

CANADIAN MINING JOURNAL

Vol. XL

GARDEN CITY PRESS, Ste. Anne de Bellevue, DECEMBER 17, 1919.

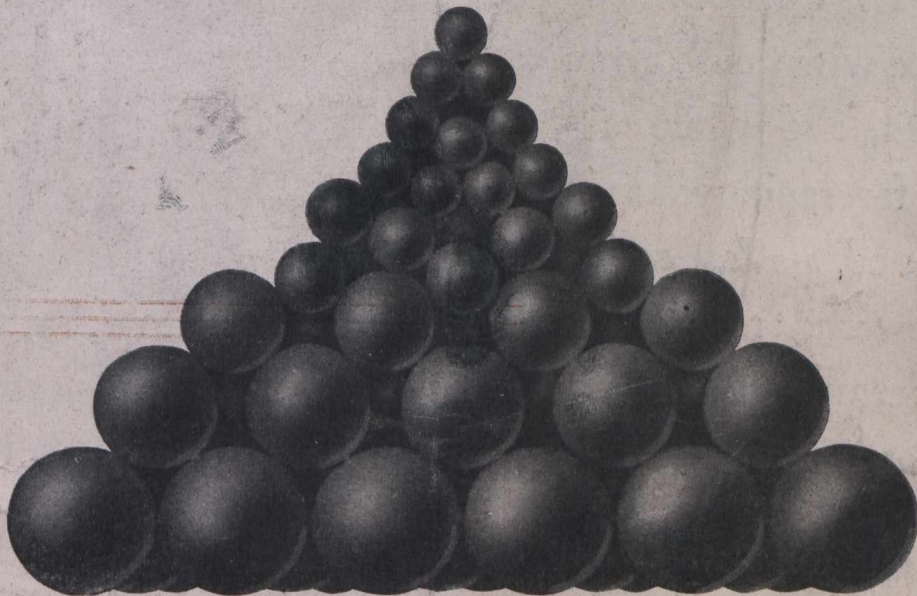
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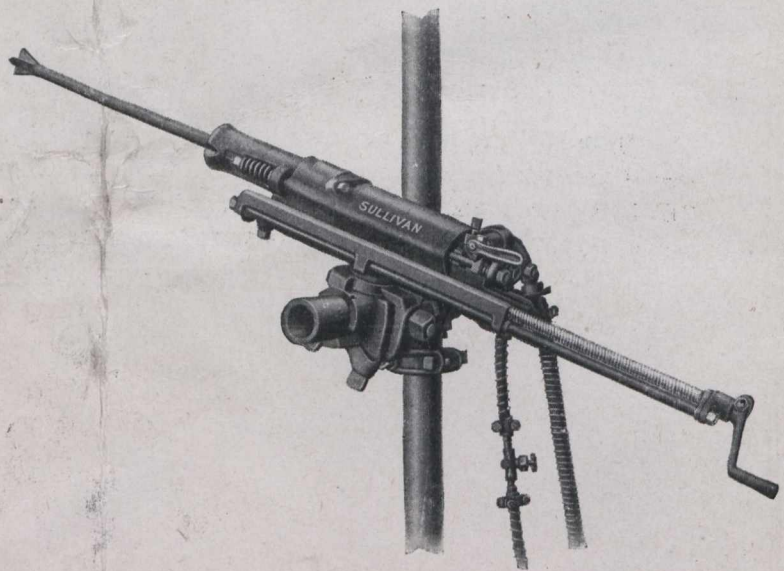
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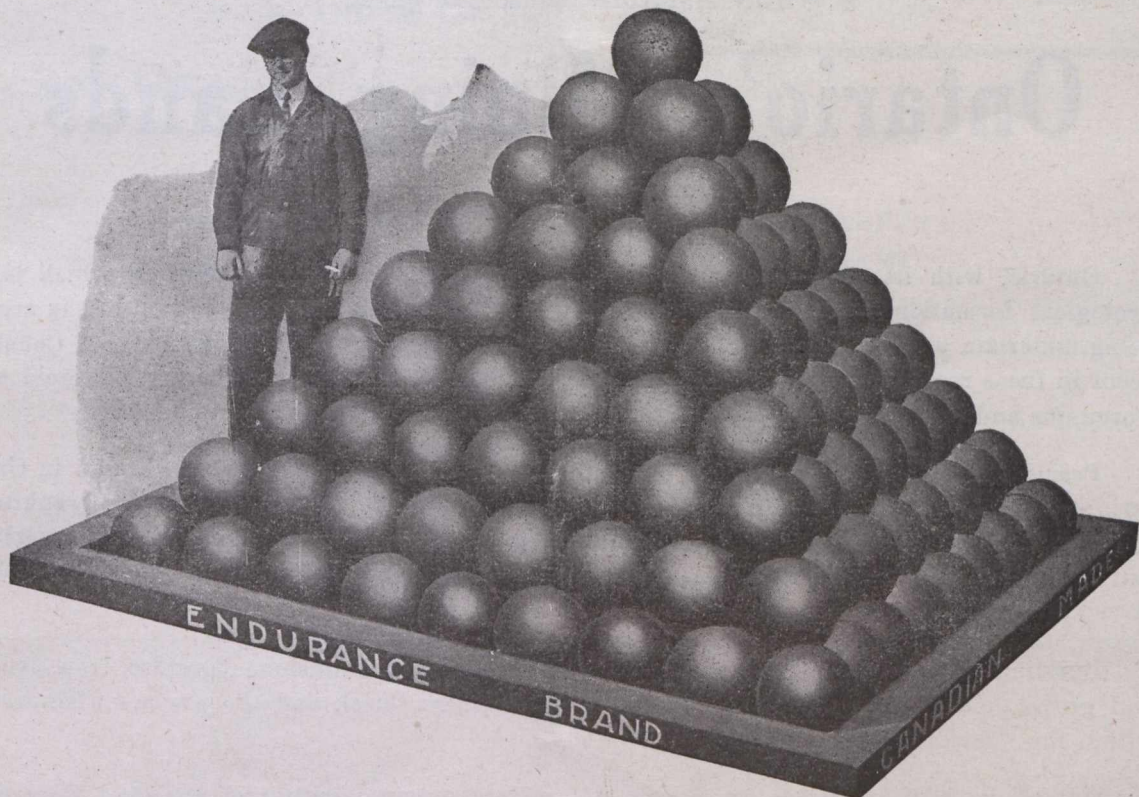
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Ontario in 1918 produced 45 per cent. of the total mineral output of Canada. Returns made to the Ontario Bureau of Mines show the output of the mines and metallurgical works of the Province for the year 1918 to be worth \$80,308,972 of which the metallic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

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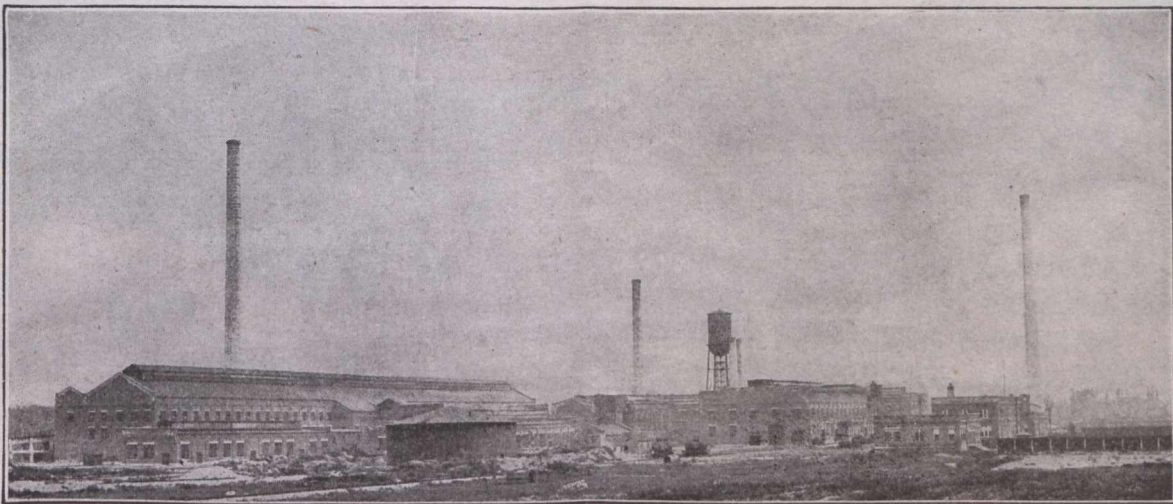
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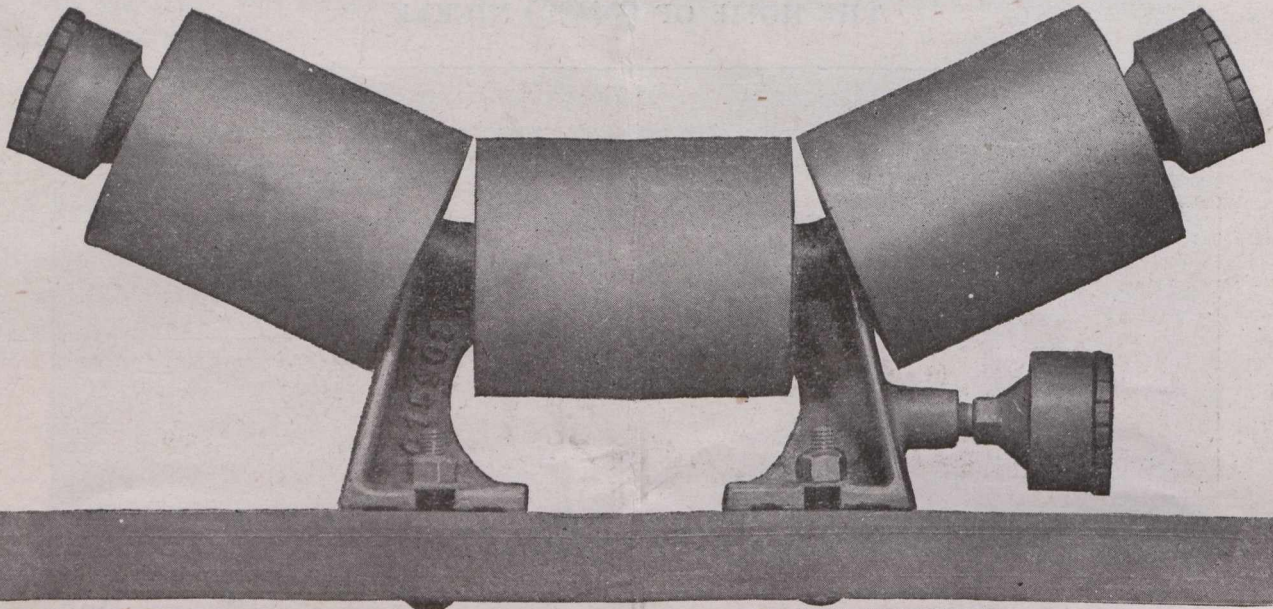
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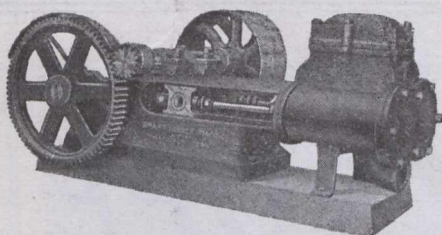


