, which contain the deposits most easy of access, assayed from 40 to 50 per cent manganese, with the silica content of those samples between 13 and 18 per cent, with no iron or phosphorus.

Considerable prospecting was done during last summer for molybdenite ore, and occurrences of that ore were found on Buttle mountain, near Cowichan lake, Vancouver island, also on the mainland near Agassiz, and on the upper Stave river, as well as in the Cheam range, about twenty miles east of the town of Chilliwack. The development-work done on the various mineral claims that contained deposits of this ore was quite limited in extent and no production was reached.

The development-work done on metalliferous mines in the Western Mineral Survey District during 1918 was confined principally to the Britannia, Marble Bay, Sunloch, Old Sport, Monitor, Indian Chief and Blue Grouse mines, which will be further referred to later in this report.

There was a discovery of seepages of oil in the vicinity of Burnaby lake in the spring of 1918, on Land Section 130 in the south-east corner of Burnaby Municipality. The seepages were examined by the writer during the early part of May, and a sample taken showed from analysis that the oil has a paraffin base. The pool sampled was at the root of an old tree, about

4 feet deep and full of oil and water. The seepages appear to occur along a zone where holes had been sunk with a post-auger by J. B. Woodworth, lessee of the land section, some to a depth of 15 feet, in peat marsh, and oil-seum was noticeable on the surface of the water in several of the holes in the marsh.

Later in the year the lessee and associates organized the Spartan Oil Company, Limited, and after securing the advice of W. R. Jewell, Kansas City, U.S.A., geologist and petroleum engineer, decided to bore a test-hole with a diamond drill at the point selected by Mr. Jewell. This work is progressing at the time of this writing, the drill having reached a depth of 875 feet, with the core showing that the drill is boring in sandstone at that depth.

Copper ore carrying varying values in gold and silver was shipped during 1918 from the following named mines in the Western Mineral Survey District: Britannia, Marble Bay, Blue Grouse, Ingersoll, Indian Chief, Monitor, Willow Grouse, and East Sooke. The Britannia and Marble Bay were the only regular shippers, the other mines mentioned being irregular or spasmodic. During the coming year it is expected that the number of shipping mines in this district will be increased by the addition of the Sunloch, on Jordan river, and possibly the Yreka and Old Sport, on Quatsino sound, as well as the Lucky Four, in the Cheam range, near the Canadian Northern Pacific Railway.

Iron ore was shipped during 1918 from the bog-iron ore deposit near Mons, on the Pacific Great Eastern Railway, and from the Good Hope mineral claim, on the east coast of Texada island, all of which was treated at the Irondale furnace, in the State of Washington.

The Britannia Mine.

After devoting considerable space to coal mining operations Mr. Brewer describes the activities of the Britannia Mining Company, one of the big producing concerns of the Province, as follows:

Britannia Mine.—The operations of the Britannia Mining Company are, of course, far more important than those of any other company in the Western Mineral Survey District, and for that reason the following description of development work and improvements that have been carried on during 1918 are given in more detail in this preliminary report.

The following shows the development work performed in the mine: Drifts, 9,837 feet; crosscuts, 4,427 feet; raises, 8,754 feet; chutes, 1,541 feet; winzes, 36 feet; total, 24,595 feet.

Development-work.—In the Fairview mine drifts have been extended on previously developed veins, also new ones have been opened up to the south, on which stoping operations have started. The outside glory-holes were worked during the open season (seven months), breaking ore on top of the mountain into large transfer rock-chutes delivering it to the underground crushers with but one handling.

The Bluff mine to the west and the Empress mine to the east of the Fairview have been extensively developed during the year and stoping has been started. Two drifts are being driven west under the Jane mine on the 1,200-foot level, developing this ore-body 200 feet below any previous working-level.

During the year another connection through Britannia mountain was made, this being on the 600-foot level, making the fourth level to have portals on both the north and south side of the mountain. Two other levels, the 1,200 and 1,600, are being driven through

for connection, the former having approximately 1,600 feet to go and the latter 700 feet.

Work is progressing for the extension of No. 1 shaft from the 1,000-foot level to the 700-foot level, and also the extension of the Grandview shaft (No. 3 shaft) from the 500-foot to the 700-foot level. This construction will in time supplement the No. 2 shaft, now operating between the 1,000-foot and 500-foot levels.

A crosscut adit, 8 x 8 feet, known as the Victoria tunnel, to the east of the present Empress workings, at the elevation of the 1,800-ton level, has been advanced 400 feet to prospect the extension of the veins in that section of the property. Another crosscut, 8 x 8 feet, known as the Hillside tunnel, is being driven at a point west of the present Jane mine at an elevation of the 1,000-foot level. This has advanced approximately 200 feet.

Considerable diamond-drilling has been done during the year, prospecting new areas and also to prove the extension of known ore-bodies. The footages driven in the different mines are as follows: Fairview, 15,062 feet; Empress, 4,897 feet; Bluff, 2,404 feet; Jane, 2,071 feet; 3,100-foot tunnel, 690 feet; 2,700-foot tunnel, 1,558 feet; total, 26,682 feet.

The 4,100-foot level tunnel, the portal of which is about the level of the roof of the mill, was advanced 1,735 feet during the year, making the total length 4,220 feet. This tunnel will eventually be used as the main haulage adit. A raise has been started at this level and driven a distance of 100 feet. This raise will be continued to the 3,100-foot level, a distance of 1,130 feet, and from there to the 2,700-foot level, 370 feet. This raise is 7 x 12 feet and is being driven on a 65-degree slope.

The 3,100-foot level east drift was advanced 659 feet, and from this drift another drift 260 feet long has been driven to the location of the proposed raise from the 4,100-foot level, from which point it is proposed to raise to the Armour crosscut, 2,700-foot level, at the westerly end of the tunnel railway. The Armour crosscut has been driven a distance of 502 feet.

The raise from the 4,100-foot level to the 2,700-foot level will be used to transfer the mine ore to the 4,100-foot level, and thence a distance of about 5,000 feet by railway to the mill.

The 2,200 Daisy tunnel was advanced 910 feet, making the total length 1,309 feet, and a crosscut 106 feet long driven to the south.

The Harp tunnel was advanced 811 feet to completion during the year. This tunnel is 2,246 feet long and will be used to divert water for power purposes.

The following tunnels driven for development-work were advanced during the year: Lantz tunnel, advance for year, 60 feet; footage to date, 890 feet. Lloyd tunnel, advance for year, 71 feet; footage to date, 134 feet. Copper mountain tunnel, advance for year, 152 feet; footage to date, 324 feet.

