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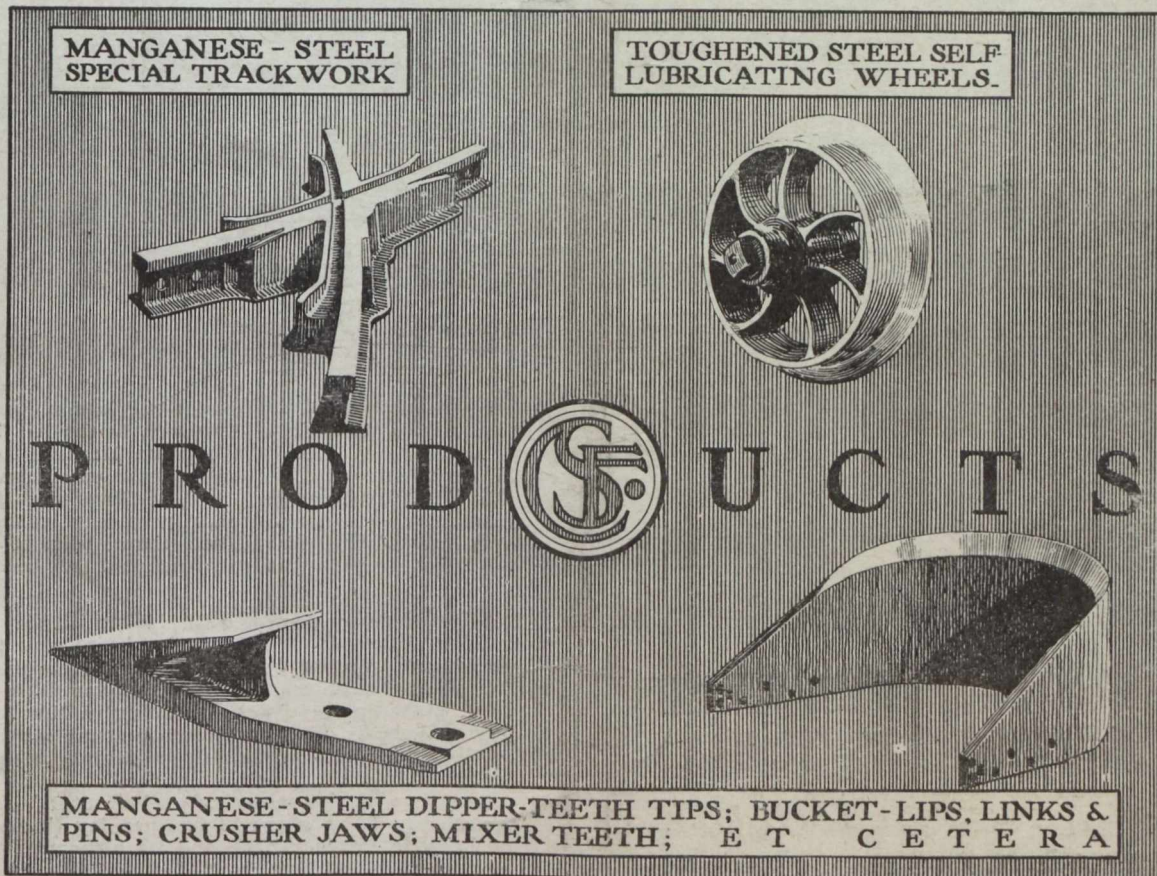
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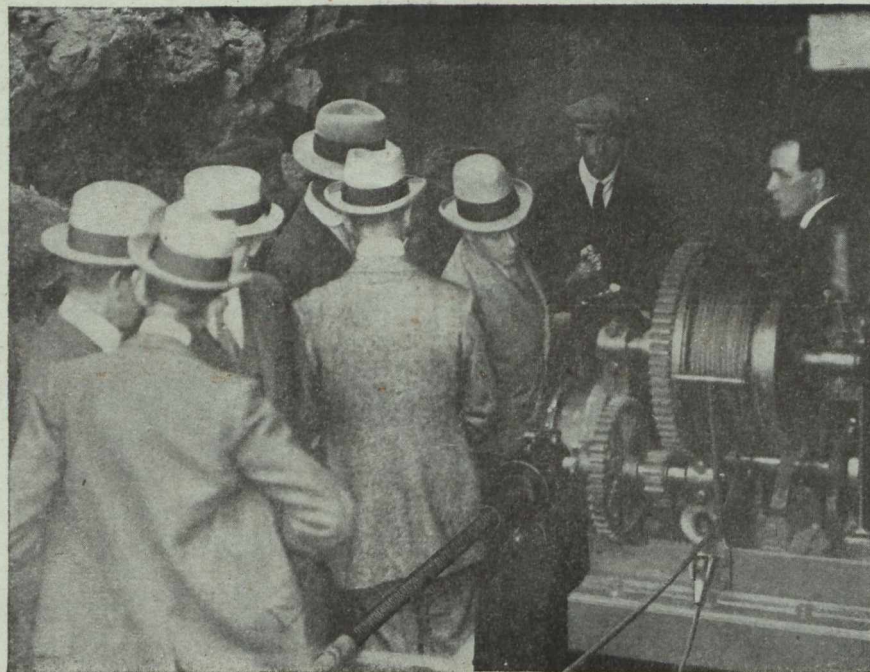


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Diamond Drilling in Cornwall



The Prince of Wales visits his Sullivan Diamond Drill

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THE accompanying photograph was taken on the occasion of a visit of the Prince of Wales, who is also the Duke of Cornwall, to the Kit Hill Mine in June, 1919. The Western Morning News of June 11th says, "Because of the enterprise of the Duchy management in installing up-to-date machinery, these mines are providing valuable quantities of tin and wolfram, the supplies of the latter having proved of great national service during the war.

"The Prince showed a decided aptitude for making the most of his time, for he at once proceeded to view what is probably the most interesting feature of the mines, the new Sullivan Diamond Drill, which began its work of boring on May 28th. This drill bores out a core of rock about one inch in diameter, from which can be learnt the properties of the lode, the object of the drill being for prospecting. It has already bored about 120 feet, the average being about 12 feet per day (horizontal holes in single shifts), and its ultimate depth will be over 700 feet. * * * The Prince spent some time watching the drill at work and displayed a very keen interest, asking many questions relative to the working of the drill. Specimens of metal which had been extracted by the drill were also shown him."

The Prince is the man close to the swivel head, watching the machine work.

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Ontario's Mining Lands

Ontario, with its 407,262 square miles, contains many millions of acres in which the geological formations are favorable for the occurrence of minerals, 70 per cent of the area being underlain by rocks 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 Poreupine and Kirkland Lake, and the iron ore of Magpie and Moose Mountain Mines.

Practically all economic minerals (with the exception of coal and tin) are found in Ontario:—actinolite, apatite, arsenic, asbestos, cobalt, corundum, feldspar, fluorspar, graphite, gypsum, iron pyrites, mica, molybdenite, natural gas, palladium, petroleum, platinum, quartz, salt and tale. This Province has the largest deposits on the continent of talc, feldspar, mica and graphite.

Building materials, such as ornamental marble, limestone sandstone, granite, trap, sand and gravel, meet every demand. Lime, Portland cement, brick and tile are manufactured within the Province.

Ontario in 1918 produced 45 per cent. of the total mineral output of Canada. Returns made to the Ontario Bureau of Mines show the output of the mines and metallurgical works of the Province for the year 1918 to be worth \$80,308,972 of which the metallic production was \$66,178,059.

Dividends and bonuses paid to the end of 1918 amounted to \$13,359,210 for gold mining companies, and \$74,810,521 for silver mining companies, or a total of \$88,169,733.

The prospector can go almost anywhere in the mineral regions in his canoe; the climate is invigorating and healthy, and there is plenty of wood and good water. Hydro-electric power is available in many parts of the Province, and many undeveloped water-powers remain to be harnessed. A miner's license costs \$5.00 per annum, and entitles the holder to stake out in any or every mining division three claims of 40 acres each. After performing 240 day's assessment work on a claim, patent may be obtained from the Crown on payment of \$2.50 or \$3.00 per acre, depending on location in surveyed or unsurveyed territory.

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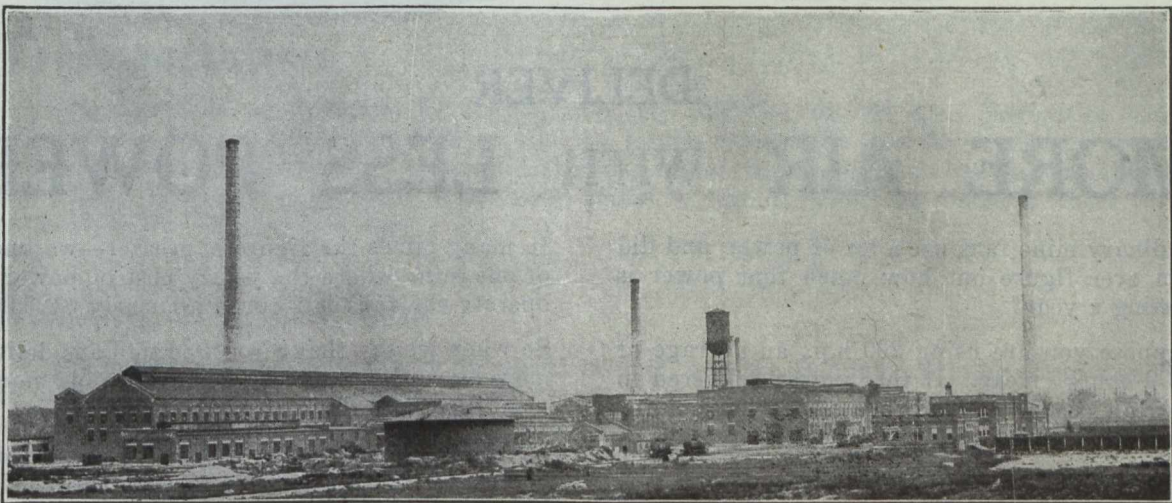
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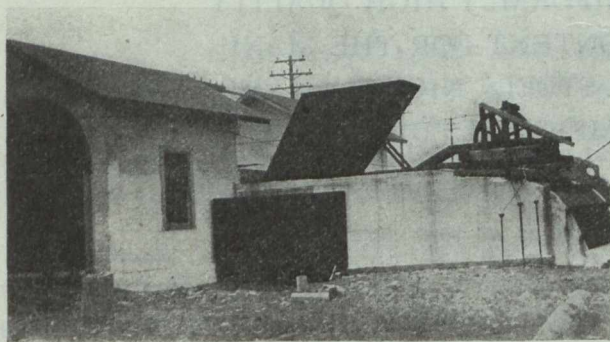
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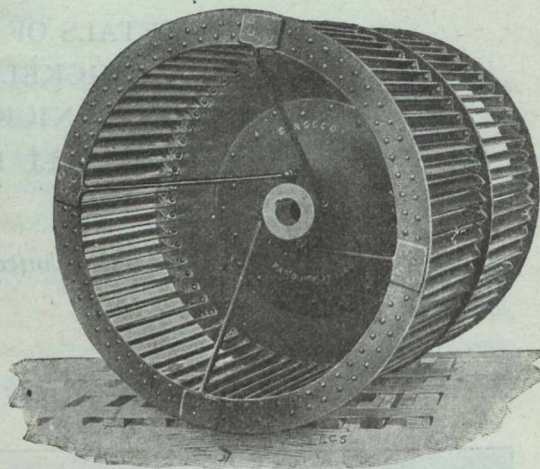
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MINING OPPORTUNITIES IN NORTHERN MANITOBA

Mineral Areas

Approximately three-fifths of the total area of Manitoba is Pre-Cambrian, and all but a small part lies in Northern Manitoba. In the Pre-Cambrian in Ontario, the well-known camps of Sudbury, Cobalt and Porcupine have been developed. In Northern Manitoba there was practically no prospecting until the Hudson Bay Railway gave access to the mineral districts. There are three fields in particular to which attention is now directed—The Pas Mineral Belt, the Cross and Pipestone Lakes area, and the Oxford Lake, Knee Lake, God's Lake and Island Lake area.

Development

Since 1915, development has been rapid in The Pas Mineral Belt. Twenty million tons of low-grade copper ore have been explored by diamond drilling at Flin-Flon Lake. High-grade copper is exported from Schist Lake to the smelter at Trail, B.C.; three and three-quarter million pounds of copper have already been realized. Copper prospects are under development on Athapapuskow Lake, Copper Lake and Brunne Lake. The building of a smelter will give impetus to the development of a large copper industry. Gold is now produced at Wekusko Lake, and important discoveries have been made on Copper Lake, and on Knee Lake on the Hayes River route.

Transportation

Transportation is available by the Hudson Bay Railway, by the Ross Navigation Co. Steamboats on the Saskatchewan River, and by wagon roads built into the producing areas by the Manitoba Government. Wekusko Lake may be reached in less than one day from The Pas. The Hudson Bay Railway gives easy access to several promising districts where little prospecting has yet been done.

Mining Regulations

The mineral resources are under Federal control, and the Dominion Mining Laws apply to Northern Manitoba. No mining license is required. Work to the value of \$100 per year must be performed for a period of five years on claims filed under the quartz mining regulations. The office of the Mining Recorder for Northern Manitoba is at The Pas.

Opportunities for Capital

The district is comparatively new, and there are several very promising properties which may be acquired at reasonable prices. Financial and mining companies would be well advised to have their engineers inspect these properties at an early date.

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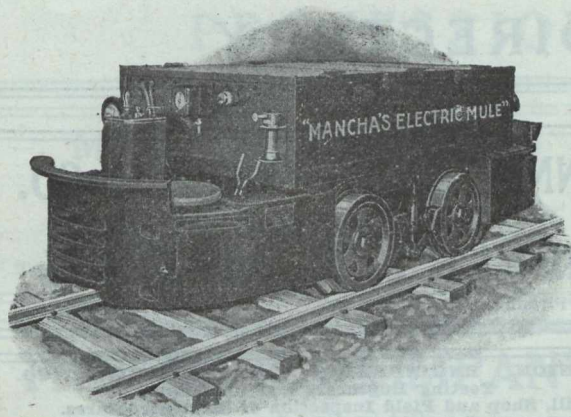
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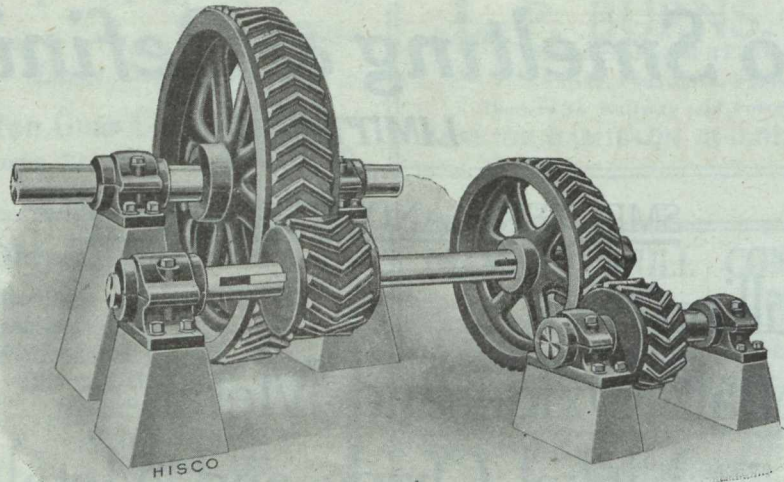
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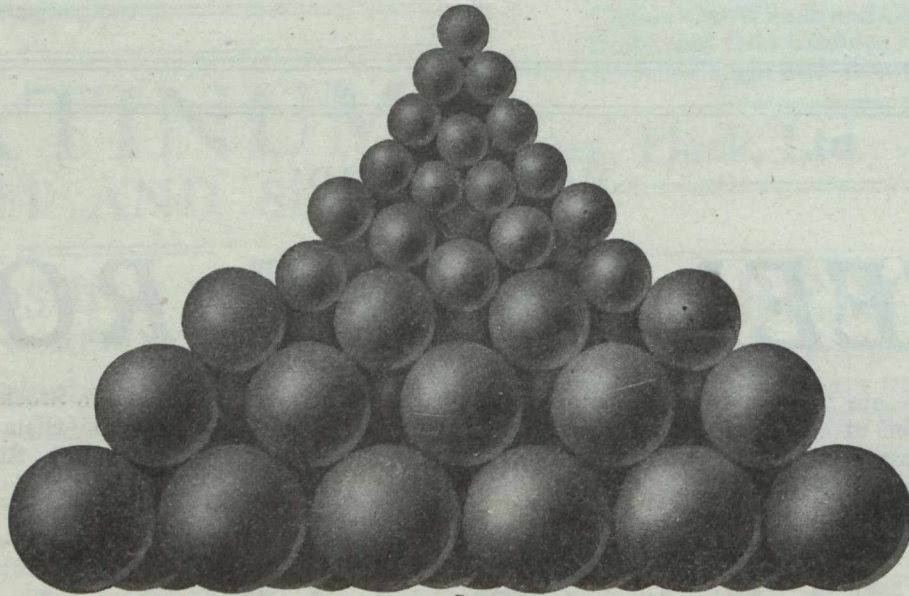
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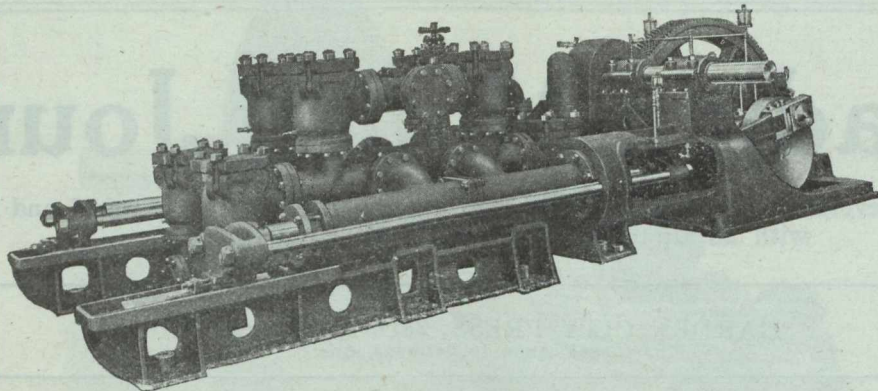
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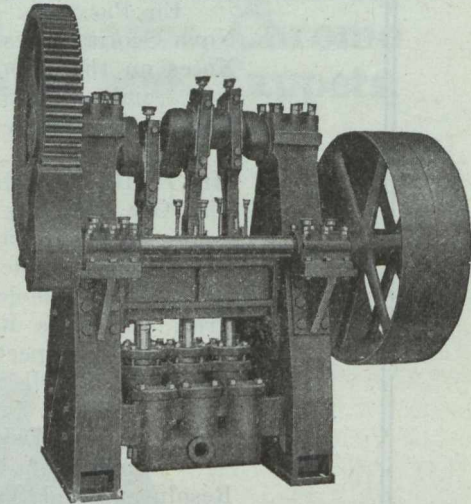
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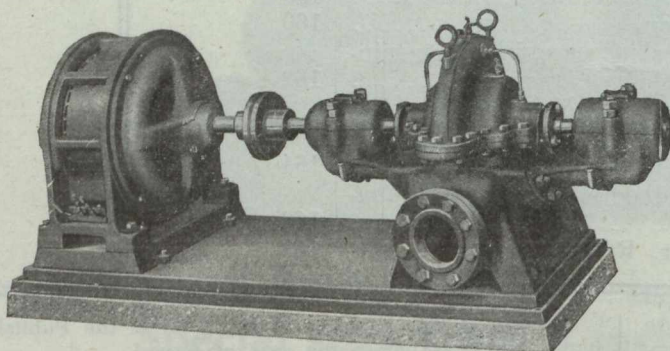
FIG. 1628. For general water supply, Municipal Waterworks, Mine Pumping, etc., where the total net head does not exceed 1305 feet. Made in six sizes, with capacities ranging from 9,360 gallons to 27,500 gallons per hour and for 140 to 565 pounds Working Pressure.