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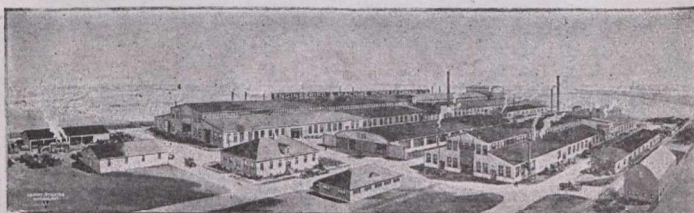
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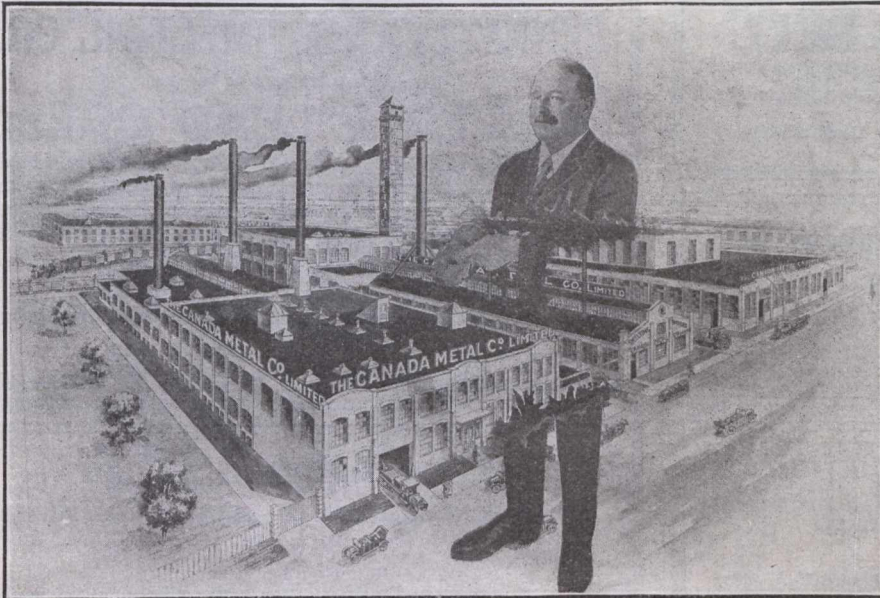
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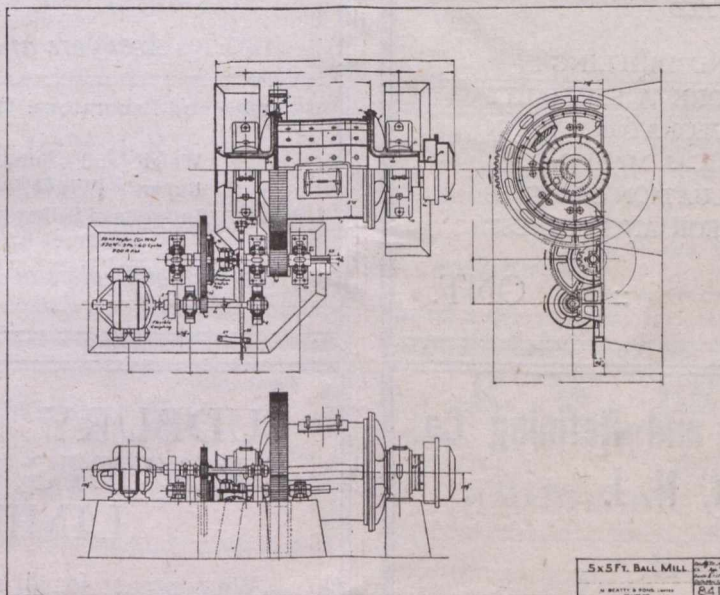
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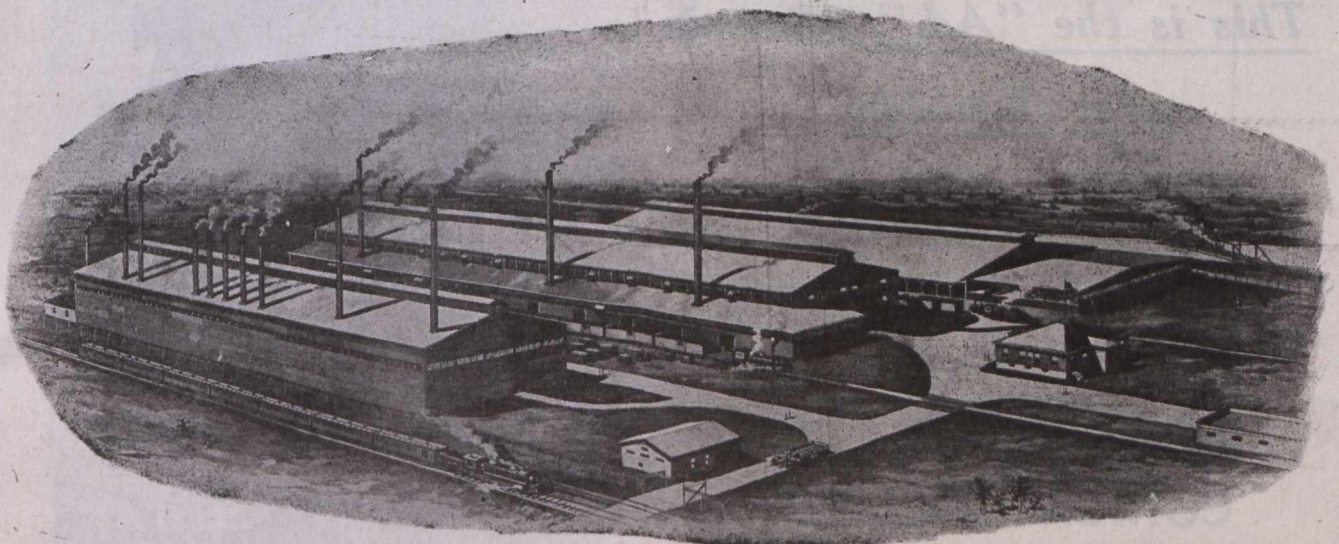
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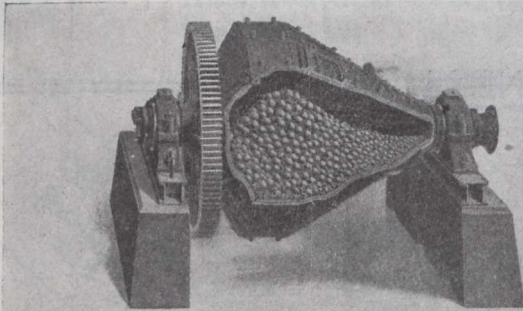
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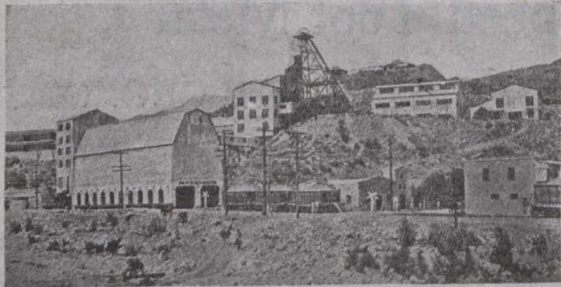


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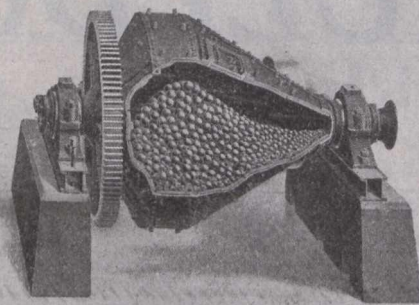
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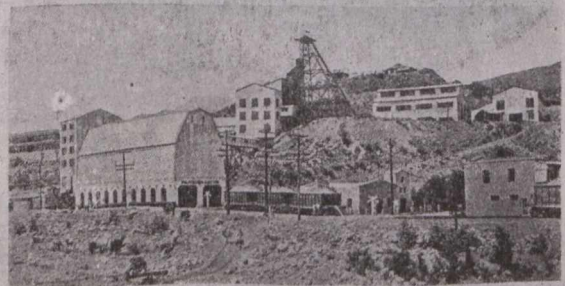