Equipment.—Four Westinghouse 3½-ton storage-battery mine locomotives were added to the previous equipment of eight, in addition to which there are in the mine one 6-ton General Electric trolley locomotive and two 3½-ton Westinghouse trolley locomotives.

Fifty-four 2-ton automatic side-dump cars were added to the mine equipment, making a total of approximately 150 cars of this type. Besides these, twenty cars of the same type and size, but built for a 3-foot gauge, were added to the equipment for handling ore broken on the 2,200-foot level and for outside tunnels having a 3-foot gauge.

The present equipment of the tunnel railway consists of ten 20-ton bottom-dump cars; twelve 20-ton side-dump cars; two flat cars; four 15-ton electric locomotives; one 8-ton electric locomotive; and one 40-ton electric locomotive. The 40-ton locomotive was added during the year.

The present equipment of machine-drill sharpeners, including those located at outside tunnels, as well as at the mine proper, consists of nine Leyner machines, four Sullivan, and one Waugh.

A 3,600-cubic-foot-per-minute compressor, driven by a 600-horse-power output motor, was installed in the Beach power-house.

No new buildings were erected at the mine, with the exception of a concrete storage or root house; outside dimensions 38 x 30 feet, with an inside height of 9 feet at the crown of the arched roof. This is located at the tunnel cook-house and affords an excellent place for the storage of winter vegetables.

Profits of B. C. Mining Companies.

The following statement shows the dividends declared by operating metalliferous-mining companies during the calendar years 1914, 1915, 1916, 1917, and 1918:

The amount of \$2,691,592 shown above as distributed profits for the year 1918 by no means represents the total of net profits earned during that year. A glance at the published accounts of several of the companies for their respective last fiscal years will make it clear that in these several instances there was as well a substantial sum placed to the credit of Profit and Loss Account.

It will be noticed that the Standard Silver-Lead Company suspended dividends in 1918, although the company operated and made a profit. None of the coal companies are listed as dividend-payers, but doubtless profits were made. Similarly, profits accruing to small companies and individual mining enterprises as a rule are not given publicity as dividends as is the case with the large companies, so that no record of these profits, which in the aggregate are considerable, is available.

Name of Company.	1914.	1915.	1916.	1917.	1918.
Consolidated Mining and Smelting Co., Trail.... \$	464,376	\$ 493,425	\$ 841,050	\$ 996,503	\$ 047,744
Granby Co.	449,955	449,955	1,049,896	1,499,848	1,499,848
Standard Silver-Lead Mining Co., Silverton.....	475,000	250,000	600,000	300,000	.....
Hedley Gold Mining Co.	300,000	300,000	240,000	240,000	144,000
Le Roi No. 2, Ltd., Rosslund . . . . .	.....	58,440	.....	29,199	.....
Rambler-Cariboo Mines, Ltd., Three Forks.....	.....	35,000	70,000	35,000	.....
Utica . . . . .	.....	.....	.....	64,000	.....
Mother Lode . . . . .	.....	.....	137,500	.....	.....
Totals	\$1,689,331	\$1,586,820	\$2,938,446	\$3,164,550	\$2,691,592

Developments in Northern Manitoba

Survey for the Railway From The Pas to Flinflon Copper Property.

The reconnaissance survey for the railway from The Pas to the Flinflon copper property has been completed by J. P. Gordon, acting for the Canadian National Railway. There were two alternative routes in mind. The first was in a northerly direction from The Pas to Cranberry Portage, at the east end of Lake Athapapuskow, and thence westwards along the north shore of Lake Athapapuskow to the Flinflon property. This route, although somewhat longer, would have the advantage of passing through a part of the mineral belt east of Lake Athapapuskow where several discoveries have been made, and where the proximity of the railway would lead to rapid development. The other route follows the west shore of Lake Athapapuskow and thence northwards past the Mandy property to the Flinflon area. It has been found that this is the more practicable route, as a line along the north shore of Lake Athapapuskow would necessitate very heavy building across the strike of the rock. As the railway would touch the west arm of Lake Athapapuskow, which is throughout a navigable lake, the property along the shore of this lake would be connected by water with the railway.

Developing Copper Deposits Along H. B. Railway.

Interest has been recently taken in copper properties in close proximity to the Hudson Bay Railway from Mile 168 to Mile 195. Prospecting has been carried on here for the last four years, and high values in copper have recently been obtained at a depth of 60 feet. The transportation situation is very attractive. It is understood that deals are going through which will lead to early development. These claims are also of interest in that they indicate the continuation of the copper belt considerably further east than good values have previously been obtained.

C. P. R. May Tap Western Section of Pas Mineral Belt.

It is also of interest that the Canadian Pacific Railway authorities contemplate the building of a railway from Lanigan northwards to Cumberland House on the Saskatchewan River. It would appear that this projected railway is pointing northwards into the western section of the mineral belt.—R. C. W.

CANADIAN MINING INSTITUTE.

The following will be elected by acclamation as Members of Council of the Canadian Mining Institute:

Vice-Presidents: Balmer Reilly, Cobalt, Ont., and John T. Stirling, Edmonton, Alberta.

Councillors: J. A. Allan, Edmonton, Alberta; R. C. Wallace, The Pas, Man.; Thos. Cantley, New Glasgow, Nova Scotia; Alfred J. Tonge, Glace Bay, Nova Scotia; Robt. A. Bryce, Toronto, Ont.; E. T. Corkill, Copper Cliff, Ont.; Geo. H. Gillespie, Madoc, Ont.; Jas. G. Ross, Montreal, and H. T. Russell, Montreal.

Mr. D. H. McDougall has been re-elected a member of council of the Engineering Institute of Canada.

A. I. M. E. ANNUAL MEETING.

Lessons learned from the war by the American mining world will be applied toward greater progress in American mining at the 119th Meeting of the American Institute of Mining Engineers, which will be held in New York during the week of February 17th. Prominent members of the Canadian Mining Institute, National Research Council, the American Institute of Electrical Engineers, will join the American mining experts in their discussions.

At no period in the history of American mining have the problems of production, especially as to labor and scientific processes, been so momentous as to-day, and at this meeting important readjustment plans will be presented. The program calls for ten business sessions, at which some forty subjects will be presented; a number of social features of a metropolitan kind, and an all-day excursion to the Federal Shipyard in Newark Bay where the first electric-welded ship is being built.