The Frame consists of two standards carrying the main bearings. Crank shaft is steel, accurately machined and the bearings are phosphor bronze. The gearing, Cylinders and valve boxes are charcoal iron. Cross-heads are fitted with adjustable bronze shoes which run in bored Guides. Connecting Rods are cast steel and the plungers cast iron, accurately machined.

Complete data and description in Bulletin 103. Copy on request.



Goulds Single-Acting Triplex Pump



Goulds Fig. 3030. Single Stage, Double Suction Centrifugal Pump, direct connected to an open type motor

FIG. 3030. For general water supply, hot water circulating in heating systems for irrigating, drainages, booster and mine service, and many similar services, where the total net head does not exceed 150 feet, the Goulds Single Stage, Double Suction Centrifugal Pump excels on account of the high efficiency obtained. 80 to 8000 gallons per minute, based on cold, clear water 150 feet head or 65 pounds pressure.

Complete data and description in Bulletin 110. Copy on request.

GOULDS PUMPS FOR EVERY SERVICE

COMPLETE SET OF BULLETINS ON REQUEST

THE CANADIAN FAIRBANKS-MORSE CO. Limited

St. John, Quebec, Montreal, Ottawa, Toronto, Hamilton, Windsor, Winnipeg,
Saskatoon, Calgary, Vancouver, Victoria.

EDITORIAL

The Availability of Labour in Canada

We call our readers' attention to the note on the labour situation in Canada which appears in this issue. It is specially contributed by one who is in the closest touch with the questions surrounding the availability of workmen for the mineral and associated metallurgical industries of Canada. It will be found to confirm the forecast which appeared in the "Journal" in October 1918* of an impending shortage of unskilled labour, and indicates that before very long the Government will have to consider not only the relaxation of the present stringent immigration regulations, intended to act as a deterrent to the incoming of this class of workmen, but will require to resume the former policy of attracting emigration to Canada. Our correspondent points out that the diminished value of European currency in Canada, and the greatly increased expense of railway and steamship transportation are in themselves factors that will tend to restrict emigration from Continental Europe in a very marked measure.

The shortage of unskilled labour is already acting as a brake on production in the East. In the West conditions are easier, but the coal mines and steel works of Nova Scotia, the lumbering, metallurgical and mining industries of Quebec and Ontario, are all suffering from a shortage of men who are willing to work with their hands, and an over-supply of men who are not so willing. It is certain that the type of emigrant now coming into Canada will not undertake the kind of employment that the Italian, Hungarian, Galician, Pole, Russian, Bukovinian and Finnish labourers did before the war.

One partial solution of the difficulty is the substitution of mechanical devices for hand labour, and much progress has already been made in this direction. At one large mine, situated in a locality where labour was formerly plentiful, not less than ninety-five per cent of the ore handled underground is loaded by mechanical shovels. A recent article in this Journal, and a much more detailed article in a recent issue of the "Engineering and Mining Journal" show that mechanical loading devices are now available in much variety and suited to many differing underground conditions. Shovels can be obtained for use in open-face work and in high seams, or they can be obtained for use in the confined conditions of heading and development work. In practice they are found to increase production and materially decrease costs of production, and although the capital expenditure required is not light, the choice of the operator will shortly lie between introducing mechanical methods of handling the product of the mine, or cessation of production. The mining company handling large quantities of ore, stone or coal, that does not include among its appropriations some expenditure on the adaptation of mechanical handling devices for underground use is neglecting an obvious precaution, in the light of the forecast made by our contributor.

* Vide "Canadian Mining Journal," No. 22, 1918. Possibilities of European Immigration after the War" by F. W. Gray.

Mining "Investments"

One of the features of newspaperdom today is the extent of unrestrained advertising of gold and silver mine promotions. "Age cannot wither, nor custom stale their infinite variety" and the apparent freshness of their appeal is contemporary confirmation of the everlasting renewal of the confiding ones. We recently heard of a gentleman—a prosperous plumber—who testified to his contempt for the uninteresting character of Victory Bonds as an investment. "Give me," he said, "something sporting, something on which I shall either made a lot or nothing." Just how much

of the lure of mine promotion advertising lies in this frame of mind, and just how much is pure flat-catching would be difficult to estimate, but judging by the full-page advertisements that are run in our most reputable newspapers, the audience of the mine promoter must be large and avid.

In the Montreal Star there appears an advertisement of the Little Gem Mining Company, and truth to say, the literature of this promotion is a gem. "If," says the tempter, "if you think our proposition is too good to be true, why not then be a sport if you think it is

a gamble, and buy 1,000 shares or even 100 shares? You will find it is one of the squarest games you ever played, and the pot you win will be the largest you ever dreamed of, "ALL DEPENDING ON THE AMOUNT YOU ANTIE UP." Our surmise would be that the author of this diamond of appeal knows more of poker than his spelling of the word "ante" would indicate.

This Journal knows nothing of the little Gem Mining Company, except that it is stated to be in Alaska, but we believe there is no real necessity for Canadian investors to gamble on a pot in Alaska, seeing that so many are sitting in at the feast of Canadian mine promotion at this date. The most glittering ornament among the coruscation of promises in the advertisement is the statement "Dividends sure unless 'an earthquake destroys the mine, or the boat with the 'machinery is sunk en route.'"

The mining engineer on whose report the glowing nature of the prospectus is based is R. David Reese, M.E., to whose character testimony is borne by Mr. G. Goldstein of Goldstein's Emporium, Juneau, Alaska. If there is anything in a name Mr. Goldstein should be well qualified to pass upon a gold mine.

Now we know nothing of Alaska, Mr. Reese, or the Little Gem property, but, if Canadian investors feel in serious need of a little poker game there are quite a number of domestic ventures that are daily recommended through our newspapers, sandwiched in between advertisements of Victory Bonds and provincial long-term notes, and cunningly alluded to in the letterpress of the financial page, beflowered with a verbiage that is redolent of diabasic flows, batholiths, circulating solutions and differentiated magmas that sound like something but mean really nothing.

EN PASSANT.

We recently noticed in a Toronto newspaper some artless references to a gentleman named John Jones who it is said is noted from Cobalt to Alaska as a prospector. He is making a trip into the "North Country"—a delightfully vague terminology, — to locate a "huge tract of coal-bearing country, of which word was brought back by a traveller a quarter of a century ago." In this legendary region it is ingenuously remarked: "There is some coal, lignite. How much. 'Jones is going to find out. Lignite is a soft coal, 'but Jones is strongly of the opinion that the coal 'will get harder the deeper it is mined. The geological 'formation is very similar to that of the Pennsylvania 'mines, where the surface of the coal is lignite, grad-'ually improving and getting harder as it is mined."

We had not heard of this remarkable natural phenomenon of Pennsylvania. Perhaps if they dig a little lower there may be diamonds. It is an interesting hypothesis. Mr. Jones's remarks, as inter-

preted by the reporter sound rather like the prospectus of a gold mine, of which Mr. Jones should not be ignorant, because it is further stated that "Jones knows the history of the North from A to Z, not only its commercial aspect as set forth by company prospectuses, but the very human history of the mining and timber lands, where law is often an unaccepted theory and men become plutocrats by the simple expedients of stealing their neighbor's timber or flooding them out of their mines." Oh, Mr. Jones!

But Mr. Jones had still more wonders to unfold to his trusting auditor. He informed the reporter that Northern Canada is a neglected El Dorado, and that he could talk on the subject for a day and a half and touch but the fringe. We can believe it. Nevertheless it is recorded that "Mr. Jones outlined it in a few words, and then—took the reporter into the yard and showed him his dogs." Mr. Jones should write mine promotion literature. He is wasted driving a dog team. Or perhaps, it is the reporter that has mistaken his vocation?

NOVA SCOTIA NOTES.

Malagash Salt.

The "Journal" is informed that very satisfactory progress is being made with the development of the salt deposit at Malagash, owned and operated by Messrs. Chambers of New Glasgow. About ten tons daily are being produced, and users of the salt are pleased with its quality. The property is of course capable of much larger development, but up to the present, the expenses of equipment and development have been met out of the proceeds of production and no large capital expenditure has been made. In view of the promising nature of the deposit, and its great economic importance to the fisheries which are so large a source of revenue to Nova Scotia, it may be anticipated that before long the property will be developed on a much larger scale.

Coal Production.

Coal production is proceeding at a brisker pace, particularly at the mainland collieries. In the Pietou Field the coal required to fill the sales programme of the Nova Scotia Steel and Coal Company is not only taking all the production of the Acadia Coal Company, but arrangements have been made by which the production of some of the smaller operators in this field is being taken by the Scotia Company.

The coal mines of the Scotia Company at Sydney Mines are working to full capacity, the production being at the rate of from 50,000 to 55,000 tons monthly, or approaching pre-war figures.

The mines of the Dominion Coal Company are working steadily, but the rate of production remains very much below previous figures. This company is more affected by the shortage of suitable labour than any other operator in Nova Scotia nor under present immigration regulations and the cost of railway and steamship transportation does there seem any immediate likelihood of additional suitable labor being secured.

Notes on the Labor Situation in Canada

(Specially Contributed.)

Previous to the war Canada got its common labor supply largely through immigration from Continental Europe.

During the period of the construction of the Grand Trunk Pacific and Canadian Northern railroads thousands of Italian, Austrian, Hungarian and Russian laborers came into the country.

When the war broke out in 1914 practically all the Italian and Russian laborers of military age either went back to Europe to join the army or joined the Canadian forces.

The subjects of the Central Powers were of course not allowed to leave Canada and during the winter of 1914-15 when industrial conditions were very bad and these men could not get work some thousands of them were gathered up by the Dominion Government Authorities and placed in internment camps in various parts of Canada.

During 1915 and 1916 when conditions had improved and when industrial plants and mines were working to capacity some hundreds of these laborers were released on parole from the internment camps for work in different parts of the country to make up to some extent for the shortage of common labor then existing. These men were all paid the regular wages that pertained to the industry in which they went to work.

At the conclusion of the war and as soon as traveling facilities could be obtained thousands of these laborers left Canada to return to their homes and at the present time other thousands are waiting to go as soon as passports and transportation are available, so that it looks at present as if there would be a serious shortage of common labor in the country when construction work starts up in about three months time—as it is very doubtful if the countries to which these laborers belong will sanction their leaving home for some time at least. It might be here mentioned that all or nearly all these men made big wages and took away with them hundreds of thousands of dollars in the aggregate.

Even if the men wanted to return to Canada and their governments were willing to give them permission to come the cost of travelling has advanced to such an extent that it is practically prohibitive. For instance a ticket from Europe to Canada that in pre-war days could be purchased for \$30.00 now costs \$75.00 and the recent enactment of the Dominion Department of Immigration whereby laborers and mechanics coming into Canada must be in possession of \$250.00 adds to the difficulty particularly as the value of Continental money is now less than half of what it was in pre-war days.

One thing regarding new immigrants coming to Canada is practically certain and that is that men who have spent five years in the armies of Europe no matter how anxious they might be to get away from there cannot gather up sufficient money to travel under the above conditions.

The situation therefore that confronts the employer of common labor today is something as follows:—Some thousands of laborers have gone to their homes in

Europe, other thousands are anxiously waiting to go and when railroad construction and other public works start up in April and May there is no available common labor.

There is no immigration into the country at present but some relaxation of the Government Regulations will no doubt be made.

It is well known that railroad construction and as a matter of fact all construction work pays higher wages to laborers than do the industrial plants—the reason for this being that construction is only temporary work whereas industrial plant work is looked upon as permanent nevertheless the question of permanency does not enter largely into the calculations of a man looking for a job. He goes where the wages are highest and consequently the construction job gets the pick of the men while the industrial operator takes what is left.

A perusal of the Trade Journals shows that the United States steel plants and coal mines at present are working to the limit of their labor supply and they are unable to take any more business, as their unfilled tonnage orders are growing larger each month, and it is reasonable to assume that this state of affairs will also apply to Canadian plants. It is hard to see how production can be increased if there is a shortage of labor to produce.

SHORT COURSE FOR THE PAS PROSPECTORS. Will Begin With Meeting of Manitoba Branch of Canadian Mining Institute.

Arrangements have been made for a short course for prospectors and others interested in mining development in The Pas field, during the fortnight following the Dog Derby, on March 17. The course will begin with an open meeting of the Manitoba branch of the Canadian Mining Institute, on Friday evening, March 19th, in the Community Building. It is intended that the course take the form of short talks, followed by discussions on the following:

The characteristics of copper ore.

Field relationships of copper deposits in Northern Manitoba.

Copper smelting and refining.

The copper market.

Zinc-copper ores and their treatment.

Gold and associated minerals in Northern Manitoba.

The field relationships of gold deposits in this district.

The treatment of gold ores.

What assistance should the gold mining industry obtain?

Some unprospected fields in Northern Manitoba.

Blowpipe and other methods of ready determination of ores and other minerals.

The marketing of prospects.

A representative collection of specimens from all known properties in Northern Manitoba has been assembled for reference, and a general collection of ores will be provided for practical study. Lantern slides will be used for purposes of illustration. It is hoped that all who intend to be in town for the Derby will, if interested, co-operate in this course.

Engineers and the Mining Industry

By R. E. HORE.

Man has become dependent on the products of mines for his existence. There may be places where people can live comfortably, like Adam in the Garden of Eden, without utilizing or knowing anything about metaliferous minerals or of coal or oil; but without the products of the mines most of us would be far from contented, even if we had many other things that Adam had to live without. It may therefore be said to be the function of the people engaged in mining, to supply us with certain materials necessary for our existence. Those who do no mining must provide the miner with other necessities, if they wish to get a share of the products of mines. It is up to those who operate mines to see that the exchange is on a fair basis. They must give close attention to the selling of their product as well as to the work of mining and treating the ores, so that those who supply the necessary money and those who do the necessary manual labor will all be well paid.

Those who undertake mining ventures are doing something for the public good; but they are not doing it for philanthropic purposes. Their purpose in producing metals or fuel is to obtain a surplus of something that can be exchanged for some other things they want. Money being the medium for the exchange, the primary purpose of mining ventures is to make money.

Those who devote their lives to the application of science to mining are commonly called mining engineers. It is a function of the mining engineer to use materials, energy and money to the best advantage in the working of ore deposits. This function of the mining engineer is comparable with that of the civil mechanical or electrical engineer and brings him into close touch with men of those professions. Some of these men are connected with industries in much the same way as the mining engineer and have constantly to keep in mind whether proposed work will be profitable or not. Many engineers however, are engaged in work, such as that of public highways, railroads, power development etc., in capacities which place on them no responsibility as to whether it will pay profits or not. There are some mining engineers working in a similar capacity for large companies, but the mining engineers in more responsible positions have constantly to keep in mind that the purpose of their work is to make a profit for those who finance the venture. He has also the task of finding more ore as the work proceeds.

While in the operation of a mine the mining engineer has to assume duties not incumbent on many of his professional relatives, he has still more diversified duties in the early stages of development of a property. When work is begun, there is little known concerning the amount and value of ore in any deposit, yet the engineer must decide on the possibility of mining it at a profit. He has also to decide whether the possible profits warrant payment of large sums to the owners for the property. If he wishes to operate the mine himself he has then to demonstrate some financial ability in finding the necessary money. Comparatively few mining engineers have the necessary money to bring a prospect to the producing stage; but many have undertaken the task of raising money as well as spending it. The mining engineer is thus

called upon in some cases to do many things that are not commonly called engineering.

The impossibility of determining beforehand the extent and value of an ore deposit makes the development of mineral property a hazardous enterprise. The engineer who advises development work cannot demonstrate the value of the property until the job is finished and the ore is all mined out and sold and the plant is scrapped. He can however, examine the property carefully and obtain more useful information on which to base an opinion than can the average person. His report on a prospect is an opinion based on the facts obtainable and its value lies in the fact that the trained, experienced observer sees more and is more likely to interpret facts correctly than is the inexperienced. Any engineer's report on a prospect is however, best regarded as but an expression of opinion. Those who provide money therefore for the development of prospects must properly consider that they are venturing into the unknown, and that they may lose all the money spent in development work. The justification that the engineer has in recommending such speculation lies in the possible large profits that may accrue. If the many mineral discoveries made each year a very small number prove to be of any consequence and few of these prove worthy of development. Engineers knowing the facts are not inclined to be overly optimistic about any prospect.

Favorable reports are not numerous. Mining engineers are sometimes charged with being unduly pessimistic, but in most cases it is the ore deposits rather than the examining engineer, that is the cause of disappointment. A lot of time and money is spent in the search for ore deposits. It is a function of the mining engineer to see that the prospective expenditures are warranted and to advise his clients of his opinion. His experience and training can reasonably be expected to assist him in forming an opinion, that is more valuable than that of most men. In all cases however, it should be understood that the engineer in recommending development of a prospect is advising speculation rather than investment. He can give no definite assurance of success; but he can indicate to those who are willing to take big risks, possibilities of making large profits. Having a special knowledge of ore deposits and the methods and costs of working them, the mining engineer can properly advise speculative enterprise. All producing mines were in the prospect stage at one time in their history and they would still be prospects if no great risk had been assumed by those who developed them.

Many engineers must devote their attention chiefly to the economical working of ore deposits that are already partially developed; but others must undertake the more hazardous task of developing prospects and in some cases the financing of the enterprise. Since financing must be undertaken at a time when the value of a mining property is unknown the mining engineer who undertakes to find the money for development work is faced with a problem in finance quite as important as his technical problems. He must also have executive ability for the carrying out of the work which his technical training and experience and his knowledge of the property suggest.

The mining engineer has also work of quite another character. Mines are commonly the pioneer industry in otherwise undeveloped places. The men in charge of operations become naturally leaders in the mining community and they naturally take greater interest in the welfare of their employees than is to be expected in the case of industries in large cities.

While the services of the mining engineer are needed in the development of properties and in the determination of methods of mining and of the necessary machinery, tools supplies and labor when mining is begun, they are also needed at all times during the life of the mines. The engineer who constructs a concrete highway or builds a bridge can turn it over for public use and feel satisfied that he has finished the job. The equipment and development of a mine is a very different matter. Every day's work in the mine brings new engineering problems and it thus becomes desirable that the operation of a mine should be in charge of an engineer until the ore is all extracted. The most suitable equipment and methods cannot commonly be definitely determined very far in advance of development. Changes to meet new conditions are constantly necessary. The appointment of mining engineers to the positions of mine managers is a natural consequence of this necessity for the continuous service of engineers.

PROF. GWILLIM REPORTS ON BRITISH COLUMBIA OIL PROSPECTS.