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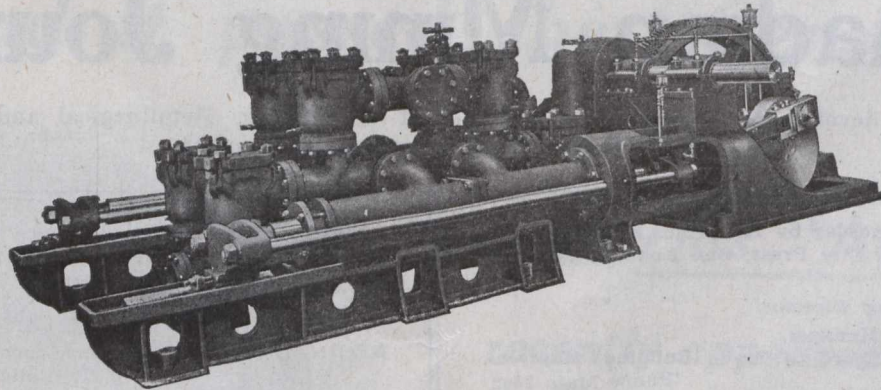
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Gould Fig. 1612. Size 6 $\frac{1}{2}$ " x 20". Double-Acting. Outside End Packed Horizontal Duplex Plunger Pump. For High Pressure Service

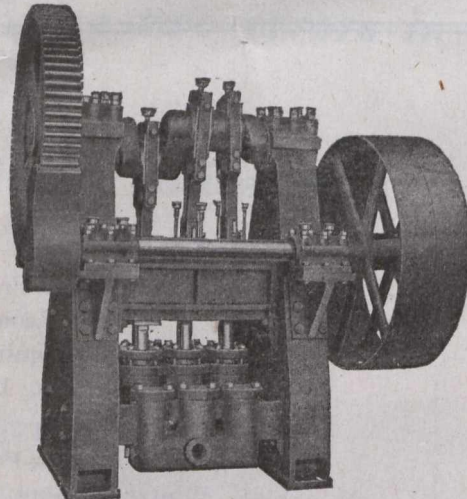
FOR General Water Supply, Municipal Waterworks, Oil Pipe Lives, and General Services, requiring high pressure and large capacities.

Capacities ranging from 155 gallons per minute at 1500 pounds pressure to 705 gallons per minute at 335 lbs. pressure. Complete data and description in bulletin 115. Copy on request.

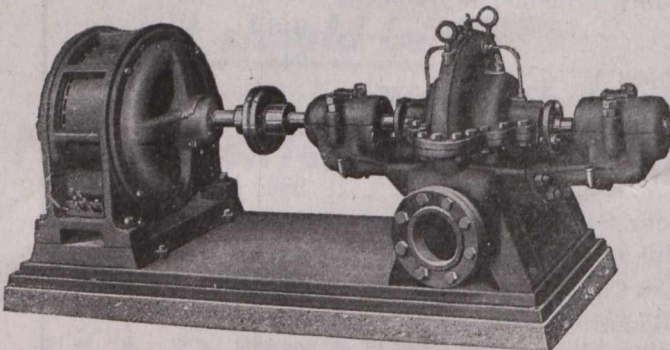
FIG. 1628. For general water supply, Municipal Waterworks, Mine Pumping, etc., where the total net head does not exceed 1305 feet. Made in six sizes, with capacities ranging from 9,360 gallons to 27,500 gallons per hour and for 140 to 565 pounds Working Pressure.

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

Our Coal Problem

The Toronto "Globe" says editorially: "The report that Nova Scotia coal will be shipped to Ontario will scarcely bear analysis. The railway rate from the mines in Cape Breton to Toronto would be about \$7.40 a ton. From Pittsburg to Toronto it is \$3.50. Steam coal from the United States sells in Toronto for about \$6.25 per ton, or a dollar less than the railway charges alone upon the Nova Scotia product. Even if Cape Breton coal were hauled for nothing it would cost almost as much as the United States coal laid down in Toronto."

Let us examine this statement. In the first place, there are coal mines in Nova Scotia which are much nearer to Toronto by rail than the mines of Cape Breton. The Cumberland coalfield is almost 250 miles nearer Toronto than the Cape Breton mines. There is no need to contemplate the hauling of coal by rail, except in a national emergency like the present, but supposing for argument's sake it were done, there would be one advantage in that all the money expended in wages and materials would be spent in Canada and not given to the railroads of the United States. Moreover, it may be pointed out that the cost of the rail haul from Pennsylvania to Toronto is not a purely competitive haul. It is a fortuitously cheap rate, made by the United States railroads to provide an outward freight for cars coming to Great Lakes ports to load iron-ore, which otherwise would make the journey towards Canada unloaded.

The largest tonnage of Nova Scotian coal shipped by water to Montreal in past years was slightly under two million tons, but that quantity did not by any means exhaust the possibility of water shipments from Nova Scotia. The production of coal in Nova Scotia, but for certain unfortunate tendencies, could by this time have reached ten million tons annually, and not two millions, but five millions of tons could have been available for water shipment up the St. Lawrence. Given sufficient men, sufficient ships and additional unloading capacity at St. Lawrence ports, there is no inherent difficulty in shipping five million tons of coal or more from Nova Scotia to Montreal and points further west.

The coalfield of Pictou is within a half day's rail-haul from Halifax, and there is not the slightest reason why Halifax should not become just as important a coal-loading port as Sydney, Cape Breton. Simi-

larly, the port of Parrsboro is within 40 miles of the Springhill Mines, and this port is already equipped for loading coal cargoes to a much larger tonnage than has yet been attempted.

There seems to be a settled idea that somewhere about Brockville, Ontario, exists a western limit to the competition of Nova Scotia coal with United States coal, but this is a matter that has never been recently tested. While it is unfortunately true that the cost of coal production in Nova Scotia has greatly increased during the war, it is equally true that a great deal of this increase is due to reduced production. While the capacity of the existing coal mines in Nova Scotia for output is gravely decreased, it cannot be suggested that the limit of possible production of coal in Nova Scotia has either been reached or attempted. It certainly has not.

It may be soberly stated that the economic possibility of sending Nova Scotia coal to points west of Montreal has not even been examined, let alone tested, under the changed conditions brought about by the war.

Toronto people may rid themselves of any idea that they will ever again be able to buy United States coal—unless it be a refuse and dump product—for \$6.25 per ton laid down in Toronto. The cost of coal production in the United States has undergone the same processes of increase as have taken place in Nova Scotia and in Europe, and on top of these come the new increase of at least fourteen per cent, plus the certainty of reduced hours of labor and a smaller production per man. Also, it was significantly stated by the United States Bureau of Mines recently, that the production of coal from seams three feet under in thickness, during the last mines year, was 20,000,000 tons. This is one proof amongst many that the United States coal seams have been picked over. No actual shortage of coal is to be feared in that richly endowed country for many generations, but the most accessible, the thickest and most cheaply mined seams have been very appreciably depleted. An annual coal production of between 700,000,000 and 800,000,000 tons leaves a hole in the ground.

In short, United States coal is on an altered competitive basis, and Canadian coal producers cannot be said to have yet tested that basis.

The Toronto "Globe" puts forward no argument for the use of United States coal but that of lesser cost when compared with the Canadian material. This argument would be quite a proper one were Toronto in the United States, but there are two sides to this matter. Canada could supply herself quite comfortably with at least ten million tons of bituminous coal annually in excess of the tonnage of Canadian-mined coal now used in Canada. At the low price of five dollars per ton, this tonnage would represent \$50,000,000 that is now spent in the United States, that could and should be spent in Canada, which is equivalent to unnecessarily increasing our adverse trade balance by \$100,000,000 per annum. This is one of the reasons why Canadian funds are at a discount of eleven per cent in New York at the time of writing.

When the increase of wages taken by the bituminous coal workers in the United States has been applied to the cost of coal to colliery fires, to the manufacturing costs of the materials that enter into the production of coal, to the cost of railway freights, and

has come again full circle to the coal-miner's living costs, it will be found that fourteen per cent is but a fraction of the ultimate increase in the cost of United States coal in Toronto.

If the manufacturing interests of Central Ontario say—without further enquiry—that they cannot possibly use Nova Scotian coal, because it costs too much; and if, on the other side, the coal operators of Nova Scotia do not vigorously attempt to regain their old St. Lawrence markets, and extend them further, as the altered competitive basis suggests they could if they tried, then Nova Scotia will see its coal trade still further decline, and Toronto and its environs will become still more the economic vassal of the United States.

It is not correct to state that the extension of the market for Nova Scotia coal will not bear analysis. It will both bear and repay the closest analysis, and the day is coming when the use of Nova Scotia coal in Toronto will be an accepted commonplace.

Miner's Lamps

A correspondent of the Maritime Mining Record suggests that consideration is being given by the larger coal companies in Nova Scotia to the use of the cap type of electric miners' safety lamps, a very natural development from the great strides that have been made in recent years in the perfection of the electric lamp for the use of miners, and more particularly coal miners.