It is expected that this meeting of the Institute will be attended by mining experts from every state in the Union, and from a number of foreign countries, who are identified with the most important mining operations now going on. Many of these men have in the past two years been serving the Government in their respective fields, and scores of them have been dollar-a-year men at Washington.

At the joint session with the electrical engineers there will be six important papers on the subject of electric-welding. Some of these officials of the National Research Council and Emergency Fleet Corporation, who have participated in the development of electric-welding which has made great strides forward in the war work of the last two years.

The Institute meeting will open on Monday morning, February 17th. Tuesday will be Canadian Mining Institute day, and Wednesday will be featured by the session with the electrical engineers and the National Research Council session, followed by the annual banquet in the evening. The excursion to the shipyards will take place on Thursday, February 20th.

The officers of the American Institute of Mining Engineers are: Sidney J. Jennings, President; L. D. Ricketts, Philip N. Moore, Past Presidents; C. W. Goodale, First Vice-President; George D. Barron, Treasurer; Bradley Stoughton, Secretary.

FLIN-FLON.

During the past few weeks the following story has been published in some of our newspapers. We are unable to obtain any confirmation of it. "It is rumored that the British Mineral Resources Commission may take over the copper deposit at Flin-Flon, and develop it as a national utility. There are 25,000,000 tons of copper sulphides blocked out there, with an estimated value of \$250,000,000. The world needs this wealth of minerals, and it is urged that the government, through the commission, take over and nationalize it for the people. The proposition is thought to be too large for private interests to develop, and it is stated that there is very little likelihood of the present owners going ahead on account of the huge amount of capital required to make a start."

A RAILWAY TO FLIN-FLON NEEDED.

Regarding the recent trip of Mr. J. P. Gordon from The Pas to Flin-Flon, "The Pas Herald" says:

Mr. Gordon declined to discuss his trip in detail, but he thought the road could be built at a light cost, with light grades and curvatures and light bridging. He stated that the distance would probably be near 75 miles, and with sidings and terminals the total steel required would figure around 82 miles. In his opinion this railway would have great scenic value, in addition to the great commercial value for which it is intended to be constructed.

It is known that the owners of the sulphide ore mine at Flin-Flon have stated that "We cannot attempt to treat or develop this ore body without transportation." Mr. John Black, head of the syndicate controlling it, advises that it is definitely determined that 25,000,000 tons of ore lies at Flin-Flon lake, and he adds that this is a very low estimate. It is estimated that the railway from The Pas will cost two million. The Mandy mine, with thousands of tone in reserve, is not included in this estimate, and neither are the numerous small prospects scattered throughout the Athapuskow copper field.

This railway, when built and in operation, will not only serve the Athapuskow copper field, but it will, in addition, be the main highway of Northern commerce, such as fur and fisheries, and the tungsten and iron deposits at Puckatawan.

Mr. Gordon's trip is preliminary to a survey, and it is expected that this will be done while the weather conditions are favorable for getting in supplies and in getting over the ground.

MORE BRITISH MANUFACTURES ON FREE LIST.

The British Trade Commissioners in Canada (Mr. G. T. Milne at Montreal, and Mr. F. W. Field at Toronto), have received cable advices from the Department of Overseas Trade (Development and Intelligence), that a wide range of British manufactures have been placed on the free list, and now require no export license:

Lists of goods for which export licenses are still required for shipment from the United Kingdom will shortly be in the hands of the British Trade Commissioners noted above. They will also be advised weekly, by cable, by their department in London of the goods removed from such list and any alterations thereto. The British Trade Commissioners will be glad to take up these matters with local importers, and others interested.

The following are some of the principal commodities for which licenses are still required: Abrasives, agricultural machinery, cement, chemicals (various), coal and coke, oils, pipes (cast iron), packing cases, railway material, resins, coal tar products, copper (wrought and unwrought, including wire); alloys, dyes, foodstuffs, food for livestock, glue, iron angles, bars, billets and constructional material, steel angles, ingot plates and similar raw materials, textile machinery, textile yarns, fibres and waste, tin plates, war material, wire rope, wood and timber. The prohibition of the exportation of raw materials does not extend to goods manufactured from such materials.

MANAGER BRIGHAM'S REPORT ON HOLLINGER.

Significant statements appear in the general comments of Manager A. F. Brigham on operations at Hollinger mine in 1918. He says:

The tonnage is approximately as shown in last year's statement, as no effort was made to effect any increase in the face of greatly adverse labor conditions and high prices for supplies. We have, however, kept abreast of a materially increased tonnage. All veins have generally maintained their values, and in the case of No. 84 marked improvement has obtained between the 425 and 800-foot levels. Below the 800-foot level work has practically been suspended pending better conditions as noted above.

The ease and efficiency with which the tonnage treated during the year was handled, indicates that we have no cause to anticipate anything but satisfaction from this department.

Anything that has been said or written about the effect of shortage of labor and high prices for material upon working costs during 1917 applies with greater emphasis during 1918 and is reflected in every item of the statements.

The disabilities under which the gold mining industry has been carried on owing to the transitory habits and shortage of miners, obtained its maximum when, in November, the number of men engaged underground reached the low figure of 482 as compared with 849, the highest. We had for competitors the silver, nickel and copper mines, which could advance wages easily, as the price of their product increased. We, on the other hand, soon got to our limit, as the price of gold did not move.

Now, however, with peace assured, all are thankfully and hopefully looking to the future for a return to more normal conditions when the slow process of readjustment is completed.

CLAIMS AT PINEROOT WILL BE DEVELOPED.

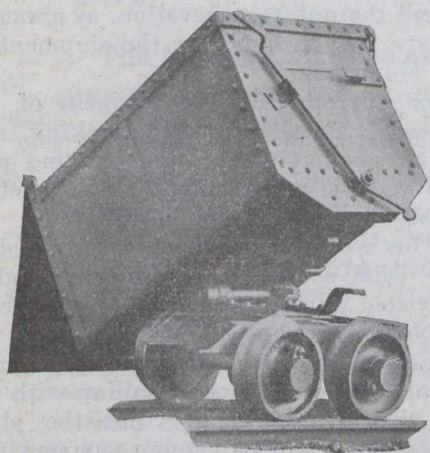
According to "The Pas Herald," six mining claims at the mouth of the Pineroot river, in the Athapuskow copper field, belonging to Messrs. E. L. Master-son, Dr. Robertson, W. J. Young and J. Maxwell, of The Pas, have been optioned to C. W. Greenlees, of Duluth, for \$135,000. A cash payment of \$1,000 was made for the option, and the terms of the sale are that the payments will be made in three instalments extending over a period of three years. Mr. Greenlees agrees to keep five men permanently at work developing until the payments are all made.