The report of Professor Gwillim on the oil possibilities of the Peace River District of British Columbia was brought down in the Legislature at Victoria by Hon. T. D. Pattullo, Minister of Lands, who stated that Prof. Gwillim was appointed in May last to make a geological reconnaissance of areas in the Peace River country where strata formations were believed to correspond with those being investigated in Alberta, where extensive exploratory work was being carried on.

A comparison is made between the oil-bearing formations in Southern Alberta and similar formations found in the Peace River district, the latter of which are declared to be on a larger scale. It is pointed out that the strata are traced from the up-thrust and crumpling of the Rocky Mountains down to the rolling foot-hills until they flatten out and decline at low angles beneath the great trough or syncline which crosses the Peace River. It is the opinion of Prof. Gwillim, therefore, that the portion most worthy of closer investigation is the strip of country lying between the gentle dip towards the great syncline and the area of disturbed geology adjacent to the mountains.

The following formations, says the report, were met with in descending order.

1. Smoky River shales.
 2. Dunvegan sandstones.
 3. St. John shale.
 4. Bullhead sandstone, with trassic shales and sandstones below. The Bullhead sandstones are considered to be the shoreward equivalent of the Peace River sandstones and Loon River shales. It is near the base of the latter that oil is found on the lower Peace River at about 1,100 feet below the river level.
- Prof. Gwillim's report says that the Bullhead sand-

stone is a geological equivalent to the oil or tar-bearing strata of the lower Peace River, Athabaska River and of the Black Diamond area in Southern Alberta. "These Bullhead sandstones are structurally favorable, that is, there are rolls, saddles or anticlines, covered by St. John shale," the report continues, "which is impervious enough to hold down any oil beneath them. There is no proof that oil exists in or beneath the Bullhead sandstones, but the possibilities are sufficient to justify extensive reconnaissance work in adjacent areas by a large oil corporation."

Commenting upon the report of Prof. Gwillim, Mr. Pattullo says: "From the work carried on by Prof. Gwillim last year it seems highly desirable that much more extensive work of a general character should be carried on during the coming year, with some detail work in certain localities. The report is of a valuable character, and the good work must be continued this year."

MR. F. B. MACAULAY'S APPOSITE PARABLE.

The House of John Bull & Sons.

"An American professor has been kind enough to suggest that Canada is insolvent because she does not pay gold. We may compare our position with that of two men, each of whom owns a number of highly profitable farms, and has other industries. One however, is more southerly than the other, and can grow crops which the other cannot. The northern man buys the southern products. He offers in payment wheat or flour, but is told, 'I do not need that; I have all I require of my own.' He is offered beef and pork, with the same answer. He is offered lumber and paper, and is told, 'Yes, I will take some of that, but not enough to cover the amount you owe me.' The southern man says, 'Pay me gold,' which of course the northern man cannot get anywhere. Finally the southern man says, 'I will take a mortgage on some of your farms for the amount, but I will only take it at fifteen per cent. discount.' Is the northern insolvent? Rubbish. He is highly prosperous and able to pay everything, if only his southern uncle would take the kind of goods which he produces. Insolvent? Not at all, he is merely showing bad business judgment in buying from the wrong person. He begins to look around, and finally remembers that he actually belongs to a big firm, John Bull and Sons, and that another member of that firm, who happens to be his father, has factories that can supply much of what he needs, and another member a brother, has southern farms which could be developed to supply all the tropical goods he requires. What does he do? He begins to deal with the members of his own firm, and to develop their resources, and soon his problems come to an end.

"That is the lesson from our exchange situation with the United States."

The coal problem of the United States, and of Canada also, is to a great extent one of haphazard production, uncoordinated with transportation facilities; and varying seasonal requirements for coal accompanied by seasonal limitations of transportation and production. The coal problem is probably seventy-five per cent a transportation question.

The Ore Deposits of Goudreau and Magpie-Hawk Areas, Michipicoten District, Ont.

The Summary Report of the Geological Survey, Part. E., 1918, contains a detailed report by W. H. Collins on the pyrite and iron ores of the Michipicoten District in which pyrite mining was greatly stimulated by increased domestic demand for sulphuric acid caused by war requirements and the cessation of shipments of Spanish pyrite. In 1918 the Survey entered this field with the intention of aiding prospecting and development.

An attempt was made to assign some definite stratigraphic horizon in the Keewatin to the formation which carries the iron ore and pyrite. A tentative effort was made to recognize some of the members of the Keewatin group, arrange them in order of age, and even to represent them thus on the maps. The Report states:

The attempt met with only a small degree of success. It was soon found in Goudreau area, explored first, that most of the iron-formation rests upon light coloured porphyries which, being volcanic flows, are, therefore, older. Also, that the flows above the iron-formation are largely, if not altogether, dark-coloured greenstones. On this basis the Keewatin in Goudreau area was separated into three parts; an older group of light-coloured acid volcanics, an intermediate one of iron-formation, and a younger one of dark-coloured, basic volcanics. Later on, however, it developed that this classification is only approximate; that there are a few acid volcanics apparently younger than the iron-formation and quite a few basic volcanics older than it. Nevertheless, the subdivision was successfully used in searching for and locating belts of iron-formation not heretofore known, so it has some practical value.

An attempt to make a like threefold subdivision in Magpie-Hawk area failed. It is quite remarkable how many of the volcanics found in Goudreau area are also present in this area; but the distinction between acid and basic volcanics is not so pronounced. There are many of intermediate character, which could not be placed unhesitatingly in one division or the other, even on a lithological basis. It was also discovered, in the case of the Bartlett range, that the iron-formation does not lie between acid and basic flows but apparently within one acid tuffaceous formation.

The main structural relationships of the rocks are shown in Fig. 1.

Pyrite and Iron Ores.

Pyrite, siderite and hematite are constituent part of the Keewatin iron-formation in Michipicoten District, and the pyrite deposits may be classed as range deposits for the most part. There are a few smaller bodies of high-grade pyrite presumably derived from the range deposits by solution, transportation and re-deposition. There are still other small bodies in the

Pleistocene drift, where the drift has been replaced by pyrite sand and granular silica, deposited from the mineralized waters that drain off the iron ranges. Thus there are three distinct types of pyrite deposits in this district.

An example of a replacement deposit in the drift is shown in Fig. 2, which refers to the Rand Consolidated Company's pit at Goudreau. This deposit

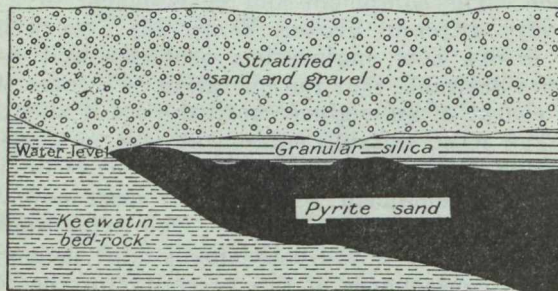


Figure 2. Diagram showing geological relationships of the body of pyrite sand in the Rand Consolidated Company's pit, Goudreau. This body is younger than the Pleistocene drift.

is modern in age, and the concentration is so perfect that the sand shows 95 per cent pyrite by analysis. The Report discusses at length the probable process by which this pyrite sand was laid down, and remarks that the similarity between the recent replacement deposits and the Keewatin iron ranges is sufficiently remarkable "to suggest that the banded silica and pyrite of the latter may have been concentrated by processes of solution and redeposition analogous to those which manifestly gave rise to the younger deposits."

The iron formation is composed essentially of banded silica, pyrite and siderite or sideritic limestone arranged in stratiform form. The banded silica is so perfectly stratified that the whole iron formation must be assumed to have been deposited horizontally in the first place and over considerable areas. Later earth movements have complicated the structure to an inexplicable extent.

An effort has been made in Figures 3 and 4 to indicate the general stratigraphic character of the iron-formation by placing side by side cross sections of different parts of the ranges in both areas, those in Figure 3 representing surface exposures, whereas those in Figure 4 are from diamond-drill borings. The sections were selected so as to be as repre-

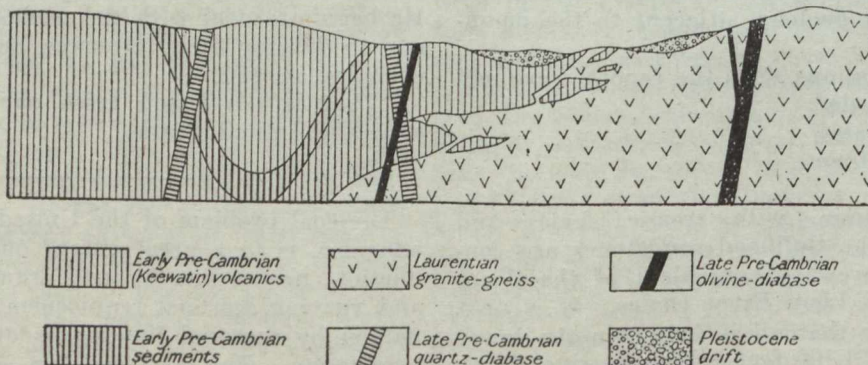


Figure 1. Diagram representing the main structural relationships of the rocks in Michipicoten district.

sentative as possible of the principal ranges examined. They do not, however, illustrate such extreme types as the body of siderite at Leg lake, Magpie-Hawk area, or the Dreany range, near mile 182 on the railway, which consists solely of banded silica.

The iron ranges vary in thickness from about 2 feet to 500 feet, and in apparent length from a few yards to more than 7 miles. They are associated exclusively with volcanic formations. No clastic sediments occur near them, with the exception of the conglomerate and sideritic greywacke on Parks lake, and these appear to be only a volcanic tuff modified by water action. As a rule the underlying volcanics are acid, and more or less tuffaceous. The overlying volcanics are prevailingly greenstones, especially in Goudreau area, where they are also ellipsoidal but the range east of Parks lake lies in part between acid flows and tuffs. There is nothing then in the environment of the iron-formation that suggests it to be sedimentary.

The successive materials passed through in drilling in this district are discontinuous, lenticular bodies more or less complexly imbricated, and drill holes must be placed fairly closely together before the sections can be interpreted accurately. But when any range is considered as a whole (see Fig. 3) the general sequence, namely, banded silica, pyrite (or hematite), siderite, is obvious and without exception, whether all three or only two members are present.

Among the properties described are those of the Nichols Chemical Co. lying immediately north-east of Goudreau Station on the Algoma Central, where in 1918 ore was being taken at the rate of 150,000 tons for the season, and 300 men were employed.

The Rand Consolidated Co. holds properties which are a continuation of the Nichol Company's main range known as the Morrison No. 4 Group. Another property owned by this Company is the Morrison No. 2 on which are two parallel iron ranges, on the southern range of which much diamond drilling has been done along a distance of 3,800 ft. These holes show a pyrite deposit ranging in thickness from 12 to 50 ft. at a depth of from 60 to 200 ft., which, assuming the ore body to be continuous between the holes, would indicate a probable ore content of 1,250,000 tons. The drill-core analyses are not available but it is intimated that a large part of the ore may not contain more than between 25 to 35 per cent of sulphur.

Considerable space is devoted to a description of the Josephine Mine, which is too long to quote here.

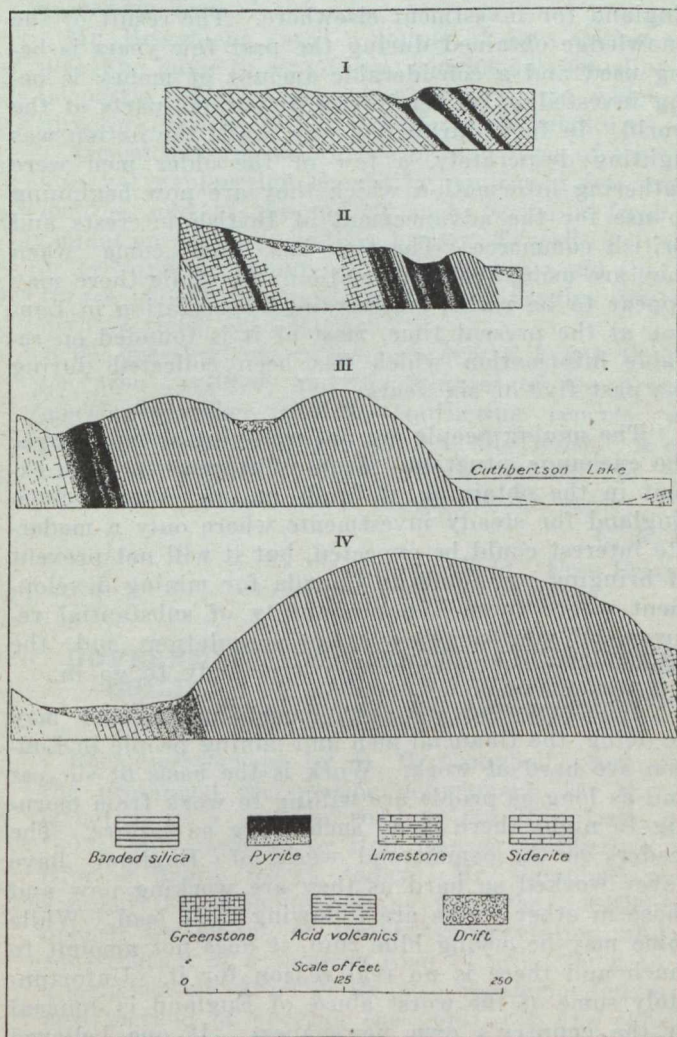


Figure 3. Cross-sections of iron formations showing the stratigraphic arrangement of banded silica, pyrite, and siderite, or sideritic limestone, and the topographic expression of each. I. Near middle of mining location J. L. 10, Goudreau area. II. Along east boundary of mining location A. C. 39, Goudreau area. III. Near east end of Cuthbertson lake, Magpie-Hawk area. IV. Near middle of the Bartlett group, Magpie-Hawk area.

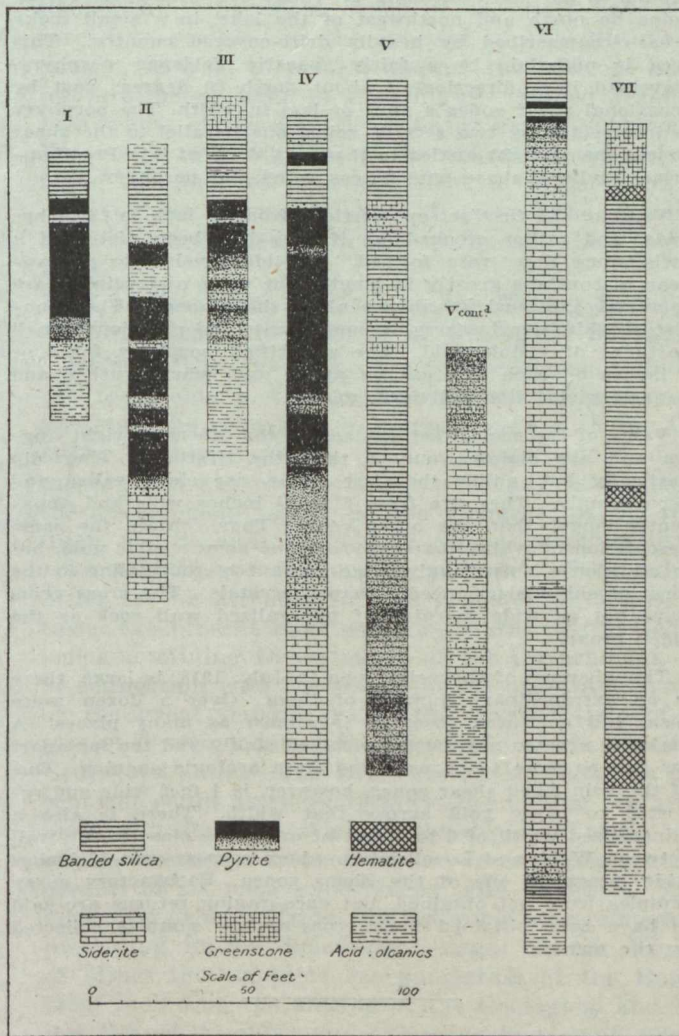


Figure 4. Diamond drill sections of iron formations showing in more detail than Figure 3 the stratigraphic arrangement of banded silica, pyrite, and siderite, or sideritic limestone. The drill logs have been corrected so as to show true thickness in each case. I. Hole No. 15, C deposit, Nichols Chemical Company's property, Goudreau area. II. Hole No. 8, Morrison's No. 2 property, Goudreau area. III. Hole No. 16, Morrison's No. 3 property. IV. Hole No. 8, Morrison No. 1 property. V. Hole No. 1, Bartlett property, Magpie-Hawk area between 950 feet and 30 feet. VI. Hole No. 111, Helen mine, Magpie-Hawk area between 450 feet and 850 feet.

Thirteen drill holes are said to have been put down, which indicate the presence of an oval area of iron ore, which, if reckoned on a basis of all ore carrying over 30 per cent metallic iron, would give an estimated content of 2,250,000 tons of hematite, or 1,300,000 tons at a 50 per cent metallic iron basis. At least 850,000 tons is believed to be recoverable.

Gold.

Gold was reported from near Webb lake, Goudreau area, early in 1918. Considerable prospecting ensued during the summer of that year, trending in the direction of Missinabi station, on the Canadian Pacific railway. Fresh discoveries were reported during July and August from the east side of township 26, range 27. Only those within the Goudreau map-area, however, were visited by the writer.

The most important among these lie in the McCarthy-Webb group of claims situated just north of Webb lake. Small veins of the same appearance were seen near S.S.M. 1778 and also on the portage between Bearpaw and Pine lakes. At all three places the prospective ore-bodies are quartz veins intersecting on ash-grey feldspar porphyry, the second Keewatin formation described in this report.

McCarthy-Webb Property. Messrs. D. J. McCarthy and W. H. Webb, Sault Ste. Marie, Ontario, hold and are doing the assessment work on a group of seven claims situated around Webb lake, township 27, range 27. The gold-bearing veins lie north and northwest of the lake, in a small rocky area circumscribed by heavily drift-covered country. This area is underlain by a fairly massive feldspar porphyry, traversed in a direction of about north 60 degrees east by occasional shear zones a yard or less in width. The porphyry is intersected by two sets of veins, one parallel to the shear zones, one at right angles to them. A dyke of late Pre-Cambrian olivine diabase cuts across veins and porphyry alike.

Veins of the first set are vertical, from $\frac{1}{2}$ -inch to 18 inches wide, and rather crooked, as if they had been disturbed a little since they were formed. Individual veins do not appear to continue greatly in length, but veins and veinlets are commonly grouped lengthwise along-shear zones. They consist of white quartz carrying some pyrite and occasional small particles of visible gold. The schistified porphyry for 2 or 3 inches on each side carries pyrite and, when crushed and panned, yields finely divided gold.

Veins of the second set cut across the others at right angles and are plainly younger than the first set. They dip vertically but, unlike the first series, are clean-walled and occur singly. They are from 6 to 24 inches wide and apparently longer than the other veins. They contain the same association of white quartz, pyrite, and some visible gold, but in addition a surprisingly large amount of tourmaline in the form of shiny black, needle-shaped crystals. The cross-veins have not as wide margins of mineralized wall rock as the older group.