Recently the Editor had an opportunity to visit some of the collieries in Vancouver Island and was struck by the fact that the old safety-lamp had been entirely superseded by the cap type of electric lamp, except for the use of gas-testing by officials. It was a revelation in comfortable vision underground to walk behind a party of men wearing these lamps, and not to experience the discomfort of walking behind a collection of dazzling and bobbing points of light.

In the Nova Scotian collieries, since the introduction of safety lamps some fifteen years ago, there has been an appreciable increase in the number of cases of nystagmus. This affection of the eyes of miners has been assigned to various causes, but the consensus now is that it is caused by deficient illumination, or, more specifically by the effect of a concentrated pin-point of light surrounded by complete darkness. Relief has been experienced from the white-washing of large areas of the mine roads, which does not increase the illumination present, but avoids the painful contrast between a point of brilliant illumination and the surrounding darkness. Two advantages in the electric cap-lamp are the greater illumination it affords, and

the fact that the light is thrown in front of the eyes of the wearer without shining directly into the eyes. A third advantage is that previously mentioned, when men are walking underground in single file, as they so often have occasion to.

From the point of safety, the electric lamp is distinctly superior to the ordinary oil lamp. The writer was told by the superintendent of one of the Western collieries that the number of accidents among men engaged on the haulages has materially decreased since the electric cap-lamp was introduced, as its use permitted the wearer to have his hands free, and he was not distracted from his work by necessity to handle his safety lamp with great care for fear of losing his light. With the cap type of safety lamp, there is no necessity to hang the lamp on a prop or other handy support, or to place it on the ground, both of which practices lead to broken glasses and other damage to oil safety lamps, with consequent danger from exposure of the naked flame to the atmosphere of the mine.

The electric lamp also requires no oxygen for flame combustion, and gives off no combustion products to the mine air. This is an important matter, and will be specially important in submarine mining when the faces reach out to sea to a distance requiring auxiliary forms of ventilation current and supply.

One colliery in Nova Scotia is already supplied with the electric cap-lamp, with very satisfactory results. It will not be surprising to hear of the adoption of electric safety lamps in all new collieries, and the

gradual replacement of the oil lamp by electric lamps in the older collieries.

The question of gas detection should impose no obstacle to the introduction of the electric lamp in a properly organized colliery, and in most cases it will be a distinct advantage to have it clearly understood that the official who is charged with the duty of making observations for the detection of inflammable gas

is the only person on whom this responsibility is imposed. The presence of monoxide cannot be detected by an oil light. The presence of carbon dioxide should not be looked for in any modern and well ventilated mine, but all the requirements of gas detection in the mine air can be fulfilled by the use of a limited number of oil safety lamps in the hands of properly appointed and qualified officials.

Scotia Acquires Control of Acadia Coal Company

The official announcement that the Nova Scotia Steel & Coal Company has acquired the controlling interest of the Acadia Coal Company, and will now enter into the management of the properties and mines of that Company, is of very great interest to the coal trade in Nova Scotia. It is an encouraging event, in a good many respects, but not the least hopeful feature which is disclosed by this extension of the Scotia interests, is the progress made towards a realization of the chief need of the coal business in Nova Scotia, namely, a consolidation of coal properties and interests. A number of years ago the writer formed the definite opinion that any stability or prosperity which had been achieved in connection with the coal mining activities of Nova Scotia was the result of a consolidation of interests, and that any future progress could only take place as an outcome of further consolidations. Later events have served to confirm this opinion.

The acquisition of the collieries of the Acadia Coal Company by Scotia will enable some notable economies to be effected by the use of electricity as a motive power, in substitution for the existing steam drives, at the Trenton works of the Scotia Company. It is not

generally realized by coal-mining circles in Nova Scotia, what a well-designed, modern and efficient power-plant the Acadia Coal Company possesses at the Allan Shafts at Stellarton. A description of this plant has appeared on several occasions in the columns of this Journal. It may be taken for granted that full use will now be made of the capacity of this plant for the generation of power that can be transmitted with little cost to the Trenton Plant, which is within sight of the Allan Shafts.

The possibility of the acquirement of the Acadia properties by the Scotia Company has for some time been a live topic in the County of Pictou, as it has been presumed, and correctly presumed, that such a consolidation forecasted the permanence of the steel-working industry at Trenton. Steel manufacturing processes are always an outgrowth of the possession of coal, and popular opinion in New Glasgow has been correct in associating such a consolidation as has now taken place, with much promise for the future stability of a district that was felicitously named New Glasgow, and has endeavored with marked success to emulate its larger namesake on the banks of the Clyde.

Christmas, 1919.

The Editor takes this opportunity to wish the readers of the Canadian Mining Journal a very Happy Christmas. Taking things large and by, the members of the mining community of Canada, which paradoxically enough, is an unusually scattered and at the same time an exceptionally united one, has much to be thankful for.

The material rewards which have come to miners during 1919 have not been inconsiderable. Our men—except such of them as will not come back—are home from the war, and are, for the most part, back in harness. The year has been marked by much new

discovery and testing of not fully known mineral areas. The well-grounded belief of the mining engineers of Canada in our country's latent mineral resources has been strengthened.

The Canadian miner, better than any other man, knows that we possess a good land and a vast one, because he has usually seen it first. He may be regarded as an incurable optimist, but usually he knows whereof he speaks. To its readers, in scattered camps, in a land that stretches "From Sea to Sea, and from the Great Waters to the Ends of the Earth" the "Journal" extends its heartiest and seasonable greetings.

Newfoundland's Coal Areas

By E. D. HALIBURTON, Port-au-Port, Newfoundland

For many years coal has been known to exist in Newfoundland, but until twelve months ago no serious attempt was ever made to prospect, much less to mine these coal deposits. Within the past year two companies have begun operations, though as yet they have exerted themselves rather in prospecting than in mining, and although the existence of large deposits of workable coal seems probable, enough work has not yet been done to make the probability a certainty.

The more promising of these areas is that owned by the St. George's Coal Fields Co. This is a local Company capitalized at \$500,000, the shares being owned mostly by Mr. Thomas J. Freeman of St. John's, in payment for the property. It lies about ten miles from the coast and seven miles from the Reid Newfound-

land Railway, between the Robinson and Middle Barchoix Rivers, and consists of four square miles of level, thickly wooded country capable of supplying pit-props and building material for a long time. On this area sixteen seams have been located and it is reasonably certain that others exist. The four principal seams are: The Juke's, the thickness of which, measured at right angles to the roof varies from 4 ft. 8 inches to 6 feet; the Howley, 4 ft. 2 inches; the Cleary, 2 ft. 2 inches; and the Murray, 5 ft. 4 inches. The coal is of a very good quality, bituminous, and free from sulphur and there is one small seam of cannel. The associated strata consists for the most part of a greenish grey sandstone.

Computations based on the known outcrops alone,



Map showing the Carboniferous Areas of Newfoundland

Taken from "Coal Resources of the World."

place the amount of coal present at over one hundred million tons, but so far the company has not been financially capable of employing a drill to aid in corroborating these figures, though it is hoped to do this next Summer.

The Jukes seam has been partially opened up by the efforts of half-a-dozen miners who have been working there for the past year. Practically none of the other seams have been touched. The Jukes seam strikes north and south, and dips east 52 degrees. About a thousand yards from its outcrop in the river bank, it is cut transversely by a deep gulch and from the bottom of this gulch the men have tunnelled into the coal along the line of strike, 165 feet towards the north and 150 feet towards the south. Throughout this distance the dip and strike continued perfectly uniform. The floor of the seam consists of hard rock with a thin layer of fire-clay between it and the coal and about six inches of debris had to be cleared away to get a solid roof cover. The men are now sinking a shaft some distance to the north in an endeavor to locate the seam again. It is so situated that a great part of it could be stripped of its cover and mined opencast for a long time; and in other cases by shaft and levels, driving heads uphill and letting down the coal to the main level, where it could be hauled in trucks to the shaft.

It is believed that these seams are the western outcrop of a large synclinal basin of coal which outcrops again about five miles to the north-east. According to maps and reports drawn up by the late Alexander Murray and James P. Howley, F.C.S., this basin is shallow, the depth from the surface to the trough of the syncline probably not exceeding one to two hundred feet, and the dip of the seams consequently being gentle. The area occurs in a great, level expanse of undisturbed country, which would imply that the coal beds ought not to be seriously faulted or disturbed.

Commercially the locality is not inconvenient. It would not cost very much to make "Crabbes," ten miles to the west a good summer port, and "La Poile," forty miles south is a splendid harbour open all the year round.

Lack of financial backing prevents the present development of these areas, but it is hoped that within a few years Newfoundlanders will realize the value of latent wealth and heat lying dormant there and invest sufficient capital in the Company to develop the coal deposits and thus supply the island with its own coal. The Government is doing its utmost to encourage the company and has granted them many valuable concessions, besides binding itself to pay a bonus of one dollar on every ton of coal produced.

Reid's Coal Fields.

The other coal deposit is at South Branch on land owned by the Reid Newfoundland Co. It is divided by a ridge of mountains, and lies about thirty miles southwest of the St. George's Coal Fields, being also about ten miles from the coast.

This deposit is so far known to consist only of a single seam from twelve to twenty-two feet wide, which dips vertically. It is situated in more or less disturbed country. A mountain of igneous rock rises near the mine and leads to the belief that a batholith once forced up these coal measures to be eroded later during the glacial period. The facts can only be disclosed by actual development work.

Last winter about one hundred men were employed by the company, and about three thousand tons of coal was mined by the overhead method, a slope being drifted into the hill along the strike. This coal was hauled to the railroad about four miles away, by teams. At present twenty men are employed and they are sinking a prospecting shaft which is 120 feet deep, at which depth the coal has become much harder, while the width and dip remain the same.