These claims were staked in 1914, and considerable stripping has been done. The discovery was made on copper sulphides, and this appears to be the chief ore content. Mr. Greenlees, it is understood, is representing Duluth interests. He is a mining engineer, and has spent some time in The Pas field.

Not far from this group of six claims is located the Chica group, where a diamond drill was operated during the summer of 1918. The Chica is said to be backed by Steel Trust officials. The Pineroot river has come into prominence more recently, owing to the activities of prospectors in that vicinity, and also on account of the report that the Chica will resume diamond drilling in the spring.

ROTARY MINE CARS

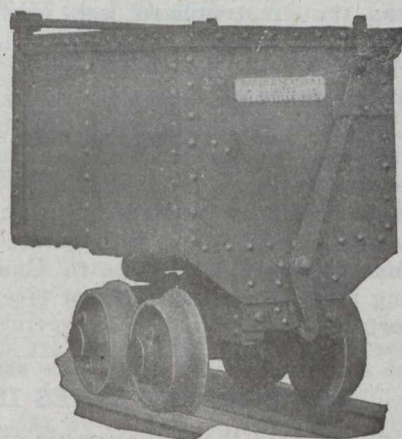
Roller Bearing, or not, as desired



Will dump at either side or either end, and positively will not dump until in the desired position.

Made any size or capacity, and to fit any gauge of track.

We also make any other type of Mine Car you want. Let us Tender on your next order.



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Silver Assay Balance, Troemner 10 in. Beam, Weighs easily to .05 MG. Sensitive to .03 MG. Price \$60.00.

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CUT GEARS

All Types - Any Size
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Adjoining Hattie Gold Mines in Coulson, Beatty Area
Would give Working Option to responsible parties

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Tanks, Air Receivers, Penstocks, Etc.
Dealers in Railway and Power Plant Machinery

BANK OF HAMILTON BDC, TORONTO LIMITED

FOR SALE

- 1 4x8 Marathon Mill, with 7 tons of grinding rods from 5/8 to 1 1/4 in. diameter, and 7 tons extra 1 1/4 in. rods. The delivery of this mill was too late for the purpose for which it was bought, so it has not been used.
- 1 12-in. x 15-in. two-drum Jenckes Tandem Hoist, with one 20-in. auxiliary drum and one nigger-head mounted on the shaft extension. Second-hand, but in good condition.
- 1 Steel Mast, 11 x 17 inches, 45 or 60 feet long, equipped with all sheaves, foot castings and swivel top piece for 12 guy wires.
- 1 1 cu. yard Mansfield back dump Excavator Bucket, second hand.

**McKinley-Darragh-Savage
Mines Limited**

COBALT, :: ONTARIO

C. P. R. ASKS FOR CHARTER FOR LINE TO THE PAS COPPER FIELDS.

In the Canada Gazette of January 18 there appears a notice of the intention of the C. P. R. to apply to this session of Parliament for a charter to construct a railway line to The Pas copper fields.

The application is based on the desirability of tapping the great mineral belt of The Pas, and connecting it by direct line to every large point in the prairie provinces, and particularly to furnish direct transportation from the coal fields of Alberta, and for the economical transportation of western grains to tide-water, via the Hudson Bay Railway.

The preamble of intention indicates that the proposed line will be constructed from Lanigan, on the Pheasant Hills branch, in Saskatchewan, and in a norther-easterly direction to Cumberland House, passing through the rich Carrot river valley and near Melfort.

THE SMELTER RATES INQUIRY.

Having visited the management of the Consolidated Mining & Smelting Co. of Canada at the Trail Smeltery, where a full discussion took place regarding their investigation and its scope, the members of the Committee of Inquiry into the rates charged for treatment of custom ores at Trail, is engaged in making preparations for the securing of evidence from all who are interested. In this connection a circular has been issued and is being distributed among all shippers independent of the company. It reads as follows:

"This committee has begun its work. While it has extensively advertised its wish to receive either oral evidence as to facts or opinions of shippers of ore to Trail concerning their relations to the smelter, it feels that further opportunity should be afforded for hearing from any who have thus far failed to make their position known to the committee.

"For this reason a copy of this letter is being sent to all shippers to ask their wider and continued co-operation towards making our investigation completely successful and satisfactory to all concerned.

"Appreciating the fact that some shippers may naturally not desire to make statements in any public way, we wish to impress on you and them the fact that we are quite prepared to afford every reasonable opportunity for private hearing and discussion and that we will endeavor to make arrangements for this if necessary after hearing from you.

"We wish particularly to have it known that it is not only the matter of rates and charges as such that come within the purview of our work but the collateral matter of sampling, settlement, or anything else which may, and often does, cause dissatisfaction.

"We shall be glad to receive any communication or complaints touching these matters and trust that such will be sent to the secretary not later than the 12th February next."

Mr. Clifford E. C. Smith, who was nominated for election as a councillor of the Canadian Mining Institute, has declined the nomination on the ground that Ottawa should be represented. Mr. Geo. Mackenzie, of Ottawa, was nominated, but his nomination was invalid owing to late delivery of the mail. Mr. Smith favors the renomination of Mr. Mackenzie.

CANADA COPPER CORPORATION.

A large part of the machinery for the concentrating mill to be installed at Allenby, B.C., by the Canada Copper Corporation has reached Princeton, a few miles from its destination, and is awaiting the completion of the branch railway to Allenby. This line now is almost completed. It is understood that no time shall be lost in preparing the mill for operation, as arrangements otherwise are well in hand for the shipment of ore from Copper Mountain.

"The conditions surrounding the business of the Canada Copper corporation generally speaking, and particularly the completion of the underground program at the mine and the progress in the construction of the mill, have been entirely satisfactory, the schedule set for this work having been maintained to date, despite the usual condition affecting all industries which has existed during the period," says President Mayer in a New York report. "It appears to me, and to the engineers directly in charge of the construction work, and therefore most familiar with the conditions, that the estimate made that the plant should commence operations this coming summer, will be realized."

"In view of the fact that ample ore had been developed to supply the mill for many years, the mine was shut down in September, sufficient development work having been done to quickly place the mine in a position to supply tonnage to the mill on its completion. The mine camp at this time is completely closed down.