Though none of the veins seen in July, 1918, is large, there is an extraordinary number of them. Over a dozen were seen, and gold was observed in almost as many places. A majority are too narrow to be mined singly and too far apart for two or more to be exploited from a single opening. One of the vein-filled shear zones, however, is 4 feet wide and reported to carry gold across that width. There is also a mineralized width of 3 to 4 feet at one place close to the trail between Webb and Lovell lakes, where a cross-vein 18 inches wide intersects one of the Shear zones. Satisfactory assay samples were not obtained, but encouraging returns are said to have been obtained from cross-section samples collected by the owners.

General Sir Newton Moore, after visiting the steel and coal plants in Nova Scotia recently, expressed his opinion as follows: "What is essential is that production be increased to the maximum output of the plants and mines, thus reducing costs." This opinion may seem trite, but it is none the less true, and it has a much wider application than to the conditions of Nova Scotia.

DON'T WORRY ABOUT ENGLAND.

Mr. J. B. Tyrrell, the well-known Toronto mining engineer, who has just returned to Toronto, from a business trip to England, is decidedly optimistic over the outlook in mining and commercial circles generally in England. English mining companies are largely interested in gold mines and Mr. Tyrrell says that the old established mining industries not only went on receiving small dividends during the war but the added price for gold as well. The South African mines do not have to sell in the English market now and when gold is selling as it does now for 129 shillings an ounce, the enormous profits being earned can be understood. The owners and shareholders of these mines, who had to economize closely during the war, find that the exchange may be against England in matters of trade, but in the matter of gold mining it is very much in her favor.

"So the gold miners are all feeling reasonably comfortable", said Mr. Tyrrell, "The shareholders in oil companies have also been doing well since the war. These companies had men out locating good new districts, but it was impossible at that time either to purchase or to conduct big drilling campaigns. Now the war is over and money can again be sent out of England for investment elsewhere. The result of the knowledge obtained during the past few years is being used and a considerable amount of money is being invested in oil territories in various parts of the world. In fact, during the war, while the nation was fighting desperately, a few of the older men were gathering information which they are now beginning to use for the advancement of British interests and British commerce. The time has now come when they are using that information. So while there may appear to be rather unrestrained speculation in London at the present time, most of it is founded on reliable information which has been collected during the past five or six years.

"The mining people are not worrying seriously over the exchange situation. True, it happens to some extent in the obtaining of funds in this country from England for steady investments where only a moderate interest could be expected, but it will not prevent of bringing out funds to Canada for mining development where there is a probability of substantial returns. If you can show a fair speculation and the chance of good returns they are ready to go in.

"Whatever the laboring classes in England may be doing, the financial men and mining people in London are hard at work. Work is the basis of success and as long as people are willing to work from morning to night there is no such thing as failure. The leaders in the commercial world of England have never worked so hard as they are working now and those in other walks are following their lead. While some may be crying blue ruin, it does not amount to much and there is no real reason for it. Unfortunately some of the worst abuse of England is Journal in the country's own newspapers. If one believed some of the London papers, he would be convinced that the British Government and executive were the biggest rogues in the country. Possibly the Irish people read these attacks and take them at their face value, but the people as a whole in England know how to discount these attacks."

THE GOLD PAN MINES, MANITOBA.

Several hundred shareholders in the Gold Pan Mines, Limited, met in response to a call by the directors. A report had been received from R. W. Brigstocke, who recently sampled the property near Gold Lake, and the directors desired to sound the shareholders as to the proper action to take.

It will be remembered that J. B. Tyrrell, inspected the claim last October, but as at that date the shaft had not been unwatered, he could only form an opinion by surface examination and from hearsay. He was, however, impressed with the desirability of continuing exploratory work underground, and had expected to be able to return later in the winter and sample the Gold Pan, but was called at short notice to London. The property having been put into shape for an examination by Mr. Phillips, superintendent, the directors felt forced to find another engineer as they did not care to spend money in what might prove a vain quest. Their choice fell upon Mr. Brigstocke, who had worked in close connection with Mr. Tyrrell, and has for the past fifteen years confined himself closely to the pre-Cambrian formations. He is well known in Sudbury, Cobalt and Porcupine, having been manager of the Drummond silver mine, and the Long Lake gold mine, as well as acted as consulting engineer in numerous cases.

Mr. Brigstocke spent a couple of days taking samples, and came to an adverse conclusion regarding the property. Thus there were two reports which the directors desired to lay before the shareholders.

Almost unanimously, those present were of the opinion that exploration should be continued for several months, and at the end of such period a fresh examination be made, either by Mr. Tyrrell or some other engineer recognized as competent, and that the future should be regulated by the results disclosed by this third examination.

The meeting was called to order by Frank O. Fowler, who presided, and the minutes of the previous meeting together with the conflicting reports were read by the secretary, Gordon C. McTavish. A copy of Mr. Brigstocke's report will be mailed to each shareholder as soon as it comes off the press.

C. A. B.

Winnipeg "Free Press"

GOVERNMENT ENGINEER RECOMMENDS BUILDING OF LAND AND WATER ROAD TO RICE LAKE, MANITOBA.

Recommendations by V. H. Campbell, engineer of the provincial reclamation department, for the construction of a summer road to the Rice Lake goldfields, were received by Hon. George A. Grierson, minister of public works, today. Mr. Campbell recommended that communications with the goldfields be opened by means of water transportation and the construction of a summer road 14 miles long, to cost approximately \$15,000. He also recommended as the best method of opening the goldfields, the construction of a light railway from Great Falls, on the Winnipeg railway, into the interior, a project which would entail an expenditure of approximately \$350,000. It was announced today that the latter recommendation would not be considered by the government at present.

The plan which will receive government approval is the water and land route, it is stated. Launches will be employed to traverse the Winnipeg river to Bellevue landing, a distance of 4 miles. From there a summer road will be constructed for a distance of 14 miles to Caribou lake, in the heart of the mining country. This road would traverse a country part of which is thickly covered with spruce and poplar and the remainder with granite boulders. From Caribou Lake, the major portion of the mines are within easy canoe distance.

It was also announced that the construction of the road would be contingent upon an undertaking on the part of the mine owners to furnish the launches necessary to carry material over the water route. On the road recommended by Mr. Campbell there is only one portage, in contrast to the present one, which has fifteen.

TEXT OF TELEGRAM SENT TO OTTAWA BY THE MINING SOCIETY OF NOVA SCOTIA.

"It has come to the notice of the Council of the Mining Society of N. S., that owing to the inadequate Salaries paid by the Survey and Mines Branch of the Geological Department, some of the staff have been forced to resign. In the interest of the Mining Industry we wish to protest against the scale of Salaries now being paid to such highly trained technical men whose services to the country are of such value. We would urge that steps be taken immediately to make the Salaries paid sufficient to attract and retain for the services a class of men of the standard, formerly associated with the work of the Department."

Text of Resolution adopted by the Mining Society of Nova Scotia re Salaries of Geological Survey.

RESOLVED—That the Council recommend that at the forthcoming Annual Meeting of the Society the Secretary be requested to communicate with the Canadian Mining Institute, the Canadian Society of Engineers and any other Canadian Society interested in the development of the mining resources of the Dominion, to the end that united action be taken by all representative of the mining industry of Canada to bring to the attention of the Minister of Mines, Ottawa, the present unsatisfactory status of the Geological and Mining Departments of the Government, and in connection with the foregoing, to urge that in view of the great importance at the present time of the utmost development of the mines of Canada which the Geological and Mining Branches of the Canadian Government could assist materially, the mining fraternity view with the greatest alarm the depletion of the staff of the Geological Branch by the recent resignation of several of its most experienced and valuable members, due principally to the low scale of remuneration prevailing in the department, urges on the Minister of Mines the complete reorganization of the Department including the uniting of the Geological and Mining Branches under one executive head, and providing for a salary scale and such regulations as to service under the Mines Department as will attract and hold the services of the geologists and mining engineers of experience and repute, and further encourage graduates of our engineering universities to enter the service of the Department with a view to its being their life work.

Our Northern Ontario Letter

THE SILVER MINES.

As time goes on and the New York quotations for commercial bar silver show no signs of receding, and, as the rate of exchange between Canada and the United States continues to rule high, the first-named condition is gradually being accepted as more or less permanent. The high rate of exchange, while not expected to long continue as at present is nevertheless believed to be a condition to reckon with for at least several months, although it may have a gradual decline.

Provided these fairly generally accepted conclusions prove to be correct, the net profit to be derived from the operation of the silver mines of Cobalt during 1920 may be expected to surpass any previous record. To-day the leading mines are realizing more than \$1 an ounce net profit on the silver they produce. Even at the smaller mines, believed some time ago to be "on their last legs," so to speak, the margin per ounce of net profit now going to their treasury is almost equal to the gross value of their entire output had quotations remained as in the opening year of the late war.

Max Morgenstern, of New York, minority share holder in the Buffalo Mines has failed to secure an injunction restraining the company from passing a by-law authorizing the sale of the company's assets to the Mining Corporation of Canada for \$462,000. The application was dismissed in the absence of any proof of fraudulent intent being established. As a consequence of this, it would appear, the Mining Corporation will now be free to carry out its proposed scheme of development on the recently acquired Buffalo Mine.

Development work on the University property of the La Rose Consolidated has recently resulted in opening up encouraging quantities of high grade ore. As a result of this as well as the expectation that the annual report for 1919 will be quite favorable, the La Rose is attracting more than usual attention.

Reports published in some of the Toronto papers that the Trethewey had made another shipment of high grade ore from its Castle property at Gowanda, are not correct. These reports had it that \$60,000 worth of ore had just been sent out. The truth is that the Trethewey is making good headway in the development of the Castle, and is meeting with exceptionally favorable results. Early in January a shipment of about ten tons of high grade ore sent to Cobalt for treatment. As regards the present, there is no indication of a shipment for another month or so at least. It is learned that about five tons or so is now in bags at the mine as a part of that being assembled for the second shipment.

A plan is under way to bring about a merger of the Adanac mine with the Victory Silver Mines. The latter was formerly known as the Hylands property and was only recently taken over under the new name. It is situated between the Ophir and the Gifford Extension, and lies within 660 feet of the Adanac. The plan is to merge the two properties, with a capitalization of \$2,500,000 shares divided into 2,500,000

shares of the par value of \$1 each. Of this, 1,000,000 shares are to go to shareholders of the Adanac and 1,000,000 shares to the Victory Silver Mines, thus leaving 500,000 shares in the treasury with which to finance operations. It is believed that the acquisition of the Victory Silver Mines' property would greatly strengthen the outlook for the Adanac, as it comprises a piece of territory where geological conditions are very favorable which has not been explored. Provided such a consolidation were to be carried out, the shareholders of the Adanac would receive one share of the new issue for three shares of the old, and would have the advantage of the money to be derived from the sale of half a million treasury shares for development work, as compared with a depleted treasury as at present.

The mining interests of the province of Ontario have formed themselves into a new organization known as the Ontario Mining Association. Their aim will be to assist the mining industry. Contrary to intimation in press despatched, the organization will not play politics but will bend its effort toward closer cooperation between all concerned. The officers appointed at the first meeting are provisional. Permanent officials will receive endorsement at a subsequent meeting. This may be held in Toronto during the second week in March at which time a large number of mining men will be there for the purpose of attending the 22nd annual meeting of the Canadian Mining Institute, to be held in the King Edward Hotel, on the 8th, 9th, and 10th of March.

The Dodds property, having been purchased by Toronto and Montreal interests, is now figuring in a merger with the Silver Bullion property. Both properties are in the Leroy section of the Gowanda district. The merger is to have a capitalization of \$1,500,000 made up of 1,500,000 shares of the par value of \$1 each. It is stated that no stock will be offered for sale, the proposition being more or less a close corporation, the finances for development work being raised privately.

JANUARY ORE STATEMENT

Following is a statement of ore shipments over the T. & N. O. Ry., for the month ending January 31st, in tons of 2,000 lbs.

Silver Ore.		Tons.
Cobalt Proper.		
1. Crown Reserve		19.97
3. Dominion Reduction		29.00
2. Coniagas		125.95
4. Hudson Bay		30.81
5. LaRose		106.99
6. McKinley-Darragh		107.98
7. Northern Customs		43.96
8. O'Brien		64.01
9. Peterson Lake		30.54
10. Temiskaming		92.54
11. Trethewey		71.03
		722.78

The above shipments were made to the following Companies:

CANADA

Coniagas Reduction Co., Thorold.....	68.14
Deloro Smelting & Refining Co., Marmora..	263.93

UNITED STATES

American Smelting & Refining Co., Pueblo..	252.19
American Smelting & Refining Co., Perth Amboy	30.54
Pennsylvania Smelter, Carnegie.	107.98

722.78

Price of Silver.

Jan. 12th. Highest	137.000
Jan. 16th. Lowest	128.500
Average	132.827

THE GOLD MINES.

The premium on United States money continues to be an important factor in swelling the amount of revenue at the gold mines. In discussing the matter with the correspondent of the Canadian Mining Journal, A. F. Brigham, general manager of the Hollinger Consolidated, stated that while such a premium was quite welcome under the circumstances, yet a condition resembling normal was much to be preferred.

The labor supply at the gold mines continues to improve gradually, and the efficiency of the men has improved. With 1,100 men and 58 machines employed, the Hollinger is now treating an average of about 2,300 tons daily, or an average of well over two tons per man on the pay-roll. This compares with a low record of less than one and a half tons about the time the armistice was signed with the Central powers. Current costs are \$4.77 per ton, and mill heads average around \$8.75 a ton. The average value of the ore in reserve is estimated at \$9.09 per ton, and it may thus be seen that the policy of the management is exceedingly conservative and that the physical condition of the mine is being strengthened rather than impaired. From 170 to 180 stamps are being operated, the balance of the total of 200 not yet having been brought into play. As regards future plans, it is officially learned that instead of sending a large volume of ore through one main haulage level as was the former practice, it has been decided to establish a complete electric haulage unit at intervals of every 150 feet in depth, beginning at 500 feet. This will avoid too great a centralization and attendant congestion. While endeavoring to pay as high wages as possible so as to attract adequate men to the mine, the general manager is also keeping in mind that while paying dividends which represent only reasonable interest on the capital invested, he must also provide earnings which will represent a reasonable return of capital involved.

The directors of the Dome Mine will pay a visit to the property about the end of February. The president, Mr. Bache, will not visit the mine until after the close of the company's fiscal year, March 31st. As regards achievements at the Dome, nothing of an official nature has been given out for some months. Reports that mill heads have been ranging from \$7 to \$8 per ton have been interpreted in the North as an indication that the physical condition of the mine may be impaired. As to this, the interpretation may be entirely wrong, but in the absence of official information such a belief is gaining ground. In the meantime, with a force of between 300 and 400 men on the

pay-roll and the steady shipment of gold bullion from South Porcupine lends to the operation an outward appearance of prosperity. In connection with the option which the company holds on the Dome Extension, it is intimated in usually well informed circles that a request may be made for an extension of six months time.

The Clifton-Porcupine has everything in readiness to turn on electricity on March 1st at which time the number of machines employed will be doubled from two to four. At present development work is being carried on at the 200-ft level. It is proposed to cross-cut east and west over a total length of about 800 feet for the purpose of opening up eleven known veins. Accordingly as these veins are opened up, the policy will be to drift along those which appear to be the most important. Up to the present a substantial tonnage of ore has been opened up on the Boulder vein. A two-ton shipment was made recently to the Temiskaming Ore Testing Laboratory at Cobalt for the purpose of testing its value.

The McIntyre Porcupine main shaft is nearing the 1,600 ft. level and is soon to become the deepest shaft in this country. Ore deposition is being found to continue without any signs of diminution. The mill at present is treating upwards of 550 tons daily and the output is not far under \$6,000 every twenty-four hours. A force of approximately 360 men and about 30 machines are employed.

Reports are current that the controlling interests of the Porcupine Lake Gold Mining Company are considering a plan to resume work in the spring. The property is situated at the North end of Porcupine Lake and has been idle for some five years. When operated in 1914 a shaft was put down about 285 feet. Ore deposition was found to be more or less patchy, but would appear to offer inducement to proceed further with exploration work.

It is learned that the Tashorn Mining Company may decide to arrange for the re-opening of their property situated at Tashota in the Kowkash mining district. Whether or not the plan includes a re-organization, sale, or private capital advancement had not been learned. It will be recalled that this was about the only property to be explored to any very great extent following the rush of prospectors to the Kowkash field some years ago. The result of work at that time on the Tashorn was generally understood to have been favorable. A shaft was driven to a depth of something like 200 feet, and considerable drifting was done.

The Lake Shore Mine at Kirkland is operating on a normal basis, and mill heads are again running high. From achievements during the opening month of the new year, it is evident that the 1920 yield will greatly exceed that of 1919. A full force of men has served to bring the mill up to full capacity.

At the Wright-Hargreaves all is in readiness to proceed with the installation of the big new mill. All the heavy parts have been transported to the mine, and with the arrival of spring the work of placing the concrete foundations will be commenced, following

which the installation of the equipment will take place. It is believed that barring unforeseen obstacles the Wright-Hargreaves will be treating close to two hundred tons of ore daily before the end of the summer. The mine is situated adjacent to the Lake Shore, has the eastward continuation of the Lake Shore vein system, and is under efficient management. It owns nearly three-quarters of a mile in length of the auriferous zone which has made the Kirkland Lake camp an important gold producer.

At such properties as the Ontario-Kirkland, the Canadian-Kirkland, Green-Kirkland, Bidgood and Fidelity, advice received is such as to arouse general optimism over the likelihood of the extensive growth of the camp.

The new mining plant on the Mondeau property of the Peerless Mining Company has been placed in operation, and underground operations have been resumed at full blast. A force of about 40 men are employed. It is stated that the Timmins' interests of the Hollinger are interested in the exploration and development of the Mondeau.

The station at the 500-ft. level of the Miller Independence mine has been completed and the work of driving a cross-cut north to the downward continuation of the rich ore body is to commence at once. It will be recalled that the gold tellurides found some time ago caused somewhat of a sensation. The sinking of a central shaft so as to cut the ore body at a depth of 500 feet followed, and as this program nears completion it is becoming the centre of considerable interest. W. E. Simpson, the newly appointed general manager has taken up residence at the mine.

MORETON FREWEN POINTS OUT NECESSITY TO INCREASE SILVER PRODUCTION TO PROTECT OUR GOLD RESERVES

N. Y.—Moreton Frewen, British economist and authority on silver says: "The Wall Street Journal of Feb. 9, contains a digest of our Board of Trade figures from the Manchester Guardian which presents the most interesting exchange position in modern economics. The writer has spent much time in the far East, and the press of this Continent has never perhaps taken seriously my conviction that the great and new industrialism of Asia, showing itself in the cotton mills of Bombay, the jute mills of Calcutta, the great iron industries of Hankau—a hundred more, were created and their baneful competition fostered by low exchange and equally that the low exchange value of silver was destroying your exports to Asia of cotton and wheat and lumber and steel rails.

"Before giving figures of the cotton trade arising from the recent great jump in silver, let me refer to the then quite unprecedented fall in silver in 1907—the greatest fall in any 18-month period, particularly marked during the last nine months of 1907. Elihu Root, then secretary of state, at request of Senator Lodge sent a circular to all your consuls in Asia asking information. The circular was sent out some months too soon to secure maximum results in case of remote provinces in China. But the replies were most educational and were all the same way. I must confine myself to a single small table from Consul Greene at Dalny, in Manchuria:

Dalny Value of Imports.