Mining activities of the Reid Newfoundland Company, now come under a newly formed department of that company, known as the Newfoundland Development Company, at the head of which is Mr. Forbes, M.E., and associated with him is Mr. Hatch, Mining Geologist, well known in the Cobalt District.

WINTER MINING COURSES FOR PRACTICAL MINERS AT THE COLLEGE OF MINES, UNIVERSITY OF WASHINGTON

The College of Mines, University of Washington, Seattle, advertises courses in Quartz Mining, Placer Mining and Coal Mining, from January 5th—March 25th, 1920. The expenses consist of a fee of ten dollars and laboratory deposits for materials actually used by the individual students. Ex-service men are exempt from the fee of ten dollars. No previous training is asked from entrants, who are merely required to be able to read and write English.

The courses offered are as follows:

Quartz Mining

Flotation and Gravity Concentration.
Ore Mining Methods.
Assaying for Gold, Silver, Copper, Lead, Tin, Antimony and Tungsten.
Geology and Mineralogy.
Mine Surveying.
Chemistry.
Mining Law.
Forge and Foundry.
Mine Timber Framing.

Placer Mining

Testing Placer Ground.
Hydraulics.
Dredging for Gold.
Melting and Refining.
Surveying.

Coal Mining

Analysis of Coals.
Surveying.
Lamp Testing.
Mine Rescue and First Aid Training.
Coal Washing Methods.

The College of Mines is to be congratulated on its enterprise. There is no greater educational need today than to bring the faculties of our large universities into actual contact with the worker at his work. Happy is that mining district which is situated sufficiently near to a university to permit of the extension of its teaching activities to men actually engaged in mining.

The university extension idea is a good one, and we do not think it is possible to overdo the extra-mural work of the modern university.

COUNTRY ROCKS OF ELLIOTT PITCHBLENDE DEPOSITS.

By R. E. HORE.

Some descriptions of the pitchblende deposit in Butt township, Ontario, have been published in the Mining Journal. I have recently had occasion to examine more closely some of the rocks collected when I visited the deposit, and am submitting a few notes for publication, as they may be of some use to others.

The pitchblende bearing feldspar-mica-quartz dyke where exposed at Elliotts' discovery lies against a medium grained gray rock. It is made up largely of nearly colorless grains of feldspar and quartz; but has regularly distributed through it a very large number of crystals of dark minerals—biotite and hornblende. The mica is more conspicuous and more easily identified than the hornblende, but the latter is quite abundant.

Microscopic examination shows the hornblende to be of a rather unusual variety. It is blue in color, while the common hornblende is green in thin sections. Most of the mica crystals show the brown pleochroic colors of biotite, but there is also present some pale green muscovite. The rock is for the most part unaltered, but there are some small areas of secondary minerals—chiefly carbonates.

The hanging wall rock is not exposed at the Elliott deposit. An outcrop at the outlet of the lake has an unusual appearance, the rock having a decidedly brownish color, even when freshly broken. It is a finely granular rock and the mineral constituents are scarcely determinable without a microscope. The cause of the brownish color of the light colored minerals is at once evident under the microscope. The feldspar and quartz are in very small crystals and scattered through the aggregates of feldspar and quartz are very numerous minute grains of a mineral resembling hypersthene. It is pleochroic, being of pale gray color in some positions and pale pink in others, varying in color according to the direction of light vibration. It would doubtless appear as a dark brown mineral by reflected light when examined in the ordinary way by the naked eye. The most prominent constituent of the rock is hypersthene, of which there are abundant crystals similar in character to the small grains which occur in the feldspar aggregates. There is also present some strongly pleochroic brown hornblende.

The area in which the Butt pitchblende deposit occurs forms part of the great Pre-Cambrian crystalline formations generally described as granite gneisses. The rocks examined are, however, not the common types, and their unusual character may be of some help in exploration.

METAL QUOTATIONS.

Fair prices for ingot metals at Montreal, 17th December 1919.

	Per lb.
Electro copper.....	24½
Castings Copper.....	24
Lead.....	8½
Tin.....	60
Zinc.....	10¾
Antimony.....	11
Aluminum.....	33
Steel Bars (nominal).....	\$3.10
Plate (nominal).....	\$3.35

CANADIAN MINING INSTITUTE.

This Dominion possesses no organization of greater practical importance or of greater potential usefulness than the Canadian Mining Institute which held its annual convention in Vancouver recently.

In the nature of the case, there must be a good deal that is technical in the discussions, but there are also many questions coming up which are of deep interest to the public at large. A cordial invitation is extended to all who may wish to be present, and it is hoped that many will take advantage of it. They will have a chance of learning a good many things that may prove profitable as well as enlightening.

Among the matters the Institute will have under consideration is the advisability of "going into politics." By this they do not mean the advisability of trying to elect anybody in particular to parliament or legislature. What they suggest is the exercise of a non-partisan influence for the development of the mining industry. The idea that they could do valuable service in this way, sounds reasonable.

From time to time there has been talk of forming a Western Institute, owing to the difficulty of holding meetings at points so far apart as here and Montreal. Hitherto, however, the benefits of a common organization for the whole country have been felt to outweigh any incidental inconveniences, and it is believed that this view will continue to prevail.—Vancouver "Sun."

INSTITUTE MEMBERS AT BRITANNIA BEACH.

On Saturday the members of the Canadian Mining Institute to the number of about thirty, including students from the mining department of the University of British Columbia, and several S. C. R. men, visited Britannia Beach, where they were shown over the mill, hydro-electric and compressor plants by Mr. Browning, general superintendent, assisted by Mr. Peterson, superintendent of transportation, Mr. Lee, mining engineer, and Mr. Hughes, mill superintendent.

The method of operation was fully explained by Mr. Browning, and Associate Professor Gillies took the students through the details of the operation. After an inspection of the mill, plants and townsite the party met at the company's offices, where they tendered a vote of thanks to Mr. Donohue, assistant manager, and the officials who had entertained them.

High appreciation was expressed of the enterprise shown in the development of the Britannia mine and its equipment, and of the patriotic work done at Britannia Beach during the war. Dean Brock and Mr. H. Mortimer Lamb, secretary of the Canadian Mining Institute, were appointed a committee to draft a letter of thanks to the company for the information afforded the visitors by the inspection of the plant; conveying to Mr. Moodie, the general manager, their admiration of the remarkable enterprise which they had seen, and the efficient manner in which it had been carried out; also conveying to Mr. Moodie, the sympathy of the Institute in the family bereavement which prevented him from being present on the occasion.

Three cheers and a tiger were given for the company and its officials. The visitors were then entertained to dinner by the company and left at 6 p.m. on the return trip to Vancouver well satisfied with the day's outing.—Vancouver "World."

Further Notes Regarding the Vancouver Meeting of the Canadian Mining Institute

A party of C. M. I. members took advantage of the trip to the Cassidy Mines of the Granby Consolidated Smelting Company which the local committee had arranged, and escorted by Mr. Thomas Graham, general superintendent of mines of the Canadian Collieries (Dunsmuir) Limited, visited the Cassidy Mine on Sunday, the 30th November, where they were met by Mr. E. G. Wilson, the superintendent of the Granby Company at Cassidy's.

The party included Capt. W. A. Richardson of Courtney Bay, Mr. G. H. Kilburn of Trail, Mr. Dudley Michell of Edmonton, Mr. W. R. Wilson of the Crow's Nest Pass Coal Company, Mr. Brewer, resident engineer of the Mines Department, Mr. F. W. Gray, editor of the C. M. Journal, and Messrs. McPhee, Gilchrist, Hailyard, McKechnie and Dixon, students from the University of British Columbia.

The party first visited the No. 1 Colliery of the Western Fuel Co. on Nanaimo Bay, the oldest and the most consistently successful coal mine on the Island, where they were shown round the surface by Mr. Stirling, the general manager. The workings of this colliery are entirely submarine, and a unique feature is the man-shaft on Protection Island. Coal is being mined both from the Newcastle and the Douglas Seams.

From No. One, Nanaimo, the party motored to Cassidy's, where they inspected the unique plant recently completed there by the Granby Company, and previously described in the Journal. Unfortunately, the boiler inspector was at work, and the steam being off, it was not possible to inspect the workings of the mine. The lunch given to the visitors was most excellent, and the brand of pie manufactured at Cassidy's was voted to be as fine as the plant, and that is "going some." The situation of Cassidy's is beautiful by nature, and unspoilt by art. Superb timber occurs all around, and the plant is situated in a natural amphitheatre or alluvial flat, flanked by a heavily wooded hill which goes up rapidly for 300 feet. In a gorge below runs the Nanaimo River, a stream of deep green clearness, with steep banks covered with fine trees, hart's tongue ferns, and luxuriant bracken. The writer, after listening to Mr. Wilson's description of the colliery and its buildings, remarked that

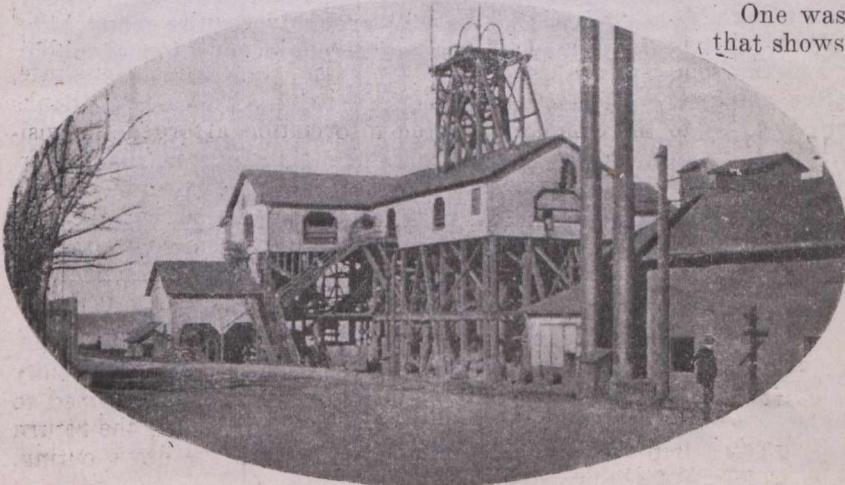
it sounded like the description in the Apocalypse of the City Beautiful close by the river of crystal, but actual inspection of the site proved a pleasant surprise, even after the written description had given some idea of what to expect.