"The expectancy of developing considerable additional ore remains the same and a substantial area is still to be prospected to confirm the unknown possibilities in this direction."

"WAR TEMISKAMING."

The Temiskaming district will soon be known throughout the British Empire as the district that established a record in Canada as subscribers to the Dominion Victory loan. The means to let the world know of its patriotism will be furnished by the good ship "War Temiskaming." This boat is named in honor of this district, by the Canadian Government, for setting a lead in the recent Victory loan campaign.

The "War Temiskaming" was launched at the Polson Iron Works Company's docks in Toronto on Saturday, Feb. 8, The honor of christening the boat fell to Mrs. R. S. Taylor, wife of the chairman of the Temiskaming district, and the well known hardware merchant.

Among those present were G. H. Wood, Chairman of the Ontario division, Geo. C. Wallace, organizer of Temiskaming, and F. Montye Macrae, organizer of the northern division.

Temiskaming subscriptions to the loan aggregated \$7,000,000, of which \$2,500,000 has been credited to Toronto, owing to the head offices of some of the mining companies being in that city. Temiskaming raised double its objective.

IRON ORE IN 1918.

Statistics and estimates of the United States production of iron ore in 1918, compiled under the direction of Ernest F. Burchard, of the U. S. Geological Survey, Department of the Interior, show a moderate decrease in output compared with the high records of 1916 and 1917.



PROVINCE OF QUEBEC

MINES BRANCH

Department of Colonization, Mines and Fisheries

The chief minerals of the Province of Quebec are Asbestos, Chromite, Copper, Iron, Gold, Molybdenite, Phosphate, Mica, Graphite, Ornamental and Building Stone, Clays, etc.

The Mining Law gives absolute security of Title and is very favourable to the Prospector.

MINERS' CERTIFICATES. First of all, obtain a miner's certificate, from the Department in Quebec or from the nearest agent. The price of this certificate is \$10.00, and it is valid until the first of January following. This certificate gives the right to prospect on public lands and on private lands, on which the mineral rights belong to the Crown.

The holder of the certificate may stake mining claims to the extent of 200 acres.

WORKING CONDITIONS. During the first six months following the staking of the claim, work on it must be performed to the extent of at least twenty-five days of eight hours.

SIX MONTHS AFTER STAKING. At the expiration of six months from the date of the staking, the prospector, to retain his rights, must take out a mining license.

MINING LICENSE. The mining license may cover 40 to 200 acres in unsurveyed territory. The price of this license is Fifty Cents an acre per year, and a fee of \$10.00 on issue. It is valid for one year and is renewable on the same terms, on producing an affidavit that during the year work has been performed to the extent of at least twenty-five days labour on each forty acres.

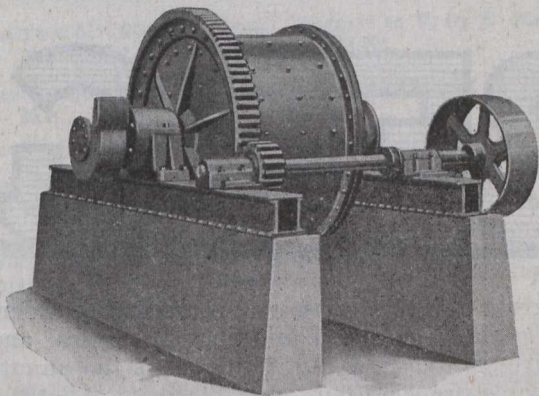
MINING CONCESSION. Notwithstanding the above, a mining concession may be acquired at any time at the rate of \$5 an acre for SUPERIOR METALS, and \$3 an acre for INFERIOR MINERALS

The attention of prospectors is specially called to the territory in the North-Western part of the Province of Quebec, north of the height of land, where important mineralized belts are known to exist.

PROVINCIAL LABORATORY. Special arrangements have been made with POLYTECHNIC SCHOOL of LAVAL UNIVERSITY, 228 ST. DENIS STREET, MONTREAL, for the determination, assays and analysis of minerals at very reduced rates for the benefit of miners and prospectors in the Province of Quebec. The well equipped laboratories of this institution and its trained chemists ensure results of undoubted integrity and reliability.

The Bureau of Mines at Quebec will give all the information desired in connection with the mines and mineral resources of the Province, on application addressed to

HONOURABLE HONORE MERCIER,
MINISTER OF COLONIZATION, MINES AND FISHERIES, QUEBEC.



BALL MILLS, TUBE MILLS,

Ball and Tube Mill Liners,
Hard Iron Balls for Ball Mills,
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Skips, Cages, Cars,
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STEEL CASTINGS--any size

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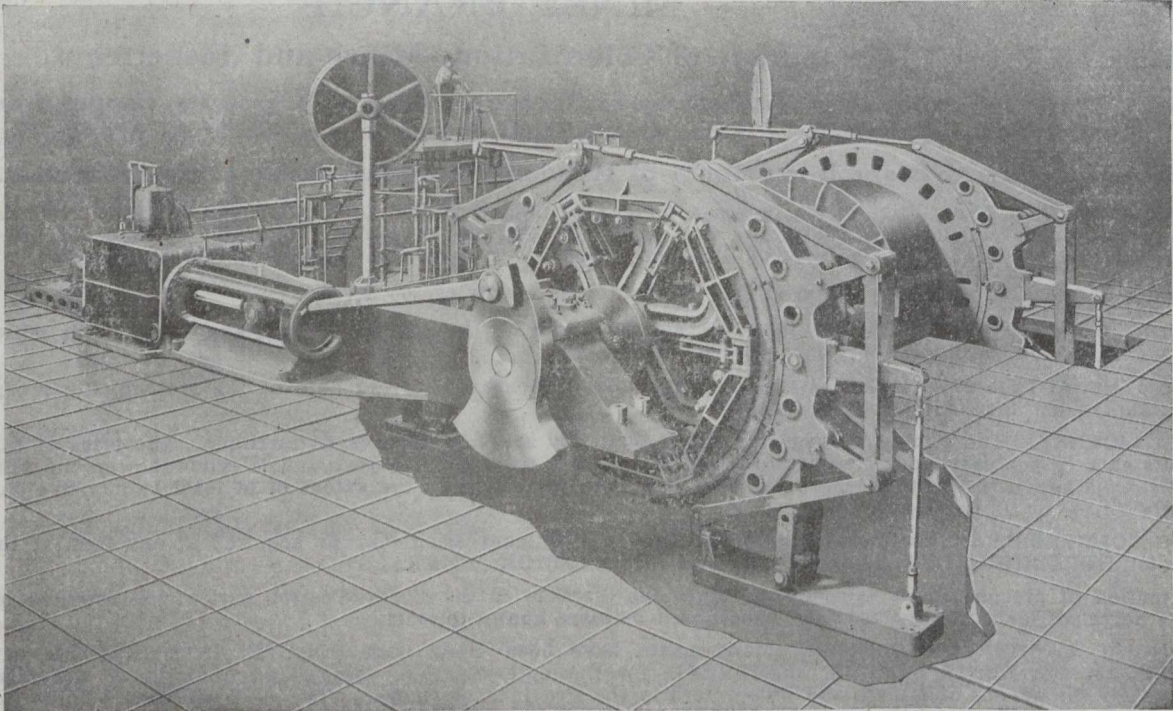
All Kinds of MINING MACHINERY,
CRUSHER JAWS, HAMMERS AND
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CYCLONE BEATERS
BUCKET TIPS, STAMPS AND DIES,
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Mild Steel Castings for all purposes