	Cotton Goods	Flour Exchange
March quarter, 1907	\$709,969	\$301,123 .57
December quarter, 1907	204,904	73,969 .47

"Still only half awakened and relying chiefly on what Prof. Francis A. Walker had written me in 18-94, that the world-wide financial crisis had resulted from the great break in silver exchange in 1893, you may recall perhaps that in early months of 1907 I anticipated a great financial crisis at hand, publishing this forecast in many newspapers and reviews here and in England.

"Now let us look at the figures from the Manchester Guardian. The sterling rise in silver last year was from 48½ pence in January to 76¼ in December. In January England's export of piece goods to China was six million yards, in October it had risen to 45 million yards and in November was over 40 millions. I expect when we get the returns for December and January the figures will be more sensational still.

"Thus much China; but in case of India every effort was made by her government to tie the rupee down to 16 pence. You recall the flagitious attempt by Lord Reading to purchase in advance all the silver product of this continent at 86 cents an ounce—an attempt happily frustrated by Emmett Boyle and the other western governors. So that the Indian figures, unlike the China figures present a tampered silver exchange, not a free exchange—they represent a final and despairing effort by the government of India to tie silver down and for that very reason a comparison of Bombay and Calcutta cotton imports with the Chinese 'free silver' exchange is all the more interesting. Whereas, then England's piece goods exports rose within the twelvemonth 600%, these exports to Bombay and Calcutta barely doubled (50,000,000 yards to 100,000,000).

"I need hardly point out that the present premium on your dollar and present discount on our pound sterling, if these should continue, will build up your cotton exports to China and India at expense of England. There is today an exchange premium behind your cotton export to, say Shanghai, represented by the full fall in sterling exchange. Massachusetts for three Shanghai taels gets five gold dollars, Manchester for the same three taels gets not a sovereign, but only eleven-sixteenths of a sovereign. Although it is far from clear at this moment what the government of India is aiming at, one point is certain, they have fixed their rupee exchange at such a price that silver can never again fall below 129 cents an ounce. As this becomes generally recognized, new silver mines should be opened and the silver urgently needed to protect our western gold reserves against the Asiatic drain should be forthcoming. But the expansion will require time. Which is to win in this terrible race the man in the silver mine or the man in the pulp mill?

"Let me appeal confidently to public opinion here to express itself as the accumulating evidence presents this mighty exchange problem more fully. It is a problem on which all other exchange problems turn. From the Babylonian era, as Prof. Max Muller pointed out, at what time the ratio was 1 to 14, until 1873, because of 'free coinage' at leading mints the ratio of value of the two metals in the world's market varied never more widely than between 1 to 14 and 1 to 16. Calonne's French Mint law the law, the law of 1903, is simplicity itself and is invincible in its

simplicity. Let me leave it on your pages for a new generation to admire.

"To every person bringing to the mint 1 kilo of gold, nine-tenths fine the same shall be given back to him transformed into 155 disks of 20 francs, of which the total shall be reckoned at 3100 francs. And to all persons bringing 1 kilo of silver nine-tenths fine, the same kilo shall be returned to him coined into 40 five-franc pieces of which the total shall be equal to 200 francs. The debtor may tender these gold and silver disks at his option and can obtain for them a full receipt for his debt."—Boston News Bureau.

Detroit, Mich. Feb. 20|20.

The Editor,
Canadian Mining Journal.

Dear Sir:—

The effort of the mining engineers of British Columbia to receive government recognition if not entirely successful will have accomplished much in that it has once more started their Eastern brethren thinking and talking on the subject. Thought and words following a good sample should beget action. In the vernacular of the day "They started something". I do not intend to comment on the British Columbia action as the Journal has covered their case both pro and con very ably. However I would like to point out that recently the engineers of Ontario had an opportunity to insert an opening wedge which seems to have been entirely overlooked.

Last year as we all know the Ontario Government framed a remarkably good blue-sky law—remarkably good inasmuch as it afforded great protection to the investing public and made provision for its own enforcement. The reason the law was drafted was because public sentiment demanded it—get that—public sentiment demanded it. But certain "so-called" brokers saw where their combs were going to be cut and hurried long dispatches over the wires to the Toronto papers telling of the great indignation and dissatisfaction among mining men throughout the north. Being in the North at the time both in Cobalt and Porcupine I had an opportunity to discuss the provisions of the law with several men who were claim owners and therefore most deeply interested. The majority of these men seemed inclined to favor it and certainly weren't tearing the rugs with rage as we were lead to believe by newspaper reports. But certain elements saw the handwriting on the wall and proceeded with all their might to do battle for their very existence. With the help of all whom they could coax or coerce they attacked the bill in its one vulnerable point—namely that political influence would largely determine the findings of the government officials appointed to enforce the law.

Here is where the engineers lost their opportunity. The government wanted to pass the bill but the first rule of politics is "If you can't make a friend don't make an enemy." Now if the engineers had offered to form themselves into a body patterned for example like the Ontario Land Surveyor's Association and take over the duties that were to be assigned to the different district inspectors, the government would have been forced to accept the offer to save its face with the public and the broker's argument re political influence would have been met. Those who read the draft of the bill will agree that any qualified member of an association with an iron-bound set of

rules and definitions could meet the terms of the bill with fairness to all concerned.

Maybe it's not too late yet for although the Ontario Govt. has changed public sentiment throughout the country demands something in the line of a blue-sky law. How are engineers organized and equipped to get what they are after—government recognition through the medium of this law? Last time one element of the mining community put up a real fight and got what they wanted. Why can't the engineers be next

Trusting that the Journal can scare up a little action or discussion on the subject from its readers who are better qualified to speak than myself, I am

Sincerely,
Dion S. Halford.

C. M. I. TORONTO MEETING.

Provisional programme, Monday, March 8th.

Morning Session.

Addresses of Welcome; Presidential address by D. H. McDougall; Mineral Statistics for 1919 by John McLeish, T. W. Gibson, T. C. Denis and W. Fleet Robertson (or by proxy); General business: Status of the engineer, etc.

Afternoon Session.

"Ferro-Alloys in Canada," by G. C. Mackenzie; "Electric Smelting of Tin Ore," by B. G. Cobb; Two papers on the Plate Mill of the Dominion Iron and Steel co., and one on "Economies in Steel Plant Management," being arranged for by Mr. F. W. Gray, Secretary, Iron and Steel Section; "Iron Ranges of Michipicoten District, Ontario," by W. H. Collins.

Evening Session.

"The Mining and Smelting Operations of the International Nickel Company of Canada," written by The Company Staff. (Lantern slides); "Operations at Alfred Peat Bog" (illustrated by moving pictures), by A. A. Cole; "Some Aspects of the Mining Situation in the Middle West," by R. C. Wallace.

Tuesday, March 9th.

Morning Session.

Formation of Proposed Coal Section of the Institute; "Coal Mining in the Province of Alberta," by J. T. Stirling; "Fuel Problems of Western Canada," by W. J. Dick; "Coal Supply of Canada," by F. W. Gray; "Lignite in Saskatchewan," by A. McLean; "Briquetting Industry," by E. Stansfield.

Afternoon Session.

"Future Prospects for Oil and Gas Production in Ontario," by M. Y. Williams; "Natural Gas in Ontario," by E. S. Estlin; "Oil Possibilities in Western Canada," by D. B. Dowling; "Oil Problems in Canada," by T. O. Bosworth; (Subject to Dr. Bosworth's being in Canada).

Evening Session:

Smoker and Concert in Pompeian Room; (Chairman, Mr. G. G. S. Lindsey and Colonel J. J. Penhale).

Wednesday, March 10th.

Morning Session:

Discussion on Institute's Prospecting Scheme, following an address by J. A. Campbell, M.P., on "Attitude of Canadian Governments toward Mining Development."; "Britannia Mines, British Columbia," by S. J. Schofield; "Progress Notes on the Investigation of the Quebec Asbestos Deposits," by R. Harvie and E. Poitevin; "Asbestos Mining," by J. G. Ross.

Afternoon Session:

Discussion on nickel coinage; "Lost Placers of Ontario," by A. P. Coleman; "Recent Developments in Mining in Northern Ontario," by J. G. McMillan; "Geology of Silver Islet and Vicinity," by T. L. Tanton; "The Nipissing Mine," by H. Park; "Minerals of Eastern Ontario," by J. W. Evans.

Evening.

ANNUAL DINNER at 7.30 p.m. in the Pompeian Room.

British Columbia Letter

METAL MINES

Victoria, B.C. Further evidence that the prospectors are proceeding with their organization in this Province is obtained in reports from Rossland and Hope of the launching of local associations. At Rossland officers have been elected and the machinery prepared for action. The prospectors of Hope, however, are somewhat in advance of this, having passed a resolution for submission to Hon. Wm. Sloan, Minister of Mines, putting themselves on record as viewing with alarm "any proposed legislation which may have a tendency to discourage capital or to lessen the prospectors' chances of reward by placing iron or other ores on the reserve list, ultimately causing him to either abandon his vocation or leave the Province for some other more favorable field." This, no doubt, has reference to a statement made in the "Kings's Speech" on the opening of the Legislative Assembly that legislation might be expected to be placed before the House reserving some of the iron ore deposits of British Columbia in order to facilitate the promotion of the iron and steel industry.

Mining men anticipate that some important amendments to the Placer Mining Act of British Columbia will be considered by the Provincial Legislature during the session now in progress. That changes are in contemplation cannot be doubted inasmuch as the Minister of Mines has made no secret of his dissatisfaction regarding present conditions and of his desire to enunciate a policy calculated to open up placer areas privately held without development. As in all cases of proposed changes to long established law and customs the problem is to work out a method that will have the result sought without imposing anything open to fair criticism on the ground of inequity or injustice.

The position obtaining in this Province with respect to placer mining is that there are over 1100 placer mining leases of which only something over 170 are fully paid up in regard to their rentals. The arrears as can be readily understood when it is stated that the annual fee for a creek claim is \$75 and that for a bench claim \$50, and that \$1000 assessment work is required to be recorded on each lease amount to a very considerable sum in the aggregate. Some have estimated that it totals \$600,000. It is true that the Placer Mining Act contains a provision that the Minister of Mines may cancel any placer lease in arrears of rentals but it is also a fact that the Act permits extension of a period of grace to placer lease holders on their advancing good cause for the benefit of such concession. It is only necessary to refer to the extremely onerous conditions the placer miner has been facing during the past few years to indicate the explanation of what has led to the present unsatisfactory situation.

Mr. Sloan is anxious that placer mining in British Columbia shall be placed on a new footing, with no hardship, if possible, to those who have been engaged in it in the past. While the contemplated amendments have not yet been placed before the Legislature there can be no doubt that, when drafted and submitted, they will be the crystallization of much investigation and matured judgment. It is thought likely that the fees will be reduced, especially in respect of the amount of assessment work required, the same being placed more on a par with the terms of the Mineral Act, only \$100 assessment work per annum being asked for on a lode claim. Probably some equitable arrangement will be made for the payment of arrears on leases held by individuals or companies which have been under development or upon which it can be satisfactorily shown that development is planned. But such ground as is held, manifestly, for purposes of speculation no doubt will be thrown open, the leases being cancelled.

That such legislation will be endorsed cannot be questioned as the importance of stimulating the gold production of the country is generally recognized.

With the acquirement by the Consolidated Mining & Smelting Company of a bond on the Big Interior Group of Mineral Claims, situated about ten miles from the head of Great Central Lake, Vancouver Island energetic development of the property is expected. In his preliminary report for the year 1919 Wm. M. Brewer observes that "it has been handicapped by lack of transportation, also because, although there is good reason to consider that the ore body is so extensive as to promise a tonnage possibly equal to the Hidden Creek Mine of the Granby Company at Anyox or the Britannia Mine, yet the expense of proving its value will necessarily be so great as to tax the resources of any except a corporation as wealthy as the Consolidated. Reference too, is made to the Great Central Lake is likely to overcome the transportation problem should the property prove up to expectations on exploration and development.

The Lucky Four Group, situated on the Cheam Range of Mountains in the New Westminster Mining Division, is another property in which capital has become interested, it being authentically reported that a half interest has been secured by the Guggenheims. Wm. M. Brewer's 1918 report on this property stated that copper ore, almost exclusively chalcopyrite, occurred in a wide zone or stockwork of metamorphosed argillites in which occur many narrow quartz veins. The line of strike of this formation is N 65° W. and dip nearly vertical, with high angle towards the north, so far as can be determined from the present condition of the prospecting work that has been done. The stockwork is bounded on the northerly and southerly side by granodiorite which on the southerly side has a pronounced gneissic structure near the occurrence of ore. Apparently the metamorphosed argillites to a great extent form a capping covering bodies of solid ore." He adds that "from such an examination of the surface as is possible under present conditions the statement is warranted that the property bears all the indications of developing into one of the big copper mines of the Province," but promising to produce ore of a considerably higher grade than that of either the Britannia or Hidden Creek Mines.

Recent reports as to developments on the Indian Chief Group of Mineral Claims, Sidney Inlet, being carried on by the Tidewater Copper Company are extremely satisfactory. This property now is under the general management of H. W. Price who came to British Columbia from the management of an important South American producer. The underground workings have been extended about 600 feet, the Mill at the beach has been remodelled, its capacity being increased to treat about 200 tons of ore a day and water power developed to run the Mill, Compressor, and Electric Light Fans. A new ore body has been discovered on the northerly side of the mineralized zone, which has been crosseut for about 80 feet up to November 4th last. The face then still was in ore assaying 2.62 in copper and from a point 30 feet from the portal to the face on the date indicated the ore averaged 3.96 per cent in copper.

While on the subject of oil exploration in the Peace River it may be noted that the D'Arcy Exploration Company, said to be subsidiary to the Anglo-Persian Oil Company, again is seeking, through a local representative, to obtain certain concessions with regard to that part of the northeastern section of the Province in question. The Company's claims are reported to be endorsed by the Vancouver Board of Trade. The Company asked for the exclusive right of exploration over a block of land sixty miles square. Five years is wanted to carry its work to the point where only one-tenth of the area will be held. In return it undertakes, besides initiating a thorough exploration and, in the event of success, the establishment of an industry on a scale commensurate with the importance of the discovery to hand the Provincial Government the equivalent of one-eighth of the product at the casing-head. Hon. John Oliver, Premier, and Hon. T. D. Pattullo, the minister directly interested, backed by the remainder of the government, are understood to be strongly opposed to the granting of any such concession.

An Order-in-Council has been gazetted at Ottawa doubling the rental on oil and natural gas locations in the western provinces and giving the Minister of the Interior greater control over oil and gas development. The rental in future will be 50 cents an acre for the first year and \$1 for each subsequent year, such increase to apply on all applications submitted after March 1, 1920. Section 40 of the Petroleum and Natural Gas Regulations is rescinded and the following clause substituted: "A Company acquiring by assignment or otherwise a lease under the provisions of these regulations shall be a company registered or licensed in Canada and having its principal place of business within His Majesty's dominions."

Slocan, B.C. Activity continues in the silver belt of the Slocan, B.C. In addition to properties already mentioned development is in progress on the Anna, Meteor, Republic, Tamarack, and Twelfth of July Group. The Meteor was bought by W. A. Buchanan from George H. Aylard and associates. A long crosscut is being driven.

Alice Arm, B.C. Cold weather of exceptional severity has been experienced this winter at Alice Arm. The townspeople were forced to cut through the ice to permit a boat from the outside to reach them. Passengers, freight and mail, however, were taken off

and the trying situation of the residents was much relieved. The launch which has been making regular trips to Anyox, B.C., according to last reports, is frozen to the dock.

THE COLLIERIES

The Settlers Rights Act of 1919, passed by the Legislative Assembly early in that year and which did not receive the signature of the Lieut.-Governor pending advice from the Ottawa authorities, has been disallowed by the Dominion Government. The position taken by the Federal authorities is that the legislation is in conflict with the terms of the Order-in-Council under which the Settlers Rights Act of 1917 was vetoed. It is considered likely that the Provincial Government will ask the Legislature to re-enact the measure, its stand being that nothing is proposed under its authority that is not well within Provincial administrative rights.

To those interested in the coal mining industry in British Columbia the issue of this controversy is of importance. The Act of 1917, which was not disallowed before a number of Provincial Licenses had been issued, is responsible for the opening of the Cassidy Collieries of the Granby Consolidated Mining Smelting & Power Co., Ltd. These licenses, under which the Granby Co. is operating on Vancouver Island, now are the subject of litigation. The Settlers Rights Act of 1919 extended the period in which pioneer settlers within the Esquimalt & Nanaimo Ry. Belt, or the descendants or legal heirs of old-time settlers, could obtain title to the coal rights within the area of their realty holdings.

The Government of British Columbia has passed an Order-in-Council reserving for the people all the unalienated coal lands within the Province. This means that hereafter staking under the Coal and Petroleum Act is forbidden. Hon. T. D. Pattullo, Minister of Lands, explains that it is the definite policy of the Government to put an end to alienation in respect of coal lands as already there are coal bearing areas, to which Crown Grants have been issued, which are being held out of production merely for speculation. He adds that it is proposed that use is to be the basis of all British Columbia alienation policies. This is taken to mean, in the case of coal for instance, that no part of the public domain may be taken up by individuals or corporations unless satisfactory guarantees are forthcoming that it is their intention to take immediate steps to make it productive.

The Jingle Pot Mine, B.C. Coal Mines Ltd., which property is situated near Nanaimo, B.C., has closed down after having been in operation since 1907. Although the area of coal bearing land controlled by the Company was small—only 71 acres—approximately 800,000 tons of coal were taken from the Mine during the twelve years, or an average of about 11,266 tons per acre. The highest daily production was attained in the year 1912 when the day's output averaged 525 tons. The somewhat odd name "Jingle Pot" is said to have been derived by a unique method introduced when the mine opened up for underground signalling. An ordinary iron pot was hung up inverted, a piece of railroad steel being suspended and used as a bell clapper. From the jingling sound which this device made sprung the mine's name.

BOOK REVIEW.

A HANDBOOK FOR NEW CANADIANS

In the lumber camps, in the vicinity of steel works, and at coal and metalliferous mines in Canada, there has for a number of years been proceeding an unostentatious but worthy work, now called the Frontier College, but formerly and perhaps better known as the Reading Camp Association, under Mr. Alfred Fitzpatrick, which has for its object the Canadianizing of the newly arrived immigrant, so that he may become a help to this country and not a disturbing and unsettling force. The writer, during his connection with the coal and steel companies of Nova Scotia, had occasion to come into personal contact with the endeavours of Mr. Fitzpatrick and his associate, and desires to bear testimony to the impression then gained that this work was pursued with such excellent and pure motives, and such good results; under such conditions of personal sacrifice and absence of gain, as to be a source of refreshment and almost of wonder to observers. The instructors of the Reading Camp Association merely asked for employers of labour the permission to erect a tent or frame building in which to hold the classes, and, after working themselves as day labourers and thereby supporting themselves, these instructors would spend their evenings teaching to foreigners the rudiments of English and the principles of our Canadian citizenship and popular government.