On the return journey, the party were taken by Mr. Graham, who acted as the guardian and mentor of the visitors, to No. 5 Colliery of the Canadian Collieries, where the workings were visited. The nature of the coal occurrence is distinctly different from any of the eastern occurrences, and one would imagine that a thorough knowledge of local geology and some acquaintance with the earth movements was a first essential to successful coal mining in Vancouver Island. The visit was in the nature of new knowledge to most of the party, and was thoroughly enjoyed—even if it did snow on the way home.

To eastern eyes, a feature of the Vancouver Island collieries is the use of electric head-lamps, of the Edison type, in preference to the oil safety lamp. The advantages of this type of lamp cannot be denied. The use of Marcus screens and devices to lessen coal breakage seems general, and a particularly handy arrangement was the use of a small motor for raising and lowering the apron that drops the coal into the railway cars. Two items of equipment that interested the writer were a gravity-operated, three-car tippie at the No. 1 Nanaimo Colliery, and a coal-washer of the Robinson type, similar to one that used to do fairly good work for the Dominion Coal Company before it was destroyed by fire.

Another thing that struck one coming from a country where timber is small in size and costly in price, was the lavish use of excellent timber in the Vancouver Island collieries. Also one was struck by the evidence of a climate so mild as to permit washeries and other places where water was used to operate in the open air without enclosure or danger of freezing. No protection from the weather seemed to be necessary, except protection from rain. It was not possible for the party to visit the mines further up-country, but sufficient was seen by the party, thanks to the assiduous courtesy of Mr. Graham, Mr. Wilson, and other mining gentlemen in the Island, to make the journey very pleasant and informative.

One was interested in the evidence of the anticline that shows in the rocks near the old Hudson Bay Bastion near the waterfront of Nanaimo Harbor. The bastion itself is a fine relic of former days, which it should be the pride of the citizens of Nanaimo to preserve, and it was therefore extremely surprising to read in a Vancouver paper that the bastion was likely to be sold for taxes, and destroyed if these continued in default. One can with difficulty believe that such a proposal would be seriously made.—F.W.G.



No. 1 Shaft of the Western Fuel Co.,
Nanaimo, Vancouver Island, B.C.

A FLOOD OF TECHNICAL PAPERS.

At the technical meetings held at Chicago in the last week of September, probably a record was made in the number of papers presented on iron and steel subjects alone, saying nothing of those in other lines. At the sessions of the American Institute of Mining and Metallurgical Engineers at least 24 papers on iron and steel were presented, besides a half dozen on steel and allied subjects before the American Electrochemical Society and the Exposition of Chemical Industries, a session on pyrometry alone, lasting a whole day, had an array of 53 papers, of which 35 were presented by the authors or their representatives. Thirty-nine papers, of which 14 were read by title only, were offered at the technical sessions of the first convention and exhibition of the American Steel Treating Society.

In all, at least 120 papers on iron and steel and allied topics were scheduled for the three Chicago conventions. A week later at Philadelphia American foundrymen were offered a total of 42 papers, spread over four days of sessions on iron and steel foundry problems. This summary does not include 19 papers on the program of the American Institute of Metals for sessions in conjunction with these Chicago and Philadelphia meetings.

While many papers in these long lists were of a high order of merit, the question arises whether the effort to produce a large volume of literature for every such meeting has not been overdone. From those who attend the remark is often heard that there is too much to absorb. It can hardly be contended that any subject is so important that 53 papers should be scheduled for consideration at a single meeting.

The matter is serious enough to suggest to the managers of these various societies whether programs should not be curtailed, perhaps decidedly. It is generally conceded that two important benefits should be the result of such meetings—a discussion of papers and an interchange of views and the making of new acquaintances. In many cases at Chicago, where sessions were held morning, afternoon and evening, though not so much at Philadelphia, programs had to be rushed through, affording inadequate time for fruitful discussion. The papers can be read by the members at their leisure in most cases, many of them before the sessions, but the real benefit is the exchange of views on the floor of the convention. In most cases discussions of prominent papers should have several leaders pre-arranged for. Too often an excessive amount of time is consumed in presenting the papers. There is danger that this really vital part of the work of our leading technical societies may be made ineffective through straining after volume, unless some reform is instituted.—“Iron Age.”

Note:—This editorial from the “Iron Age” of 27th November, is interesting corroboration, from a United States source, of the similar views expressed in the “Journal” of the issue of 26th November.—Ed.

PERSONAL.

James P. Flynn, M.E., has changed his headquarters, his office now being on the fifth floor of the C. P. R. Building, Toronto.

TORONTO NOTES

**Proposed legislation to define status of the Engineer.
Mr. Tyrrell goes to England.. Notes from
the Ontario Capital.**

(Staff Correspondence.)

On November 28th the Toronto members of the Institution of Mining and Metallurgy of Great Britain dined together at the National Club and continued an informal meeting after dinner. It was decided, on the consent of the parent Institution being obtained, to form an Eastern Canadian or Ontario branch to discuss matters connected with the general welfare of the profession of mining engineering in Canada. Mr. J. B. Tyrrell, who is just leaving for England, was asked to submit the matter to the Council of the Institution in England. Those present at the meeting were Dr. Miller, Provincial Geologist and Messrs Tyrrell, Guess, Haultain and Segsworth. A number of other points connected with the welfare of the organization were also discussed before the meeting adjourned.

When Mr. Tyrrell returns to Canada in February he will go out to the Gabrielle property in Eastern Manitoba, Rice Lake District, the Gabrielle Mining Company having asked him to direct the development of the property. Gabrielle was the first property located in the Rice Lake District. They have two very good looking veins and there has been some work done on the property of which no records have been kept. A number of assays have been taken, all of which show good values. As the veins appear to be worth systematic development Mr. Tyrrell has accepted the position of consulting engineer and will also direct the development work when it is started.

It is stated that the Mining Corporation of Canada are surveying and erecting buildings on their pitchblende property in the township of Butt preparatory to active exploration. The Elliot Syndicate of Chicago, the discoverers of this ore of radium, are also going ahead vigorously and assays obtained by them are said to show 600 milligrams of radium per ton of pitchblende, together with 70 per cent uranium oxide. This oxide is now worth \$3 per pound. It is not, however, known how much pitchblende can be obtained from each ton of rock. The mineral is in small particles scattered through the pegmatite. Owing to the weight of pitchblende, which is about four times greater than the rock in which it is found, concentration is comparatively easy. It is pointed out, however, that the values given are for the pitchblende when removed by concentration. It will probably require many hundreds of tons of pegmatite to give one ton of pitchblende.

A meeting of the Toronto branch of the Canadian Mining Institute was held on Saturday, December 6th when the following executive committee was elected: C. E. C. Smith, chairman; J. H. Black, D. A. Dunlap, H. E. T. Haultain, R. E. Hore, H. L. Kerr, James McEvoy, W. G. Miller, W. E. Segsworth, J. B. Tyrrell, A. J. Young. The meeting, which was a representative one, unanimously decided to nominate O. E. S. Whiteside for president for the term commencing after the next annual meeting. There was considerable discussion on the proposed legislation to define the status of the Engineer and it was resolved that the chairman should appoint a committee to draft a bill applicable to Mining Engineers.

ANOTHER SOURCE OF SULPHUR.

For some time there have been occasional suggestions, more or less practical, for the utilization of the vast amount of sulphur dioxide which is annually wasted in connection with the use of the sulphide ores of Ontario. A method of utilization of this gas which gives every promise of success is reported to be in operation in connection with the Tacoma Smelter in Washington. The sulphur dioxide is liquified and since in this condition it is quite readily separated from air and other gases it can be placed in suitable containers and shipped to sulphite mills within reasonable distance.

The only places so far considered as a source of sulphur dioxide gas from Canadian mills that until last week had come to our attention were the operations in the Sudbury district of Ontario. The mills which are likely to find it most convenient to use liquid sulphur dioxide are those of the Spanish River Pulp and Paper Mills, Limited, although it is possible that other Canadian plants may find it possible to do so. Within a fairly short and direct shipping distance of Sudbury we find the three mills of the Spanish River Company, the three sulphite mills in the Niagara district, the new Kipawa Fibre Company at Temiskaming and possibly even the Abitibi and Mattagami Mills near Cochrane.

It was our pleasure a short time ago to hear a paper read at a meeting of the Montreal section of the Society of Chemical Industry on the "Zinc and Lead Deposits of Gaspesia." It appears that there is a particularly rich deposit of blende and galena in a vein which has outcrops almost in the centre of the Gaspé Peninsula. If these ores are transported to some point on the Baie des Chaleurs to the south to be smelted there would be available for cheap transport a considerable amount of sulphur dioxide gas. From an operation handling 100 tons of lead per day we should have available about ten tons of sulphur dioxide or the equivalent of about five tons of sulphur. If this were depended on as the entire sulphur supply for a pulp mill it can be seen that at ordinary rates of consumption such an amount would satisfy a mill making only about 20 tons of pulp, but if used simply for strengthening the acid in a sulphite plant it is impossible to predict how large a plant could be served because of lack of information on the amount of strengthening that would be possible or necessary.