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Our Special Quality "HYMANG"
BALLS FOR BALL MILLS RE-
DUCE COST OF ORE PER TON
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The Largest Coal Hoist in the world is a

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THIS Hoist, in operation at the Inverness Collieries at Inverness, Nova Scotia, has engines with cylinders 34" and 34" in diameter by 72" stroke. It has two double clutched drums each 10' diameter and designed to wind 10,000 ft. of 1½" rope in six layers. The hoist works with a maximum rope pull of 42,000 lbs., and hoists 12 cars of coal per trip.

The shaft is an inclined shaft starting off at approximately 15° and increasing to 23° at the bottom.

Just as its gigantic size shows that no task is

too great for Nordberg engineers and builders—its perfect operation and ease of control and positive safety show that no detail is too minute to receive proper attention.

This is why mine operators have confidence in Nordberg Hoists. A Nordberg Hoist means greatest economy and ease of operation—dependable performance and absolute safety.

How about the hoists in your mine. Why not write to us today and get the benefit of our experience? Our advice is yours freely and without obligation.



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Manufacturers of High Efficiency Corliss Engines—Uniflow Engines—Poppet Valve Engines—Oil Engines—Nordberg-Carels Diesel Type Engines—Blowing Engines—Hoisting Engines—Pumping Engines—Air Compressors and Other Machinery.



CANADA

DEPARTMENT OF MINES

HON. MARTIN BURRELL, *Minister*

R. G. McCONNELL, *Deputy Minister*

MINES BRANCH

Recent Publications

Iron Ore Occurrences in Canada, Vol. II. Compiled by E. Lindeman, M.E., and L. L. Bolton, M.A., B.Sc. Introductory by A. H. A. Robinson, B.A.Sc.

The Copper Smelting Industry of Canada. Report on, by A. W. G. Wilson, Ph.D.

Building and Ornamental Stones of Canada (British Columbia). Vol. V., by W. A. Parks, Ph.D.

Peat, Lignite and Coal; their value as fuels for the production of gas and power in the by-product, recovery producer. Report on, by B. F. Haanel, B.Sc.

Annual Mineral Production Reports, by J. McLeish, B.A.

The Coal-fields and Coal Industry of Eastern Canada, by F. W. Gray.

Occurrences and Testing of Foundry Moulding Sands. Bulletin No. 21, by L. H. Cole, B.Sc.

Analyses of Canadian Fuels. Parts I to V, by E. Stansfield, M.Sc., and J. H. H. Nicolls, M.Sc.

Clay Resources of Southern Saskatchewan, by N. B. Davis, M.A., B.Sc.

Summary Report of the Mines Branch, 1917.

The Mineral Springs of Canada. Part II., by R. T. Elworthy, B.Sc.

The Mines Branch maintains the following laboratories in which investigations are made with a view to assisting in the development of the general mining industries of Canada:—

Fuel Testing Laboratory.—Testing value of Canadian fuels for steam raising and production of power gas; analyses, and other chemical and physical examinations of solid, liquid and gaseous fuels are also made.

Ore-Dressing Laboratory.—Testing of Canadian ores and minerals, to ascertain most economical methods of treatment.

Chemical Laboratory.—Analysing and assaying of all mineral substances and their manufactured products. Copies of schedules of fees, which are slightly in excess of those charged by private practitioners, may be had on application.

Ceramic Laboratory.—Equipment is such that complete physical tests on clays and shale of the Dominion can be made, to determine their value from an economic standpoint.

Structural Materials Laboratory.—Experimental work on sands, cements and limes is also undertaken.

Applications for reports and particulars relative to having investigations made in the several laboratories should be addressed to The Director, Mines Branch, Department of Mines, Ottawa.

GEOLOGICAL SURVEY

Recent Publications

Summary Report. The annual Summary Report of the Geological Survey is now printed in parts. Applicants should therefore, state what particular geologist's report is required, or what subjects they are interested in.

Memoir 95. Onaping Map-Area, by W. H. Collins.

Memoir 98. Magnesite Deposits of Grenville District, Argen-teuil County, Quebec, by M. E. Wilson.

Memoir 101. Pleistocene and recent deposits in the vicinity of Ottawa, with a description of the soils, by W. A. Johnston.

Memoir 105. Amisk-Athapapuskow Lake district, by E. L. Bruce.

Memoir 106. Road materials in a portion of Vaudreuil county, Quebec, and along the St. Lawrence river from Quebec boundary to Cardinal, Ontario, by R. H. Picher.

Map 63A. Moncton Sheet, Westmoreland and Albert Counties, New Brunswick. Topography.

Map 132A. Southwestern portion of Rainy River district, Ontario. Soils.

Map 135A. Lower Churchill river, Manitoba. Geology.

Map 145A. Timiskaming county, Quebec. Geology.

Map 154A. Southwestern Yukon.

Map 157A. East Sooke, Vancouver Island, British Columbia. Topography.

Map 165A. Windermere, Kooteney district, B.C. Topography.

Map 174A. Blairmore, Alberta. Topography.

Map 179A. Onaping; Sudbury and Timiskaming districts, Ont. Geology.

Map 183A. Harricana-Turgeon basin; Abitibi, Timiskaming and Pontiac, Que. Geology.