Mr. Fitzpatrick has now published a volume designed as a primer for newly arrived Canadians. This primer is drawn up from full personal experience of the outlook of the average immigrant from Continental Europe. As Mr. Fitzpatrick says in his preface: "The immigrant finds himself in the midst of new conditions. He lacks the language and everything combines to make him the prey of unfavourable circumstances. Even the better informed of his own race, already in Canada, are sometimes ready to take advantage of him. Particularly does this apply to the masses of unskilled labourers."

Mr. Fitzpatrick's reference to the exploitation of newly arrived foreigners by his own countrymen in Canada is not strained. They are oftentimes the very worst foes of the newly arrived immigrant, who are rack-rented and overcharged for supplies in a shameless manner. Usually the gentlemen who thus take advantage of their knowledge of the immigrant's language combine the illicit sale of bad liquor with their other commercial enterprises, as all residents of mining camps will bear witness.

The "Handbook for New Canadians" contains practical information about Canada, about employment and modes of payment, banks, remittances of money, schools, the police, the seasons, birds, animals, and many other things that are all new to the immigrant. Information is given about our geography, our form of government, and Canadian history. A specially valuable chapter is that on naturalization, which the book urges should be regarded as a prize to be striven for, and as a badge of honour to the new Canadian. A vocabulary of common words in parallel columns of Italian, French, Swedish, Ruthenian and Yiddish is given compared with the corresponding English word idiom. The book is a real text-book of Canadianism, and employers will be helping along

a good work, and materially assisting themselves by giving it circulation among their foreign employees, and by also giving to the Frontier College the small assistance that it asks.

Ed.

MINING INSTITUTE MEETING WILL BE BEST EVER.

At the meeting of the Toronto branch of the Canadian Mining Institute on Saturday Feb. 21 further progress on preparations for the Annual Meeting March 8—10 was reported. Dr. W. G. Miller, who presided at the meeting in the absence of Mr. C. E. Smith, stated that he had seen most of the papers that are to be presented and that he believed them to be of high order and that they would make the technical sessions very interesting. Mr. C. W. Knight, secretary of the meeting committee announced that arrangements have been made to have special cars, pullman and diner for the trip to the International Nickel Refinery at Port Colborne on Thursday. It is expected that many will wish to take this trip and those doing so should advise the excursion committee, of which Dr. T. L. Walker is chairman, early. The Smoker and Concert on Tuesday evening is to be one of the rousing old time parties, with Col. J. J. Penhale and Mr. G. G. L. Lindsey in charge. Those wishing to attend should advise Assistant Secretary Rose on the first day of the meeting so that arrangements can be made to seat everyone. Those who wish to attend the Dinner on Wednesday evening should notify Mr. Rose not later than Tuesday.

Two of Ontario's biggest mines will receive attention at the meeting. On Monday evening the mining and melting operations of the International Nickel Company of Canada will be described by, E. A. Collins presenting a paper written by members of the staff. On Wednesday afternoon, H. Park, superintendent of the Nipissing, will describe Ontario's most successful silver mine.

Recent developments in Manitoba and some of the problems to be solved will be indicated by Dr. R. C. Wallace, Mining Commissioner of Northern Manitoba, in a paper to be presented Monday evening.

The afternoon session on Monday will be specially interesting to those in the iron and steel industry. On Tuesday morning coal will be the chief topic and in the afternoon oil and gas. The Wednesday sessions will be devoted chiefly to metals and asbestos.

The Ladies' Committee has arranged a program for entertaining visiting ladies. Tea will be served at Mrs. J. B. Tyrrell's on Monday and at the Art Museum on Tuesday afternoon. On Tuesday evening there will be bridge at Mrs. R. F. Segsworth's. Mrs. D. A. Dunlop, Mrs. James McEvoy, Mrs. J. P. MacGregor, Mrs. W. A. Parks, Mrs. R. F. Segsworth and Mrs. J. B. Tyrrell form the committee.

The splendid program arranged for the meeting and the excursion on Thursday should bring a record attendance.

The announcement was made in Toronto this week that the Department of Mines had authorized the closing of the Recorder's Office for the Larder Lake Mining Division, which has been located at Matheson. The present branch office at Swastika is made the head office for the Division, and George Ginn, formerly Assistant Recorder at Swastika is appointed Recorder. One of the requests made of the Cabinet when Premier Drury and his colleagues visited Northern Ontario in December last was that the Swastika Division be extended. This has now been brought about by the closing of the Matheson office.

METAL QUOTATIONS.

Fair prices for ingot at Montreal 24th February.

	Cents per lb.
Electro Copper	24½
Casting Copper	24
Lead	12
Tin	77
Zinc	12¼
Antimony	13½
Aluminum	34

PREPARING FOR THE CANADIAN MINING INSTITUTE MEETING.

Additional features announced for Meeting.

In addition to the various features of the annual meeting of the Canadian Mining Institute to be held in the King Edward Hotel, Toronto, on March 8, 9 and 10, as previously announced, the local committee has arranged for a trip to the International Nickel Company's plant at Port Colborne. Special pullman and dining cars will be attached to the train. The Good-year Tire Company's factory will also be visited while the members are in Toronto. H. Parks will give a lantern talk on the Nipissing Mine. Tuesday evening there will be a vaudeville show at the King Edward Hotel for the entertainment of the members and a number of good speakers have been secured for the annual dinner on Wednesday evening. All indications point to the most successful annual convention the Institute has yet held and the prospects are that the attendance will be a record one. One of the items for the first day will be an address by J. A. Campbell M. P. on the attitude of the Government towards mining development.

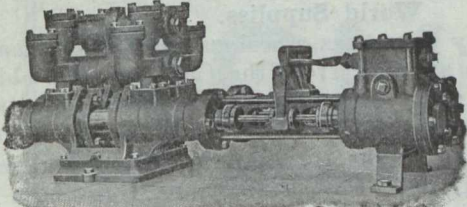
ASSOCIATED GOLDFIELDS.

At the head office of Associated Goldfields, the company which is developing a large orebody at Larder Lake, Ontario, news has just been given out of important developments. Mr. A. J. Moore, the consulting engineer, has reported the finding of a large body of \$12 ore. The company has previously been counting on a large tonnage of comparatively low grade material. Plans are now being made for the development of the richer ore.

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STATUS OF THE ENGINEER

At the meeting of the Toronto branch of the Canadian Mining Institute on Saturday Feb. 21, the chief topic of discussion was the proposed engineering bill. A committee of the Engineering Institute of Canada has been industriously working on the problem of improving the status of the profession, and during the past year there have been many conferences at which there were representatives of the Toronto branch of the Canadian Mining Institute. It is proposed to bring up the subject at the annual meeting of the Institute and Mr. James McEvoy has been asked to introduce the discussion on Monday morning, March 8th. At the meeting of the Toronto branch last Saturday, attention was directed to some objectionable features of the proposed bill. The objections were stated in a communication from the Sudbury branch Mr. J. P. McGregor, secretary of the Toronto branch read the communication and his reply.

It will probably be admitted by most engineers that some legislation to protect the men of their profession and the public is desirable. A few engineers have interested themselves seriously in this matter and after much deliberation are making proposals as to what should be done. It is now up to all Canadian engineers to consider whether these proposals would, if carried out, be in the public interest. The comparatively few engineers who have been active in this matter should be advised whether their views are fairly representative or not. It is not sufficient to thank them for their work without offering helpful suggestions. The proposals are up for discussion and should be criticized now, not after they have been put into effect.

It is well known that many unqualified men have posed as engineers in order to obtain some remuneration that would otherwise have been denied them. Such practice might conceivably be prevented by legislation. In applying for such legislation, however, it is quite possible that mistakes will be made. A simple bill framed to protect the public would meet with general approval, but such framing appears to be not easy. Most proposals made have objectionable features that are partly the result of an endeavor to be too specific. Proposals made by one group of engineers and considered very favorably by many are quite objectionable to another group. Apparently however, many of the objections have been met satisfactorily and the committee's work may soon result in proposals that will meet with general approval. It is now fairly well understood that the proposed legislation should not provide for any special privileges for engineers. It should provide for registration of engineers so that the public will know whom they are employing, but it should not prevent anyone else from doing the work if the employers are satisfied.

The Engineering Institute of Canada is not as a body applying for legislation for engineers. A bill drawn by a committee of that Institute has been given some publicity, but it is understood that application for legislation will be left solely with the engineers in each province. The Council of the Canadian Mining Institute has requested the various branches to consider the proposed legislation and to submit their reports to Council.

Some time ago it was agreed by the Engineering Institute of Canada that there would be no application for legislation by that body until the bill as affecting mining had been approved by the Canadian

Mining Institute. This agreement is of no consequence under the present circumstances however, as the intention is to leave the application to engineers in the several provinces. There being no provincial organization in the Mining Institute it will not be an easy matter to get the opinion of the mining engineers in any province, and it is quite possible that an inadequately considered bill may be submitted to the legislature.—R.E.H.

IMPERIAL INSTITUTE TO ISSUE MONOGRAPHS ON MINERAL RESOURCES OF THE EMPIRE.

The Mineral Resources Committee of the Imperial Institute, of which Viscount Harcourt has succeeded the late Viscount Rhondda as chairman, has arranged for the issue of a series of Monographs on the Mineral Resources of the Empire, of which one on zinc ores has already appeared. Others on manganese ores and tin ores are now being published by Mr. J. Murray. The Monograph on manganese ores has been prepared under the direction of the Committee by A. H. Curtis, B.A., F.G.S., and that on tin ores by G. Davies, M.Sc. (Lond), F.G.S., of the staff of the Imperial Institute. In each case the book is arranged in three chapters.

The first gives a brief survey of the occurrences of the ores and of the characters and uses of the metals. The second chapter deals fully with the sources of the supply within the Empire, and the third describes shortly the deposits in foreign countries. The Monographs conclude with a bibliography of the principal publications of the subjects dealt with. The Monographs are published at 3s. 6d. net. Owing to its extensive employment in the manufacture of iron and steel, manganese was in great demand during the war.

World Supplies.

Unfortunately there was a serious shortage of manganese ores, as supplies from the Caucasus, the chief producer, was shut off, and shipping facilities restricted the amount available from India, which ranked second to Russia as a producer of manganese ores. At the present time the output from India is increasing, and Brazil has enormously enlarged its production, but in view of the disturbed conditions still prevailing in Russia, there is likely to be a continued shortage of the ore there for some time to come, particularly of the higher grades now required by metallurgists and in chemical industries. Several additional sources are indicated as possible contributors to the world's supply in the future.

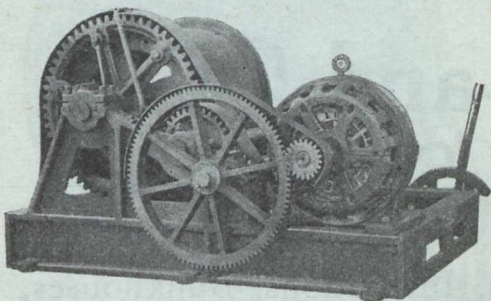
The Empire is favorably situated as regards supplies of tin ore, and at the present time between 50 and 60 per cent of the world's output is obtained from British countries. Moreover, it holds a controlling influence in the industry of tin smelting and refining.

Federated States' Output.

The Federated Malay States is the most important tin producing area in the world, and most of its output, together with ore from Siam, the Dutch East Indies, South Africa and other countries, is smelted in the Straits Settlements. Bolivia and the Dutch East Indies are the chief foreign producers of tin ore. Owing to the war the German tin smelting industry has practically ceased, and another result of the war has been the establishment of a tin smelting industry in the United States, which country consumes 40 per cent, or more, of the world's output of tin.

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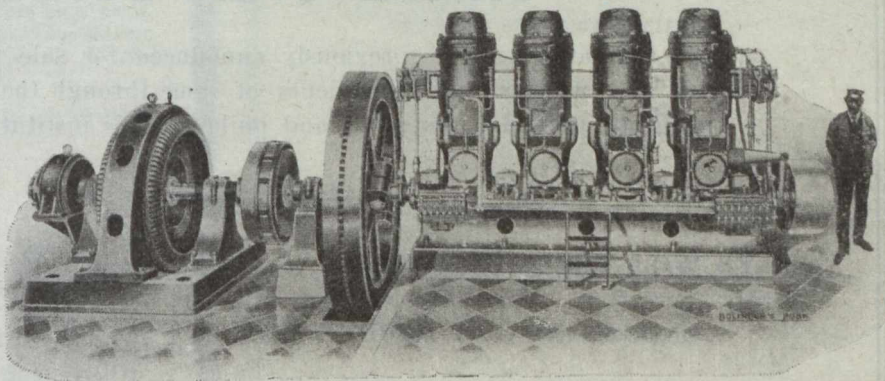
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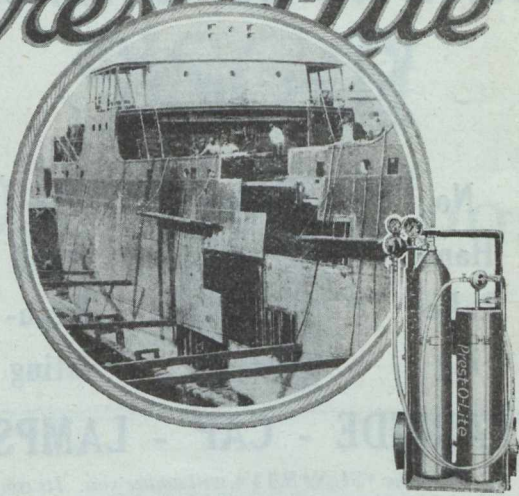
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Booth Building, OTTAWA

February, 1920

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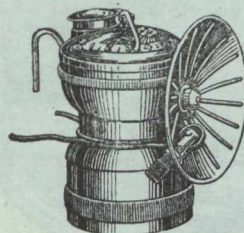
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Glace Bay

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19 Collieries

Output—5,000,000 tons annually

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Screened, run of mine and slack

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Screened, run of mine and slack

Collieries at Glace Bay, C.B., and Springhill, N.S.

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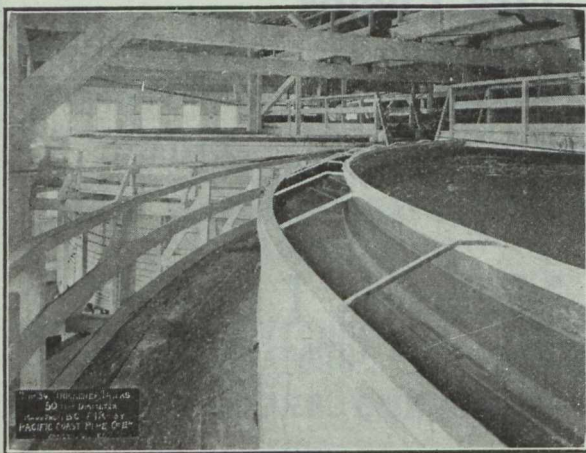
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Canadian Fairbanks-Morse.
- A.C. Units:**
MacGovern & Co.
- Agitators:**
The Dorr Co.
- Air Hoists:**
Canadian Ingersoll-Rand Co., Ltd.
Mussens, Limited.
- Alloy and Carbon Tool Steel:**
H. A. Drury Co., Ltd.
International High Speed Steel Co., Rockaway, N.J.
- Alternators:**
MacGovern & Co.
Spielman Agencies, Regd.
- Aluminium:**
- Amalgamators:**
Northern Canada Supply Co.
Mine and Smelter Supply Co.
Wabi Iron Works.
- Antimony:**
Canada Metal Co.
- Antimonial Lead:**
Pennsylvania Smelting Co.
- Arrester, Locomotive Spark:**
Hendrick Manufacturing Co.
- Arsenic White Lead:**
Coniagas Reduction Co.
- Assayers' and Chemists' Supplies:**
Dominion Engineering & Inspection Co.
Lymans, Limited
Mine & Smelter Supply Co.
Pennsylvania Smelting Co.
Stanley, W. F. & Co., Ltd.
- Ashes Handling Machinery:**
Canadian Mead-Morrison Co., Limited
- Assayers and Chemists:**
Milton L. Hersey Co., Ltd.
Campbell & Deyell
Ledoux & Co.
Thos. Heys & Son
C. L. Constant Co.
- Asbestos:**
Everitt & Co.
- Balls:**
Canadian Foundries and Forgings, Ltd.
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works.
The Hardinge Conical Mill Co.
- Ball Mills:**
Hardinge Conical Mill Co.
Hull Iron & Steel Foundries, Ltd.
Mine and Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works.
- Balances—Heusser:**
Canadian Fairbanks-Morse Co., Ltd.
Mine and Smelter Supply Co.
- Babbit Metals:**
Canada Metal Co.
Canadian Fairbanks-Morse Co., Ltd.
Hoyt Metal Co.
- Ball Mill Feeders:**
Fraser & Chalmers of Canada, Ltd.
Hardinge Conical Mill Co.
Hull Iron & Steel Foundries, Ltd.
- Ball Mill Linings:**
Hardinge Conical Mill Co.
Hull Iron & Steel Foundries, Ltd.
- Belting—Leather, Rubber and Cotton:**
Canadian Fairbanks-Morse Co., Ltd.
Link Belt Co.
The Mine & Smelter Supply Co.
Northern Canada Supply Co.
Jones & Glasco.
- Belting:**
R. T. Gilman & Co.
- Belting (Transmission):**
Goodyear Tire & Rubber Co.
- Belting (Elevator):**
Goodyear Tire & Rubber Co.
- Belting (Conveyor):**
Goodyear Tire & Rubber Co.
- Blasting Batteries and Supplies:**
Canadian Ingersoll-Rand Co., Ltd.
Mussens, Ltd.
Northern Canada Supply Co.
Canadian Explosives, Ltd.
- Bluestone:**
The Consolidated Mining & Smelting Co.
- Blowers:**
Canadian Fairbanks-Morse Co., Ltd.
MacGovern & Co., Inc.
Northern Canada Supply Co.
Fraser & Chalmers of Canada, Ltd.
- Boilers:**
Northern Canada Supply Co.
Canadian Ingersoll-Rand Co., Ltd.
Marsh Engineering Works
MacGovern & Co., Inc.
R. T. Gilman & Co.
Fraser & Chalmers of Canada, Ltd.
The John Inglis Company
Wabi Iron Works.
- Blue Vitriol (Coniagas Red):**
Canadian Fairbanks-Morse Co., Ltd.
- Bortz and Carbons:**
Diamond Drill Carbon Co.
- Boxes, Cable Junction:**
Standard Underground Cable Co. of Canada, Ltd.
Northern Electric Co., Ltd.
- Brazilian Rough Diamonds:**
Diamond Drill Carbon Co.
- Brazilian Mica:**
Diamond Drill Carbon Co.
- Buggies, Mine Car (Steel)**
Hendrick Manufacturing Co.
- Brazilian Ballas:**
Diamond Drill Carbon Co.
- Brazilian Rock Crystal:**
Diamond Drill Carbon Co.
- Brazilian Tourmalines:**
Diamond Drill Carbon Co.
- Brazilian Aquamarines:**
Diamond Drill Carbon Co.
- Bridges—Man Trolley and Rope Operated—Material Handling:**
Canadian Mead-Morrison Co., Limited
- Bronze, Manganese, Perforated and Plain:**
Hendrick Manufacturing Co.
- Buckets:**
Canadian Ingersoll-Rand Co., Ltd.
Canadian Mead-Morrison Co., Limited
The Electric Steel & Metals Co.
R. T. Gilman & Co.
Hendrick Manufacturing Co.
Link-Belt Co.
Marsh Engineering Works
Mussens, Ltd.
MacKinnon Steel Co., Ltd.
Northern Canada Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works
- Buckets, Elevator:**
Hendrick Mfg. Co.
- Cable—Aerial and Underground:**
Northern Canada Supply Co.
Standard Underground Cable Co. of Canada, Ltd.
- Cableways:**
Canadian Mead-Morrison Co., Limited
Fraser & Chalmers of Canada, Ltd.
Mussens, Ltd.
The Wabi Iron Works
R. T. Gilman & Co.
- Cages:**
Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.
Northern Canada Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Mine & Smelter Supply Co.
Mussens, Ltd.
The Wabi Iron Works