These points are mentioned because in the discussion of the paper it was suggested that the sulphite industry would furnish a market for a by-product of the mines in the manner indicated. No doubt the development of these deposits will in time make larger amounts of sulphur available in the form of liquid sulphur dioxide, and if the smelters are located on tide water there are a number of mills which can very easily be reached by transporting the gas in tanks loaded on scows. In the immediate vicinity there is the mill a Chadler and it would not be a very serious matter to tow the scows to Bathurst and Chatham and they might even be moved up the Saguenay to Ha! Ha! Bay and Chicoutimi. If tank cars were used it would then be possible to reach the Nashwaak mill at St. John, N. B., the Fraser mill at Edmundston and many others in Eastern Canada. It is likely to be some time before such an extensive market will be served, but it is interesting to consider possibilities.—From "Pulp and Paper."

PRODUCTION OF HELIUM IN CANADA.

Eugene Coste, President of the Canadian Western Natural Gas Light and Heat and Power Company of Calgary, who was in Toronto this week, declares that Helium, which will shortly be produced in commercial quantities in Canada, may now be safely added to the Dominion's long list of natural riches as an established fact. Its value as a non-inflammable substitute for the hydrogen gas now used in dirigible balloons, thus practically rendering the danger to airships from fire negligible, is still further enhanced by its scarcity. Canada and the United States being the only countries in which it is found so far, Canada having the advantage in the matter of ease of extraction from the other gases and thus, also, of cheapness of production. Following the discovery made some years ago that helium was a constituent of certain natural gases found in Canada and that it itself was an inert non-inflammable gas, lighter than air, said Mr. Coste, it was brought to the notice of the British Admiralty by Professor J. C. McLennan who was on the Research Board of that body during the war. It at once became the subject of detailed investigation and experiment by the British authorities who, working in conjunction with Mr. Coste's company, erected experimental plants at Calgary. The United States Government, immediately after the entrance of that country into the war, begun similar work near Fort Worth, Texas, where three plants, costing \$1,098,000, were erected for the purpose of discovering the possibilities of the gas both as to the uses to which it could be put and the quantities in which it could be produced. Both Governments were convinced that it was an exceedingly valuable commodity for war purposes, as balloons changed with it had nothing to fear from incendiary bullets and projectiles, which were the menace of British airmen in lighter-than-air craft, and which were also the means of bringing many a German Zeppelin to the ground.

Experiments having proved that it could be produced in sufficient quantities, plans were under way to utilize it in the theatre of war and had proceeded so far that when the armistice was signed 200,000 feet enclosed in high-pressure cylinders were on the docks at New Orleans awaiting shipment to the war zone.

Experiments are now being conducted at the University of Toronto to discover if there are other uses to which helium can be put than solely as a buoyancy producer for lighter-than-air craft. Once the commodity is being produced in commercial quantities which Mr. Coste says will shortly be the case, aviation companies which are now in process of organization will be able to assure their patrons of perfect freedom from the danger of fire.

The triumph of the U. F. O. party in the Ontario elections is an expression of class consciousness. If the U. F. O. seeks to use its powers to benefit only the farmers it will fail, as all power founded on selfishness and class assertion will ultimately fail. History and Christian philosophy are very specific on this point.

The Ontario elections reflected more than anything else a revolt of the country mice against the town mice. All the same the history of the country visitor in town, according to the fable, has its warning lesson.

The Latent Iron-Ore Resources in Canada Lying North of Lake Superior

By J. J. O'CONNOR.

A country that is developing with the rapidity that Canada is to-day, and that is five years in arrears with all kinds of constructive development, into which iron enters so largely, and is dependant on imported ore for 95 per cent of its furnace supplies, is in an economic condition that should not be allowed to obtain any longer, particularly if we consider the vast deposits of low grade, beneficiable ores lying undeveloped in Northern Ontario.

It has been demonstrated on a commercial scale—but only after long and very costly experimentation—that low grade Canadian ores can be converted into the highest grade of ore, by various treatments, which may be collectively referred to, as beneficiation. Of beneficiable ores there are immense quantities. The prospected parts of Canada, more especially northern Ontario, are known to contain many millions of tons of these ores at points accessible by rail. Estimates, based upon diamond drilling, place the quantities of ore in certain northern Ontario deposits at figures ranging from 100,000,000 tons downward. In other provinces there are similar, though less definitely measured, possibilities.

In the district of Thunder Bay alone, an extensive range of iron bearing formation runs from Steep Rock Lake to Kaministiquia,, a distance of one hundred miles, and another belt from the east shore of Lake Nepigon, to Long Lake, a distance of sixty miles. Further outcrops of similar ore are found on Hunters Island, Little Pine Lake, north of Dog Lake, and Kawashkagama north east of Lake Nepigon. A rough estimate made by the United States Geological Survey of these ranges computes that they contain some 9,000,000,000 tons which would run 35 per cent iron content or better.

The ores are largely banded jaspilites, with intimate mixtures of specular ore or magnetite, with jasper, and depend upon some form of concentration to make them marchantable. It is also reasonable to assume that when extensive exploration by diamond drilling is inaugurated throughout these ranges, bodies of higher grade concentration will be found. Diamond drilling, at present under way, on the range east of Nepigon, has already disclosed large bodies of high grade ore, where nothing but lean jaspilites showed on the surface.

In this connection it may be pointed out that only about 50,000 feet of diamond drilling has been performed on the range of Thunder Bay district, as against some 7,200,000 feet on the United States ranges tributary to Lake Superior, up to 1911.

On Steep Rock Lake, the most westerly extension of the main iron belt, quantities of high-grade hematite-float, led to the discovery of a body of some 70 feet in width, of soft ore, by drilling. It is almost assured that the main body of the Lake is underlaid by this same body of ore.

On the Atikokan range, west of Sabawe Lake, some 15,000,000 tons of magnetite has been proved by drilling operations averaging 55 per cent iron, 13 per cent sulphur, .03 per cent phos. These are high sulphur

ores, which, when roasted, make a most desirable product.

East of Sabawe Lake, the Atikokan Mine, the only developed mine in the district, shows some 10,000,000 tons, averaging 55 per cent iron, 2 per cent sulphur, and .10 per cent phos. The output up to date is 86,433 tons averaging 59.85 per cent iron, 2 per cent sulphur and .11 per cent phos.

In the neighborhood of Kaministiquia station, and in the township of Conmee, a large tonnage of lean ore is exposed averaging 35 percent or better. Tests made by the Dominion Testing Laboratories, Ottawa, show that by coarse crushing and jigging, a product running 50 per cent in iron can be obtained with a 2 to 1 concentration.

On the east shore of Lake Nepigon, on the Leitch and Ralph properties, there are numerous bodies of ore running around 45 per cent iron, drilling operations are now being carried on on the Leitch lands with highly satisfactory results.

Further east, on the same range, at Little Long Lake, over an extensive area of iron outcrops, one body 30 feet in width averages 42.67 per cent iron, .05 per cent phos, and another 400 feet wide 42.35 per cent iron, still another 20 feet that averages 49.78 per cent.

The Loon Lake iron field is of a different geological age and character. It is situated 23 miles east of Port Arthur, and is an undoubted eastern extension of the Mesaba range in Minnesota. The beds are flat lying, consisting of interbanded layers of high grade hematite, and lean taconite, and having a total thickness of about 20 feet. The ore is easily separated by hand sorting, yielding from 1¾ to 2 tons of merchantable ore, for every 3 tons of material handled.

By diamond drilling and pitting, the following tonnage has been proved:

	Tons.
McConnell—sorted ore 55 per cent iron..	1,650,000
McConnell—sorted ore 50 per cent iron..	2,430,000
Herstrom—natural ore 48.85 per cent iron..	200,000
Marks-Wiley—natural ore.....	1,168,000
	5,448,000

The ore is particularly low in phosphorous, averaging from .008 per cent to .03 per cent, and would consequently be in good demand. Less than one-third of this field has been drilled, conservative estimates place the tonnage of this field at 25,000,000 tons.

The District of Algoma has very large ore supplies. In the Michipicoten district, 111,000,000 tons of siderik ores have been proven by diamond drilling and many known large deposits are as yet untouched.

The District of Sudbury is rich in this basic metal. At Moose Mountain, 100,000,000 tons of magnetite ores have been proven by diamond drilling, and estimates of the possible quantity go far beyond this figure.

With these great deposits, which may only become assets by development, it would seem that it should be the first duty of government to offer such assist-

ance in their exploitation, as would make Canada independent of foreign ores, and not almost wholly dependent, as she is to-day.

Of the 2,242,337 tons of ore charged to Canadian blast furnaces in 1918, 2,145,593 tons. The percentage of imported ore has been steadily in the increase for some years. In addition to the ore imported, Canada imported \$153,000,000, worth of iron and steel products, and 67,396 tons of pig iron, in 1918.

These are startling figures, and should awaken some action on the part of the government.

With the exception of the Michipicoten district, every one of the above ranges is traversed by the Canadian National Railway, a further, and most important reason why the whole people should take an active interest in the development of our iron ore, as it would furnish much needed traffic for the railway. In the United States the mining industry contributes 60 per cent of rail traffic. In Canada less than 40 per cent originates thus.