Maps 1697 and 1698. Explored routes in a belt traversed by the Canadian Northern Ontario railway,—in two sheets: Sheet 1 Gogama to Missonga, Sudbury district; Sheet 2 Oatland to Penhurst, Algoma district, Ontario.

Map 1690. Whiteburn Gold District, N.S. Geology.

Map 1702. Klotassin, Yukon Territory. Geology.

Map 1710. Bothwell-Thamesville oil region, Kent county, Ontario.

Map 1712. Foothills of Southern Alberta, St. Mary river to Highwood river. Geology.

Map 1714. The Niagara peninsula, Ontario. Geology.

Map 1715. The Ontario peninsula. Geology.

Applicants for publications not listed above should mention the precise area concerning which information is desired.

Maps published within recent years may be had, printed on linen, at the nominal cost of ten cents each.

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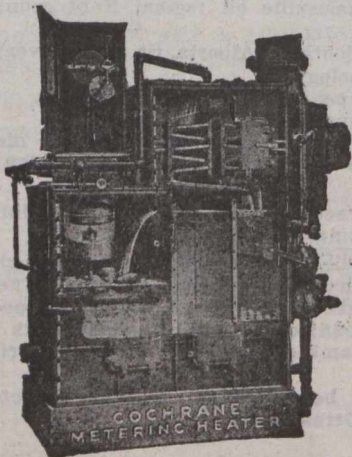
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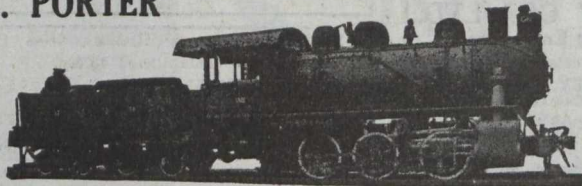
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Canada Metal Co., Ltd. Hoyt Metal Co.

Canadian Miners' Buying Directory.—(Continued from page 29.)

<p>Pipes— Canada Metal Co., Ltd. Consolidated M. & S. Co. Northern Canada Supply Co. Smart-Turner Machine Co.</p> <p>Pipe—Wood Stave— Pacific Coast Pipe Co., Ltd. Mine and Smelter Supply Co.</p> <p>Piston Rock Drills— Mussens, Limited.</p> <p>Pneumatic Tools— Can. Ingersoll-Rand Co., Ltd. Jones & Glassco.</p> <p>Prospecting Mills and Machinery— Standard Diamond Drill Co. Mine & Smelter Supply Co.</p> <p>Pulleys, Shafting and Hangings— Northern Canada Supply Co.</p> <p>Pulverizers—Laboratory— Mine & Smelter Supply Co.</p> <p>Pumps—Boiler Feed— Smart-Turner Machine Co. Northern Canada Supply Co. Can. Ingersoll-Rand Co., Ltd.</p> <p>Pumps—Centrifugal— Mussens, Limited. Smart-Turner Machine Co. M. Beatty & Sons. Can. Ingersoll-Rand Co., Ltd. Mine & Smelter Supply Co.</p> <p>Pumps—Electric— Smart-Turner Machine Co. Can. Ingersoll-Rand Co., Ltd.</p> <p>Pumps—Sand and Slime— Mine & Smelter Supply Co.</p>	<p>Pumps—Pneumatic— Smart-Turner Machine Co. Can. Ingersoll-Rand Co., Ltd. Sullivan Machinery Co.</p> <p>Pumps—Steam— Can. Ingersoll-Rand Co., Ltd. Mussens, Limited. Northern Canada Supply Co. Smart-Turner Machine Co. R. T. Gilman & Co.</p> <p>Pumps—Turbine— Smart-Turner Machine Co. Can. Ingersoll-Rand Co., Ltd.</p> <p>Pumps—Vacuum— Smart-Turner Machine Co.</p> <p>Quarrying Machinery— Sullivan Machinery Co. Can. Ingersoll-Rand Co., Ltd. Hadfields Ltd.</p> <p>Rails— Hadfields Ltd. R. T. Gilman & Co.</p> <p>Roofing— Northern Canada Supply Co.</p> <p>Rope—Manilla and Jute— Jones & Glassco. Northern Canada Supply Co. Allan, Whyte & Co.</p> <p>Rope—Wire— Allan, Whyte & Co. Northern Canada Supply Co.</p> <p>Rolls—Crushing— Hadfields Ltd.</p> <p>Samplers— C. L. Constant Co. Ledoux & Co. Milton Hersey Co. Thos. Heys & Son. Mine & Smelter Supply Co.</p> <p>Screens— Northern Canada Supply Co. Hendrick Mfg. Co. Hadfields Ltd.</p>	<p>Screens—Cross Patent Flanged Lip— Hendrick Mfg. Co.</p> <p>Separators— Smart-Turner Machine Co.</p> <p>Sheet Lead— Canada Metal Co., Ltd.</p> <p>Sheets—Genuine Manganese Bronze— Hendrick Mfg. Co.</p> <p>Shovels—Steam— M. Beatty & Sons. R. T. Gilman & Co.</p> <p>Smoke Stacks— Hendrick Mfg. Co. MacKinnon Steel Co., Ltd. Marsh Engineering Works.</p> <p>Steel Barrels— Smart-Turner Machine Co.</p> <p>Steel Castings— Can. Brakeshoe Co., Ltd. Hadfields Ltd.</p> <p>Steel Drills— Sullivan Machinery Co. Northern Canada Supply Co. Can. Ingersoll-Rand Co., Ltd.</p> <p>Steel Drums— Smart-Turner Machine Co.</p> <p>Steel—Tool— N. S. Steel & Coal Co. Hadfields Ltd.</p> <p>Stone Breakers— Hadfields Ltd.</p> <p>Surveying Instruments— C. L. Berger.</p> <p>Tables—Concentrating— Mine & Smelter Supply Co.</p> <p>Tanks (Wooden)— Gould, Shapley & Muir Co., Ltd. Pacific Coast Pipe Co., Ltd.</p> <p>Tanks—Steel— Marsh Engineering Works. MacKinnon Steel Co.</p>	<p>Tanks—Cyanide, Etc.— Hendrick Mfg. Co. Pacific Coast Pipe Co., Ltd. MacKinnon Steel Co.</p> <p>Tanks (water) and Steel Towers— Gould, Shapley & Muir Co., Ltd. MacKinnon Steel Co.</p> <p>Tramway Points and Crossings— Hadfields Ltd.</p> <p>Transits— C. L. Berger & Sons.</p> <p>Transformers— R. T. Gilman & Co.</p> <p>Tubs— Hadfields Ltd.</p> <p>Welding Rod and Flux— Imperial Brass Mfg. Co.</p> <p>Welding and Cutting, Oxy-Acetylene— Imperial Brass Mfg. Co.</p> <p>Wheels and Axles— Hadfields Ltd.</p> <p>Winding Engines—Steam and Electric— Can. Ingersoll-Rand Co., Ltd. Marsh Engineering Works.</p> <p>Wire Cloth— Northern Canada Supply Co. B. Greening Wire Co., Ltd.</p> <p>Wire (Bare and Insulated)— Standard Underground Cable Co., of Canada, Ltd.</p> <p>Zinc Spelter— Canada Metal Co., Ltd. Hoyt Metal Co.</p>
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Ontario, with its 407,262 square miles of area contains many millions of acres in which the geological formations are favorable for the occurrence of minerals, 70 per cent. of the rocks being of pre-Cambrian age. The phenomenally rich silver mines of Cobalt occur in these rocks; so also do the far-famed nickel-copper deposits of Sudbury, the gold of Porcupine and Kirkland Lake, and the iron ore of Helen, Magpie and Moose Mountain mines.