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Smelters and Refiners of Cobalt Ores

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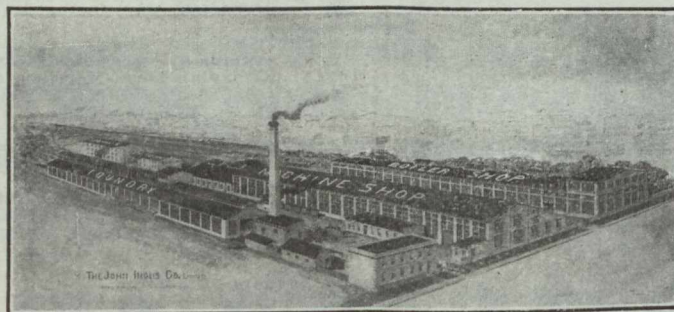
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- Cables—Wire:**
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Canada Wire & Cable Co.
Fraser & Chalmers of Canada, Ltd.
Northern Electric Co., Ltd.
Osborn, Sam'l (Canada) Limited.
R. T. Gilman & Co.
- Cable Railway Systems:**
Canadian Mead-Morrison Co., Limited.
- Cam Shafts:**
Canada Foundries & Forgings, Ltd.
Hull Iron & Steel Foundries, Ltd.
- Car Dumps:**
Sullivan Machinery Co.
R. T. Gilman & Co.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
- Carbide of Calcium:**
Canada Carbide Company, Ltd.
- Cars:**
Canadian Foundries and Forgings, Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
John J. Gartshore
MacKinnon Steel Co., Ltd.
The Electric Steel & Metals Co.
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.
Marsh Engineering Works
Mine and Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
R. T. Gilman & Co.
The Wabi Iron Works
- Car Wheels and Axles:**
Canadian Car Foundry Co., Ltd.
Burnett & Crampton
Hull Iron & Steel Foundries, Ltd.
John J. Gartshore
Marsh Engineering Works, Ltd.
Osborn, Sam'l (Canada) Limited.
The Electric Steel & Metals Co.
The Wabi Iron Works
- Carriers (Gravity):**
Jones & Glassco
- Castings—Brass**
The Canada Metal Co., Ltd.
- Castings (Iron and Steel)**
Burnett & Crampton
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
Osborn, Sam'l (Canada) Limited.
The Electric Steel & Metals Co.
The Wabi Iron Works
- Cement and Concrete Waterproofing:**
Spielman Agencies, Regd.
- Cement Machinery:**
Northern Canada Supply Co.
Hadfields, Limited
Hull Iron & Steel Foundries, Ltd.
Osborn, Sam'l (Canada) Limited.
Fraser & Chalmers of Canada, Ltd.
Canadian Fairbanks-Morse Co., Ltd.
The Electric Steel & Metals Co.
R. T. Gilman & Co.
Burnett & Crampton
- Chains:**
Jones & Glassco
Northern Canada Supply Co.
Canadian Fairbanks-Morse Co., Ltd.
Link-Belt Co.
Greening, B., Wire Co., Ltd.
- Chain Drives:**
Jones & Glassco
- Chemical Apparatus:**
Mine and Smelter Supply Co.
- Chemists:**
Canadian Laboratories
Campbell & Deyell
Thos. Heyes & Sons
Milton Hersey Co.
Ledoux & Co.
Constant, C. L. Company
- Chrome Ore:**
The Electric Steel & Metals Co.
Everett & Co.
- Classifiers:**
Mine and Smelter Supply Co.
Mussens, Limited
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works
R. T. Gilman & Co.
The Dorr Company
- Coal:**
Dominion Coal Co.
Nova Scotia Steel & Coal Co.
- Coal Cutters:**
Osborn, Sam'l (Canada) Limited.
Sullivan Machinery Co.
Canadian Ingersoll-Rand Co., Ltd.
- Coal Crushers:**
Canadian Mead-Morrison Co., Limited
- Coal Mining Explosives:**
Canadian Explosives, Ltd.
- Coal Mining Machinery:**
Osborn, Sam'l (Canada) Limited.
Canadian Ingersoll-Rand Co., Ltd.
Sullivan Machinery Co.
- Marsh Engineering Works
Hadfields, Ltd.
Hendrick Mfg. Co.
Fraser & Chalmers of Canada, Limited
Mussens, Limited
R. T. Gilman & Co.
- Coal and Coke Handling Machinery**
Canadian Mead-Morrison Co., Limited.
Link-Belt Co.
- Coal Pockets:**
Canadian Mead-Morrison Co., Limited.
- Coal Pick Machines:**
Sullivan Machinery Co.
- Coal Screening Plants:**
Canadian Mead-Morrison Co., Limited.
- Cobalt Oxide:**
Coniagas Reduction Co.
Everitt & Co.
- Compressors—Air:**
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Canadian Ingersoll-Rand Co., Ltd.
Northern Canada Supply Co.
MacGovern & Co., Inc.
R. T. Gilman & Co.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
The Mine & Smelter Supply Co.
- Concrete Mixers:**
Canadian Fairbanks-Morse Co., Ltd.
Northern Canada Supply Co.
Gould, Shapley & Muir Co., Ltd.
MacGovern & Co., Inc.
Mussens, Limited
R. T. Gilman & Co.
- Condensers:**
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Northern Canada Supply Co.
MacGovern & Co., Inc.
- Concentrating Tables:**
The Mine & Smelter Supply Co.
Deister Concentrator Co.
The Wabi Iron Works
- Converters:**
Northern Canada Supply Co.
MacGovern & Co., Inc.
- Conveyors—McCastin Gravity Bucket:**
Canadian Mead-Morrison Co., Limited.
- Contractors' Supplies:**
Canadian Fairbanks-Morse Co., Ltd.
- Consulters and Engineers:**
Hersey Milton Co., Ltd.
- Conveyors:**
The Mine & Smelter Supply Co.
- Conveyor Flights:**
Hendrick Mfg. Co., Ltd.
- Conveyor—Trough—Belt:**
Canadian Fairbanks-Morse Co., Ltd.
Link-Belt Co.
Hendrick Mfg. Co.
Mussens, Limited
Jones & Glassco (Roller, Belt and Chain)
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The Wabi Iron Works
- Conical Mills:**
Hardinge Conical Mill Co.
- Copper:**
The Canada Metal Co., Ltd.
Consolidated Mining & Smelting Co.
- Cranes:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
Link-Belt Co.
R. T. Gilman & Co.
Smart-Turner Machine Co.
- Crane Ropes:**
Allan Whyte & Co.
Greening, B., Wire Co., Ltd.
- Crucibles:**
Canadian Fairbanks-Morse Co., Ltd.
The Mine & Smelter Supply Co.
- Crusher Balls:**
Canada Foundries & Forgings, Ltd.
Hull Iron & Steel Foundries, Limited, Hull, Que.
Osborn, Sam'l (Canada) Limited.
- Crude Oil Engines:**
Swedish Steel & Importing Co., Ltd.
- Crushers:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
Hardinge Conical Mill Co.
Osborn, Sam'l (Canada) Limited.
The Electric Steel & Metals Co., Ltd.
R. T. Gilman & Co.
Lymans, Ltd.
Mussens, Limited
The Mine & Smelter Supply Co.
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TORONTO, Ontario

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Cyanide Plant Equipment:

The Dorr Co.
The Mine & Smelter Supply Co.

D. C. Units:

MacGovern Co.

Derricks:

Smart-Turner Machine Co.
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
R. T. Gilman & Co.
Canadian Fairbanks-Morse Co., Ltd.
Mussens, Limited

Diamond Drill Contractors:

Diamond Drill Contracting Co.
E. J. Longyear Company
Smith & Travers
Sullivan Machinery Co.

Diamond Tools:

Diamond Drill Carbon Co.

Diamond Importers:

Diamond Drill Carbon Co.

Digesters:

Canadian Chicago Bridge and Iron Works

Dies:

Canada Foundries & Forgings, Ltd.
Hull Iron & Steel Foundries, Ltd.

Dredger Pins:

Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
The Electric Steel & Metals Co.
Hadfields, Limited

Dredging Machinery:

Canadian Steel Foundries, Ltd.
Canadian Mead-Morrison Co., Limited.
Hadfields, Limited
Hull Iron & Steel Foundries, Ltd.
R. T. Gilman & Co.

Dredging Ropes:

Allan, Whyte & Co.
Greening, B., Wire Co., Ltd.
R. T. Gilman & Co.

Drills, Air and Hammer:

Canadian Ingersoll-Rand Co., Ltd.
Sullivan Machinery Co.
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.
Canadian Rock Drill Co.
The Mine & Smelter Supply Co.
Mussens, Limited

Drills—Core:

Canadian Ingersoll-Rand Co., Ltd.
E. J. Longyear Company
Standard Diamond Drill Co.
Sullivan Machinery Co.

Drills—Diamond:

Sullivan Machinery Co.
Northern Canada Supply Co.
E. J. Longyear Company

Drill Steel—Mining:

H. A. Drury Co., Ltd.
Hadfields, Limited
International High Speed Steel Co., Rockaway, N.J.
Osborn, Sam'l (Canada) Limited.
Mussens, Limited
Swedish Steel & Importing Co., Ltd.

Drill Steel Sharpeners:

Canadian Ingersoll-Rand Co., Ltd.
Northern Canada Supply Co.
Sullivan Machinery Co.
Osborn, Sam'l (Canada) Limited.
Canadian Rock Drill Co.
The Wabi Iron Works

Drills—Electric:

Canadian Fairbanks-Morse Co., Ltd.
Sullivan Machinery Co.
Northern Electric Co., Ltd.

Drills—High Speed and Carbon:

Canadian Fairbanks-Morse Co., Ltd.
Osborn, Sam'l (Canada) Limited.
H. A. Drury Co., Ltd.
Hadfields, Limited

Dynamite:

Canadian Explosives
Northern Canada Supply Co.

Dynamos:

Canadian Fairbanks-Morse Co., Ltd.
MacGovern & Company

Ejectors:

Canadian Fairbanks-Morse Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Northern Canada Supply Co.

Elevators:

Canadian Mead-Morrison Co., Limited.
Sullivan Machinery Co.
Northern Canada Supply Co.
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
The Wabi Iron Works

Engineering Instruments:

C. L. Berger & Sons

Engines—Automatic:

Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
Fraser & Chalmers of Canada, Ltd.

Engines—Gas and Gasoline:

Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
Alex. Fleck
Fraser & Chalmers of Canada, Ltd.
Osborn, Sam'l (Canada) Limited.
Sullivan Machinery Co.
Gould, Shapley & Muir Co., Ltd.
MacGovern & Co., Inc.
The Mine & Smelter Supply Co.

Engines—Haulage:

Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
Fraser & Chalmers of Canada, Ltd.

Engines—Marine:

Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
MacGovern & Co., Inc.
Swedish Steel & Importing Co., Ltd.

Engines—Steam:

Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
R. T. Gilman & Co.
MacGovern & Co., Inc.
Fraser & Chalmers of Canada, Ltd.

Engines—Stationary:

Swedish Steel & Importing Co., Ltd.

Engineers:

The Dorr Co.

Ferro-Alloys (all Classes):

Everitt & Co.

Feed Water Heaters:

MacGovern & Co.

Flashlights—Electric:

Spielman Agencies, Regd.

Flood Lamps:

Northern Electric Co., Ltd.

Flourspar:

The Consolidated Mining & Smelting Co.
Everitt & Co.

Forges:

Canadian Fairbanks-Morse Co., Ltd.
Northern Canada Supply Co.

Forging:

Canadian Mead-Morrison Co., Limited.
Canadian Foundries and Forgings, Ltd.
Hull Iron & Steel Foundries, Ltd.
Smart-Turner Machine Co.
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd.

Frogs:

Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
John J. Gartshore

Frequency Changers:

MacGovern & Co., Inc.

Furnaces—Assay:

Canadian Fairbanks-Morse Co., Ltd.
Lymans, Limited
Mine & Smelter Supply Co.

Fuse:

Canadian Explosives
Northern Canada Supply Co.

Gears (Cast):

Hull Iron & Steel Foundries, Ltd.
The Link-Belt Co.

Gears, Machine-Cut:

Canadian Fairbanks-Morse Co., Ltd.
Canadian Steel Foundries, Ltd.
The Electric Steel & Metals Co.
The Hamilton Gear & Machine Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Granulators:

Hardinge Conical Mill Co.

Grinding Wheels:

Canadian Fairbanks-Morse Co., Ltd.

Gold Refiners

Goldsmith Bros.

Canadian Miners' Buying Directory.—(Continued)

- Gold Trays:**
Canada Chicago Bridge & Iron Works
- Hose (Air Drill):**
Goodyear Tire & Rubber Co.
- Hose (Fire):**
Goodyear Tire & Rubber Co.
- Hose (Packings)**
Goodyear Tire & Rubber Co.
- Hose (Suction):**
Goodyear Tire & Rubber Co.
- Hose (Steam):**
Goodyear Tire & Rubber Co.
- Hose (Water):**
Goodyear Tire & Rubber Co.
- Hammer Rock Drills:**
Osborn, Sam'l (Canada) Limited.
Mussens, Limited
The Mine & Smelter Supply Co.
- Hangers and Cable:**
Standard Underground Cable Co. of Canada, Ltd.
- High Speed Steel:**
Canadian Fairbanks-Morse Co. Ltd.
H. A. Drury Co., Ltd.
Osborn, Sam'l (Canada) Limited.
Hadfields, Limited
International High Speed Steel Co., Rockaway, N.J.
- High Speed Steel Twist Drills:**
Canadian Fairbanks-Morse Co., Ltd.
H. A. Drury Co., Ltd.
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.
- Hoists—Air, Electric and Steam:**
Canadian Ingersoll-Rand Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Jones & Glasco
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
Northern Canada Supply Co.
Mine & Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works.
R. T. Gilman & Co.
Mussens, Limited
Link-Belt Co.
- Hoisting Engines:**
Canadian Fairbanks-Morse Co., Ltd.
The Electric Steel & Metals Co.
Mussens, Limited
Sullivan Machinery Co.
Canadian Ingersoll-Rand Co., Ltd.
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
Fraser & Chalmers of Canada, Ltd.
The Mine & Smelter Supply Co.
- Hoisting Towers:**
Canadian Mead-Morrison Co., Limited.
- Hose:**
Canadian Fairbanks-Morse Co., Ltd.
Northern Canada Supply Co.
- Hydraulic Machinery:**
Canadian Fairbanks-Morse Co., Ltd.
Hadfields, Limited
MacGovern & Co., Inc.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works
- Industrial Chemists:**
Hersey, M. & Co., Ltd.
- Ingot Copper:**
Canada Metal Co., Ltd.
Hoyt Metal Co.
- Insulating Compounds:**
Standard Underground Cable Co. of Canada, Ltd.
- Inspection and Testing:**
Dominion Engineering & Inspection Co.
- Inspectors:**
Hersey, M. & Co., Ltd.
- Jacks:**
Canadian Fairbanks-Morse Co., Ltd.
Can. Brakeshoe Co., Ltd.
Northern Canada Supply Co.
R. T. Gilman & Co.
Mussens, Limited
- Jack Screws:**
Canadian Foundries and Forgings, Ltd.
- Laboratory Machinery:**
Mine & Smelter Supply Co.
- Lamps—Acetylene:**
Dewar Manufacturing Co., Inc.
- Lamps—Carbide:**
Dewar Manufacturing Co., Inc.
- Lamps—Miners:**
Canada Carbide Company, Limited
Canadian Fairbanks-Morse Co., Ltd.
Dewar Manufacturing Co., Inc.
Northern Electric Co., Ltd.
Mussens, Limited
- Lamps:**
Dewar Manufacturing Co., Inc.
- Lanterns—Electric:**
Spielman Agencies, Regd.
- Lead (Pig):**
The Canada Metal Co., Ltd.
Consolidated Mining & Smelting Co.
- Levels:**
C. L. Berger & Sons
- Locomotives (Steam, Compressed Air and Storage Steam):**
Canadian Fairbanks-Morse Co., Ltd.
H. K. Porter Company
R. T. Gilman & Co.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
- Link Belt**
Canadian Fairbanks-Morse Co. Ltd.
Northern Canada Supply Co.
Jones & Glasco
- Machinists:**
Burnett & Crampton
- Machinery—Repair Shop:**
Canadian Fairbanks-Morse Co., Ltd.
- Machine Shop Supplies:**
Canadian Fairbanks-Morse Co., Ltd.
- Magnesium Metal:**
Everitt & Co.
Hull Iron & Steel Foundries, Ltd.
- Manganese Steel:**
Canadian Steel Foundries, Ltd.
The Electric Steel & Metals Co.
Hadfields, Limited
Osborn, Sam'l (Canada) Limited.
Hull Iron & Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works
- Metal Marking Machinery:**
Canadian Fairbanks-Morse Co., Ltd.
- Metal Merchants:**
Henry Bath & Son
Geo. G. Blackwell, Sons & Co.
Coniagas Reduction Co.
Consolidated Mining & Smelting Co. of Canada
Canada Metal Co.
C. L. Constant Co.
Everitt & Co.
- Metallurgical Engineers:**
The Dorr Co.
- Metallurgical Machinery:**
The Dorr Co.
The Mine & Smelter Supply Co.
- Metal Work, Heavy Plates:**
Canada Chicago Bridge & Iron Works
- Mica:**
Everitt & Co.
Diamond Drill Carbon Co.
- Mining Engineers:**
Hersey, M. Co., Ltd.
- Mining Drill Steel:**
H. A. Drury Co., Ltd.
Osborn, Sam'l (Canada) Limited.
International High Speed Steel Co., Rockaway, N.J.
- Mining Requisites:**
Canadian Steel Foundries, Ltd.
Dominion Wire Rope Co., Ltd.
Hadfields, Limited
Osborn, Sam'l (Canada) Limited.
Hull Iron & Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works
- Mining Ropes:**
Dominion Wire Rope Co., Ltd.
- Mine Surveying Instruments:**
C. L. Berger & Sons
- Molybdenite:**
Everitt & Co.
- Monel Metal:**
International Nickel Co.
- Motors:**
Canadian Fairbanks-Morse Co., Ltd.
R. T. Gilman & Co.
MacGovern & Co.
The Mine & Smelter Supply Co.
The Wabi Iron Works

Canadian Miners' Buying Directory.—(Continued)

Motor Generator Sets—A.C. and D.C.
MacGovern & Co.

Nails:
Canada Metal Co.