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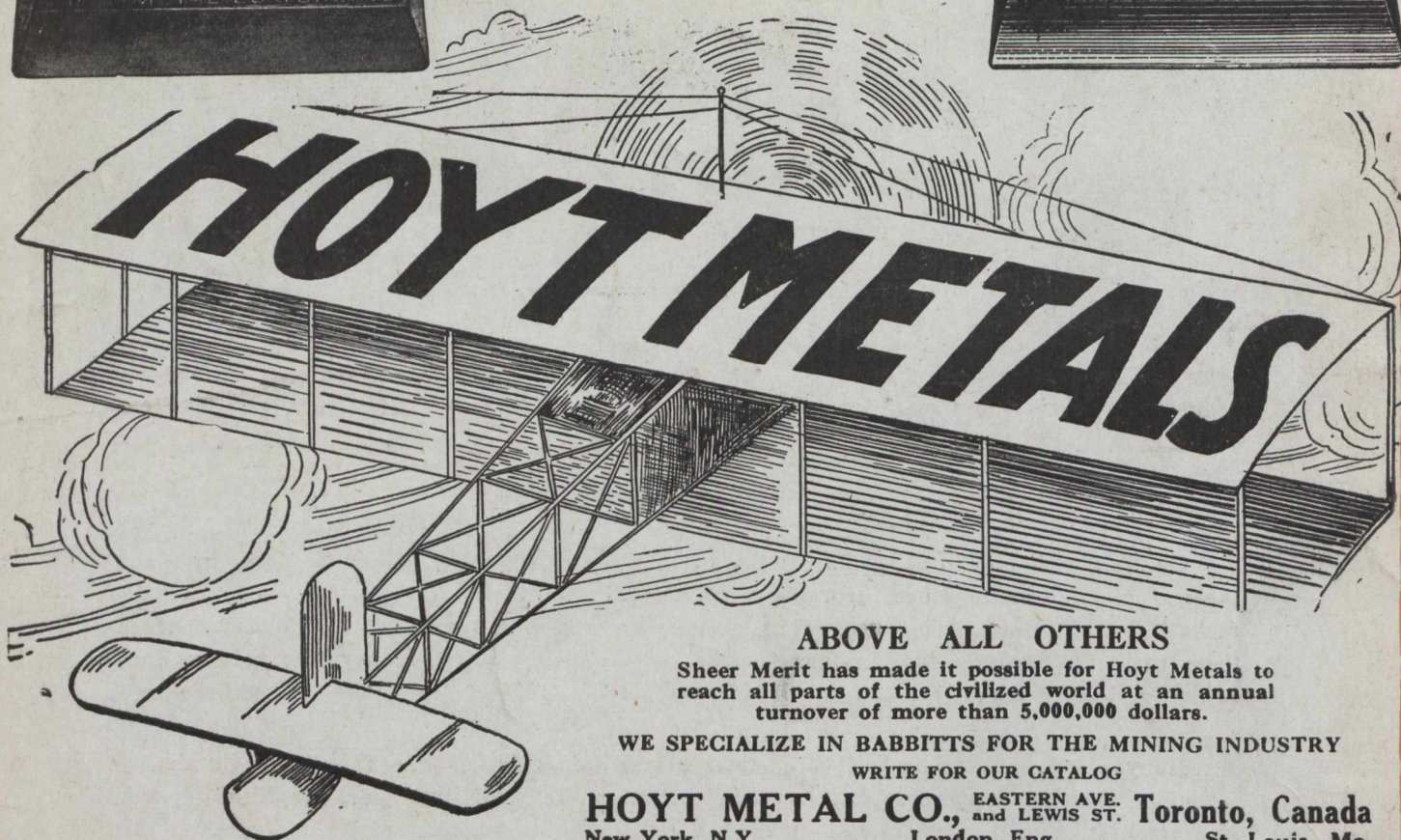
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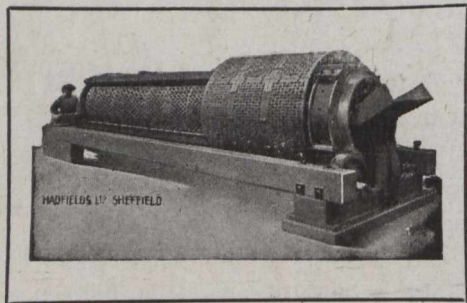
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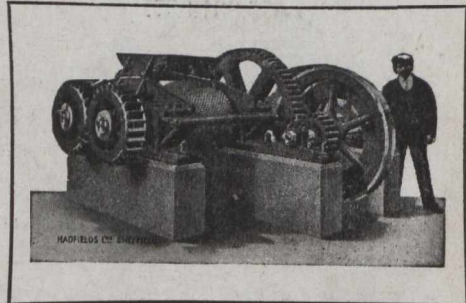
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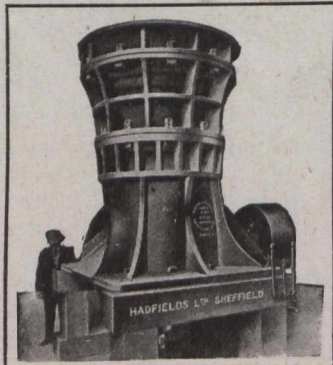
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