Nickel:
International Nickel Co.
Coniagas Reduction Co.
The Mond Nickel Co., Ltd.

Nickel Anodes:
The Mond Nickel Co., Ltd.

Nickel Salts:
The Mond Nickel Co., Ltd.

Nickel Sheets:
The Mond Nickel Co., Ltd.

Nickel Wire:
The Mond Nickel Co., Ltd.

Oil Analysts:
Constant, C. L. Co.

Ore Handling Equipment:
Canadian Mead-Morrison Co., Limited.

Ore Sacks:
Northern Canada Supply Co.

Ore Testing Works:
Ledoux & Co.
Can. Laboratories
Milton Hersey Co.
Campbell & Deyell
Hoyt Metal Co.

Ores and Metals—Buyers and Sellers of:
C. L. Constant Co.
Geo. G. Blackwell
Consolidated Mining and Smelting Co. of Canada
Oxford Copper Co.
Canada Metal Co.
Hoyt Metal Co.
Everitt & Co.
Pennsylvania Smelting Co.

Packing:
Canadian Fairbanks-Morse Co., Ltd.

Paints—Special:
Spielman Agencies, Regd.

Perforated Metals:
Northern Canada Supply Co.
Hendrick Mfg. Co.
Canada Wire and Iron Goods Company.
Greening, B., Wire Co.

Pig Tin:
Canada Metal Co., Ltd.
Hoyt Metal Co.

Pig Lead:
Canada Metal Co., Ltd.
Hoyt Metal Co.
Pennsylvania Manufacturing Co.

Pipes:
Canadian Fairbanks-Morse Co., Ltd.
Canada Metal Co., Ltd.
Consolidated M. & S. Co.
Northern Canada Supply Co.
R. T. Gilman & Co.

Pipe Fittings:
Canadian Fairbanks-Morse Co., Ltd.

Pipe—Wood Stave:
Pacific Coast Pipe Co.
Mine & Smelter Supply Co.

Piston Rock Drills:
Mussens, Limited
Mine & Smelter Supply Co.

Plate Works:
John Inglis Co., Ltd.
Hendrick Mfg. Co.
The Wabi Iron Works
MacKinnon Steel Co., Ltd.

Platinum Refiners:
Goldsmith Bros.

Pneumatic Tools:
Canadian Ingersoll-Rand Co., Ltd.
Jones & Glassco
R. T. Gilman & Co.

Prospecting Mills and Machinery:
The Electric Steel & Metals Co.
E. J. Longyear Company
Standard Diamond Drill Co.
Mine & Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Pumps—Pneumatic:
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Sullivan Machinery Co.

Pumps—Steam:
Canadian Fairbanks-Morse Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
The Electric Steel & Metals Co.
The Mine & Smelter Supply Co.
Mussens, Limited
Northern Canada Supply Co.
Smart-Turner Machine Co.
E. T. Gilman & Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Pumps—Turbine:
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Canadian Ingersoll-Rand Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Pumps—Vacuum:
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
The Wabi Iron Works

Pumps—Valves:
Canadian Fairbanks-Morse Co., Ltd.

Pulleys, Shaftings and Hangings:
Northern Canada Supply Co.
Canadian Fairbanks-Morse Co., Ltd.
The Wabi Iron Works

Pulverizers—Laboratory:
Mine & Smelter Supply Co.
The Wabi Iron Works
Hardinge Conical Mill Co.

Pumps—Boiler Feed:
Smart-Turner Machine Co.
Northern Canada Supply Co.
Canadian Fairbanks-Morse Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
Mine & Smelter Supply Co.

Pumps—Centrifugal:
Canadian Fairbanks-Morse Co., Ltd.
The Electric Steel & Metals Co.
Smart-Turner Machine Co.
Canadian Mead-Morrison Co., Limited.
Canadian Ingersoll-Rand Co., Ltd.
Mine & Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Pumps—Diaphragm
The Dorr Company

Pumps—Electric
Canadian Fairbanks-Morse Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
Smart-Turner Machine Co.

Pumps—Sand and Slime:
Canadian Fairbanks-Morse Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
Mine & Smelter Supply Co.
The Electric Steel & Metals Co.
The Wabi Iron Works
Smart-Turner Machine Co.

Quarrying Machinery:
Sullivan Machinery Co.
Canadian Ingersoll-Rand Co., Ltd.
Hadfields, Limited
Mussens, Limited
R. T. Gilman Co.

Rails:
Hadfields, Limited
John J. Gartshore
R. T. Gilman & Co.
Mussens, Limited

Railway Supplies:
Canadian Fairbanks-Morse Co., Ltd.

Refiners:
Goldsmith Bros.

Riddles:
Hendrick Mfg. Co.

Roofing:
Canadian Fairbanks-Morse Co., Ltd.
Northern Canada Supply Co.

Rope—Manilla:
Osborn, Sam'l (Canada) Limited.
Mussens, Limited

Rope—Manilla and Jute:
Jones & Glassco
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.
Allan, Whyte & Co.

Canadian Miners' Buying Directory.—(Continued)

- Rope—Wire:**
Allan, Whyte & Co.
Dominion Wire Rope Co., Ltd.
Greening, B. Wire Co.
Northern Canada Supply Co.
Mussens, Limited
- Rolls—Crushing**
Canadian Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd.
Hull Iron & Steel Foundries, Ltd.
Osborn, Sam'l (Canada) Limited.
Hadfields, Limited
The Electric Steel & Metals Co.
Mussens, Limited
The Wabi Iron Works
- Samplers:**
Fraser & Chalmers of Canada, Ltd.
C. L. Constant Co.
Ledoux & Co.
Milton Hersey Co.
Thos. Heyes & Son
Mine & Smelter Supply Co.
Mussens, Limited
- Scales—(all kinds):**
Canadian Fairbanks-Morse Co., Ltd.
- Screens:**
Greening, B. Wire Co.
Hendrick Mfg. Co.
Mine & Smelter Supply Co.
Canada Wire and Iron Goods Company.
Link-Belt Co.
- Screens—Cross Patent Flanged Lip:**
Hendrick Mfg. Co.
- Screens—Perforated Metal:**
Hendrick Mfg. Co.
- Screens—Shaking:**
Hendrick Mfg. Co.
- Screens—Revolving:**
Hendrick Mfg. Co.
- Scheelite:**
Everitt & Co.
- Separators:**
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Mine & Smelter Supply Co.
- Shaft Contractors:**
Hendrick Mfg. Co.
- Sheet Metal Work:**
Hendrick Mfg. Co.
- Sheets—Genuine Manganese Bronze:**
Hendrick Mfg. Co.
- Shoes and Dies:**
Canadian Foundries and Forgings, Ltd.
H. A. Drury Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
Hull Iron & Steel Foundries, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works
- Shovels—Steam:**
Canadian Foundries and Forgings, Ltd.
Canadian Mead-Morrison Co., Limited.
Osborn, Sam'l (Canada) Limited.
R. T. Gilman & Co.
- Ship Bunkering Equipment:**
Canadian Mead-Morrison Co., Limited.
- Silene:**
Coniagas Reduction Co.
- Saline Refiners:**
Goldsmith Bros.
- Smelters:**
Goldsmith Bros.
- Sledges:**
Canada Foundries & Forgings, Ltd.
- Smoke Stacks:**
Hendrick Mfg. Co.
MacKinnon Steel Co., Ltd.
Marsh Engineering Works
The Wabi Iron Works
- Special Machinery:**
John Inglis Co., Ltd.
- Spelter:**
The Canada Metal Co., Ltd.
Consolidated Mining & Smelting Co.
- Sprockets:**
Link-Belt Co.
- Spring Coil and Clips Electric:**
Canadian Steel Foundries, Ltd.
- Steel Barrels:**
Smart-Turner Machine Co.
Fraser & Chalmers of Canada, Ltd.
- Stamp Forgings:**
Canada Foundries & Forgings, Ltd.
Hull Iron & Steel Foundries, Ltd.
- Steel Castings:**
Canadian Brakeshoe Co., Ltd.
Canadian Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd.
Osborn, Sam'l (Canada) Limited.
Hull Iron & Steel Foundries, Ltd.
The Electric Steel & Metals Co.
Hadfields, Limited
The Wabi Iron Works
- Steel Drills:**
Canadian Fairbanks-Morse Co., Ltd.
Sullivan Machinery Co.
Northern Canada Supply Co.
The Electric Steel & Metals Co.
Osborn, Sam'l (Canada) Limited.
Canadian Ingersoll-Rand Co., Ltd.
Mussens, Limited
Swedish Steel & Importing Co., Ltd.
- Steel Drums:**
Smart-Turner Machine Co.
- Steel—Tool:**
Canadian Fairbanks-Morse Co., Ltd.
H. A. Drury Co., Ltd.
N. S. Steel & Coal Co.
Osborn, Sam'l (Canada) Limited.
Hadfields, Limited
Swedish Steel & Importing Co., Ltd.
- Structural Steel Work (Light):**
Hendrick Mfg. Co.
- Stone Breakers:**
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
Osborn, Sam'l (Canada) Limited.
Mussens, Limited
R. T. Gilman & Co.
The Wabi Iron Works
- Sulphate of Copper:**
The Mond Nickel Co., Ltd.
Coniagas Reduction Co.
- Sulphate of Nickel:**
The Mond Nickel Co., Ltd.
- Surveying Instruments:**
C. L. Berger
- Switches and Switch Stand:**
Canadian Steel Foundries, Ltd.
Mussens, Limited.
- Switches and Turntables:**
John J. Gartshore
- Tables—Concentrating:**
Mine & Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
- Tanks:**
R. T. Gilman & Co.
- Tanks—Acid:**
Canadian Chicago Bridge & Iron Works
The Mine & Smelter Supply Co.
- Tanks (Wooden):**
Canadian Fairbanks-Morse Co., Ltd.
Gould, Shapley & Muir Co., Ltd.
Pacific Coast Pipe Co., Ltd.
Mine & Smelter Supply Co.
The Wabi Iron Works
- Tanks—Cyanide, Etc.:**
Hendrick Mfg. Co.
Pacific Coast Pipe Co.
MacKinnon Steel Co.
Fraser & Chalmers of Canada, Ltd.
Mine & Smelter Supply Co.
The Wabi Iron Works
- Tanks—Steel:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Canadian Chicago Bridge & Iron Works
Marsh Engineering Works
Osborn, Sam'l (Canada) Limited.
MacKinnon Steel Co.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
Hendrick Mfg. Co.
The Wabi Iron Works
- Tanks—Oil Storage:**
Canadian Chicago Bridge & Iron Works
The Mine & Smelter Supply Co.
- Tanks (water) and Steel Towers:**
Canadian Fairbanks-Morse Co., Ltd.
Canadian Chicago Bridge & Iron Works
Gould, Shapley & Muir Co., Ltd.
MacKinnon Steel Co.
Mine & Smelter Supply Co.
The Wabi Iron Works

Canadian Miners' Buying Directory.—(Continued)

Tramway Points and Crossings:
Canadian Steel Foundries, Ltd.
Hadfields, Limited

Transits:
C. L. Berger & Sons

Transformers:
Canadian Fairbanks-Morse Co., Ltd.
R. T. Gilman & Co.
Northern Electric Co., Ltd.

Transmission Appliances:
Jones & Glassco

Troughs (Conveyor):
Hendrick Manufacturing Co.

Trucks—Electric:
Canadian Fairbanks-Morse Co., Ltd.

Trucks—Hand:
Canadian Fairbanks-Morse Co., Ltd.

Trucks:
Canadian Fairbanks-Morse Co., Ltd.

Tubs:
Hadfields, Limited

Tube Mills:
The Electric Steel & Metals Co.
Fraser & Chalmers of Canada, Ltd.
Hardinge Conical Mill Co.

Tube Mill Balls:
Canada Foundries & Forgings, Ltd.
Fraser & Chalmers of Canada, Ltd.
Hull Iron & Steel Foundries, Ltd.

Tube Mill Liners:
Burnett & Crampton
Fraser & Chalmers of Canada, Ltd.
Hull Iron & Steel Foundries, Ltd.

Turbines—Water Wheel:
MacGovern & Co.

Turbines—Steam:
Fraser & Chalmers of Canada, Ltd.
MacGovern & Co.

Twincones:
Canada Foundries & Forgings, Ltd.

Uranium:
Everitt & Co.

Weighing Larries:
Canadian Mead-Morrison Co., Limited.

Welding—Rod and Flux:
Prest-O-Lite Co. of Canada, Ltd.
Imperial Brass Mfg. Co.

Welding and Cutting—Oxy-Acetylene:
Prest-O-Lite Co. of Canada, Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Imperial Brass Mfg. Co.

Wheels and Axles:
Canadian Steel Foundries, Ltd.
Hadfields, Limited
The Electric Steel & Metals Co.
The Wabi Iron Works

Winches—Power Driven:
Canadian Mead-Morrison Co., Limited.

Winding Engines—Steam and Electric:
Canadian Fairbanks-Morse Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Marsh Engineering Works
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
Mussens, Limited
R. T. Gilman & Co.
The Wabi Iron Works

Wire:
Canada Wire & Cable Co., Ltd.
Greening, B. Wire Co.

Wire Rope:
R. T. Gilman & Co.
Canada Wire and Iron Goods Company.
Dominion Wire Rope Co., Ltd.

Wire Rope Fittings:
Canada Wire and Iron Goods Company.

Wire Cloth:
Northern Canada Supply Co.
Greening, B. Wire Co.

Wire (Bars and Insulated):
Standard Underground Cable Co. of Canada, Ltd.
Northern Electric Co., Ltd.

Wolfram Ore:
Everitt & Co.

Woodworking Machinery:
Canadian Fairbanks-Morse Co., Ltd.

Zincium:
Everitt & Co.

Zinc:
The Canada Metal Co., Ltd.
Consolidated Mining & Smelting Co.

Zinc Spelter:
Canada Metal Co., Ltd.
Hoyt Metal Co., Ltd.

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Dominion Engineering & Inspection Co.	10	V		Y	

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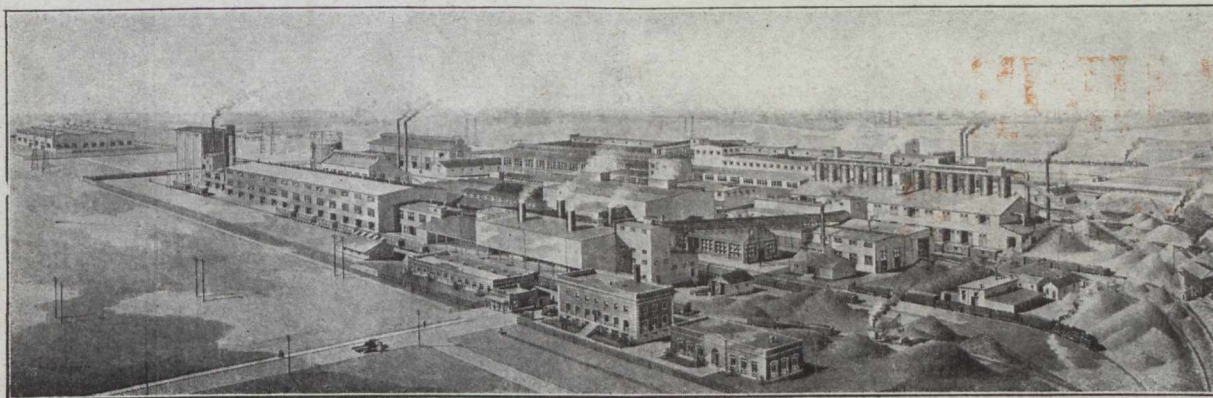
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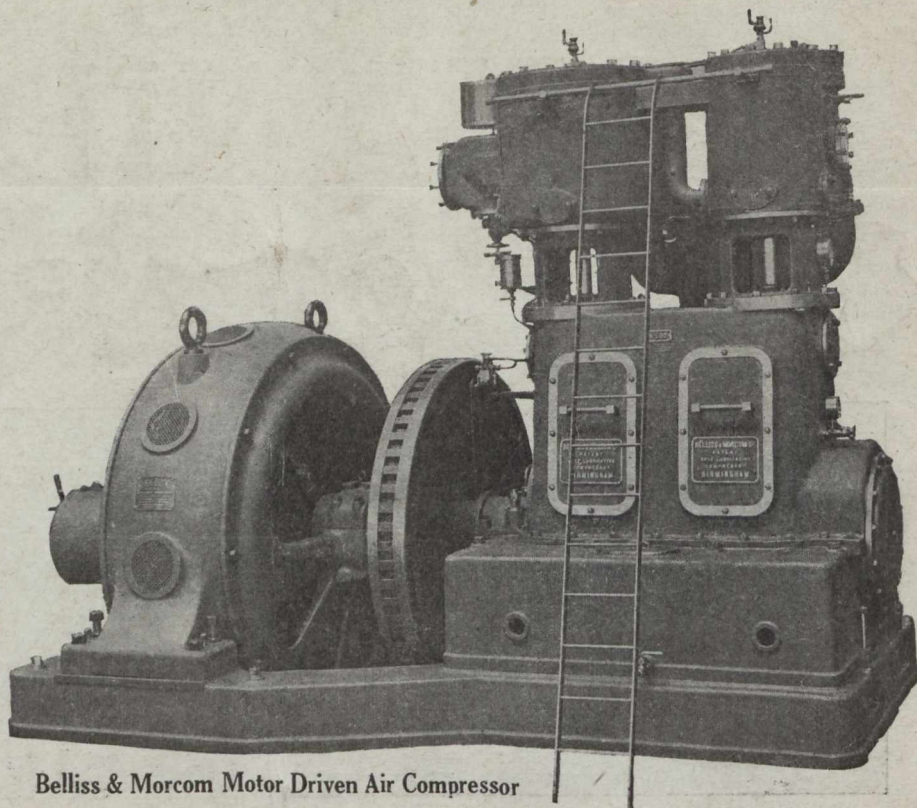
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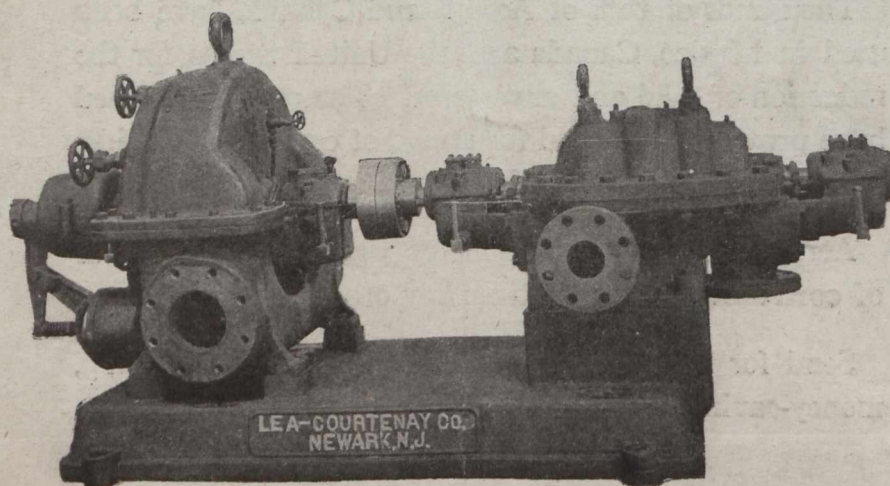
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