"LAMINATED COAL"

At the statutory meeting of Laminated Coal, Limited, recently held in London, England, the following statements were made by the chairman, Mr. H. F. Smalman-Smith:

"It is scarcely three months since this company was entitled to commence business, and it must therefore be conceded that there has not been time for phenomenal development. The company was formed to acquire certain patent rights, licenses, and other assets in connection with a process known as the "laminating" of small coal. This process must not be in any way confounded with "briquetting." It consists, in part, in "stratifying," or placing the treated material in layers one above another, which by this means, coupled with that of synthetic action during combustion, becomes physically and scientifically reconstructed into a new lump of coal.

In addition to the treatment of small waste coal, this company has extended its operations to the treatment of peat, lignite, oil shale and other substances of a like nature. The result is that nearly all waste products from these materials, as well as the materials themselves, are capable of being converted into fuel of high calorific value, suitable for household and industrial purposes. The cost of manufacture will allow of its distribution at a price considerably below that of ordinary large coal."

The chairman stated that licenses had already been issued to important plants in Britain to erect plants, and that shortly a demonstration plant would be completed at which colliery owners could see their own materials reconstructed by the new process. The process, the speaker anticipated, would become one of world-wide industrial importance.

We would comment that there appears to be for once something new under the sun, and it will be, to say the least, interesting if this new process can improve on the age-long processes of nature, which, we believe, were effected by earth movements and temperatures of a power and range that finite man can only faintly comprehend.

More exact particulars of the announced process are awaited.

OBITUARY.

Stephen Pearson Brown, formerly chief engineer of the Mount Royal Tunnel and Terminal Co., Ltd., Montreal, was drowned last Sunday in Sebec Lake, Maine. Mr. Brown was pulling his nine-year-old son on a sled when the ice broke under him and he sank before the boy could summon help. Mr. Brown was about forty years of age. He was a graduate of the Massachusetts Institute of Technology, and before going to Montreal had been associated with the construction of the Pennsylvania Tunnel in New York City. He went to Montreal in 1912 in charge of the Mount-Royal Tunnel project and superintended the design and construction until the work slackened in 1916, when he returned to the United States, as vice-president and manager of Ford, Bacon & Davies, a well-known firm of engineering contractors of New York City. Mr. Brown continued to act in a consulting capacity in regard to the Montreal terminal work for the C. N. R., and was expected in that city this month on business in connection with the C. N. R. enterprise. From 1915 to 1917 he was a member of the council of the Canadian Society of Civil Engineers. Mr. Brown was also a member of the Institution of Civil Engineers of Great Britain, the American Society of Civil Engineers and numerous other engineering, railway and scientific societies.—From "Canadian Engineer."

Members of the Canadian Mining Institute will remember Mr. Brown's courtesy at a meeting of the Institute in Montreal, when a party of members were taken to inspect the partly completed Mount Royal Tunnel, and when later Mr. Brown gave an illustrated description of the engineering problems connected with the driving of this tunnel.

Mr. Brown's death, under such tragic circumstances, and at an early age, will be deeply regretted.



THE LATE ANGUS McDONALD,
Locator of the Gold Pan Mine, N. Man. (Mr. McDonald was killed accidentally a few hours after this photograph was taken).

Our Northern Ontario Letter

THE SILVER MINES

With the price of silver varying between \$1.30 to \$1.35 an ounce, and receiving payment in New York, the silver producing mines of Cobalt are now netting upwards of \$1.40 an ounce for their product. This is due to American money being at such a high premium in Canada. With costs averaging about 55 cents for each ounce produced, the net profit is running high.

During the month of November the Nipissing mine produced an average of \$11,674 every twenty-four hours. The month's production totalled \$350,209. This compares with a total of \$375,247 during the preceding month, at which time the daily average amounted to \$12,105. With a surplus amounting to some \$4,300,000, and with ore reserves some two years or more ahead of current production, the Nipissing appears to be in a position to reap enormous benefit from the current high quotations for silver.

In an interview with Frank L. Culver, president of the Beaver Consolidated, your correspondent learned that the Beaver is now realizing a net profit of from \$2,000 to \$3,000 daily. Mr. Culver stated that some of the ore being encountered at a depth of 700 feet is as rich as any previously taken out of the mine. The writer was shown pieces of almost pure silver, quite flat and almost as large as a man's hand. Perhaps the most significant statement made by Mr. Culver was that it is his intention to begin at the surface and work the Beaver Mine all over again. Recent developments, he said, have tended to show that a large tonnage of ore running from 150 to 200 ounces of silver to the ton has been missed during the course of earlier operations.

The Mining Corporation of Canada is stated to have completed the erection of camp buildings on its recently acquired property in the township of Butt, where it proposes to explore for radium.

A deal is being negotiated this week for the tailings pile located on the Chambers-Ferland Mine. This deal was mentioned a week or so ago in these columns as pending. It is now understood to be practically closed, the purchase being something like \$55,000. These tailings were deposited on the Chambers-Ferland by other mines, and constitutes a Christmas box, so to speak, for the latter company.

Diamond drilling operations have commenced on the Adanae property, D. D. Chisholm of Timmins having taken the contract for driving the first hole from a cross-cut at the 310-ft. level. It is recognized that the hole is being driven more or less against what is generally looked upon as sound geological advice.

The consolidation of the Hargraves and the Reliance properties has been completed. The new company, known as the Hargraves Consolidated, has a capitalization of 2,500,000 shares. Of this, 1,000,000 is going to the former Hargraves stockholders, 800,000 shares going to Reliance owners, and leaving 700,000 shares in the treasury. The latter will be used to finance the operation and work is now being planned. The Lumsden Mine, recently acquired by C. L. Campbell of Montreal, has been de-watered to a depth of

30 feet and Major Rattray is now making an examination, preparatory to outlining a development program.

At a depth of 150 feet on the Crown Reserve an ore shoot has been opened up which compares favorably with the rich veins formerly worked in that mine. According to official advice, upwards of 10,000 ounces of silver was taken out in one round of shots. The pay-streak in the vein has a width of four inches, sometimes widening out to six and seven inches. It is officially stated that the position of the vein offers reason for believing that it may develop into an ore shoot of considerable importance. Should present values continue, a shoot of enormous value would occur in a remarkably small area.

While new discoveries are being made, and interest increasing in a general way in Cobalt, all of which tends to indicate the possibility of increased silver output from the Cobalt mines, the Gowganda silver area is gradually developing into a field of considerable merit. At the leading operations, the scope of work is being enlarged, while among the prospective properties a good deal of activity is apparent, and numerous deals, large and small, are being closed. Among these might be mentioned the Everett property, which adjoins the Castle on the West. This property is being taken over by interests with whom is associated Sir Henry Pellatt. The McAlpine property, in Haultain township, changed hands, the purchaser being John Oliver of Toronto. The Cartwright property at Bloom Lake has also been sold. These and numerous other deals have been made, the details for the greater part being lacking.

Nor is the activity in the silver area confined to Cobalt and Gowganda. It is now becoming apparent in the Maple Mountain district of the Elk Lake mining division, as well as in the township of Corkhill and in various parts of the Elk Lake district proper.

This week a spectacular discovery of silver was made on the Taylor-Kennedy claims situated in the township of Willett, some two miles from the old Lucky Godfrey property. The find has caused a small rush of prospectors to that area.

The belief that quotations for silver will continue high for a number of years, with reasonable prospects of the Elk Lake-Gowganda area being opened up by means of a meter gage railway, is causing interest in that district to increase rapidly.

THE GOLD CAMPS

Gold production in Ontario during the third quarter of 1919 having exceeded any previous quarter in the history of Ontario, ample reason for the utmost optimism is afforded. Nor has the maximum been reached. The indications are that a steady increase will continue for a number of years. This, due to the strong physical condition of the mines as shown by the sum total of the ore reserves blocked out.

The Hollinger Consolidated will disburse another one per cent dividend on December 31st to shareholders of record tomorrow (December 18). This disbursement will amount to \$246,000 and makes a total of seven per cent, or \$1,720,000 paid during the current calendar year. In addition to this a surplus of almost equal amount has been called forward to surplus. The Hollinger has now produced a total of something like \$43,000,000 in its short career, beginning with 1911. Ore blocked out is understood to about equal the total produced during the past eight years. The management is now endeavoring to add another 900 men to the force engaged. Just as soon as this number can be added, the output may be increased close to fifty per cent over the present production.

The Dome Mines continues to treat about 1,000 tons a day and could bring the operation up to full capacity of close to 1,500 tons daily provided another 150 men could be procured. The prospects of getting this additional number of men is growing brighter. On January 15th the Dome Company will disburse a dividend of 25 cents a share, which is looked upon as the beginning of regular disbursements. It is believed that by the end of the company's fiscal year (March 31st) the rate of earnings will approximate \$2.50 a ton and that the mill will be treating an average of about 40,000 tons a month. This would show a net profit of \$100,000—equal to 30 per cent on the issued capital of \$4,000,000 and show a 10 per cent return on shares at \$30 each—the par value being \$10 a share.

The Porcupine-Crown Company is negotiating with the Moneta Company with the object in view of taking over control of that company's property, situated adjacent to the Hollinger Mine, on the west. Provided success attends the present negotiations, the Porcupine-Crown would then proceed with plans to resume production.

The electrically driven mining plant on the Clifton-Porcupine has been installed, and is now in operation. Development work is now proceeding at an increased rate. In a circular recently issued, the management declares that a substantial tonnage of ore of a commercial grade has been put in sight.

The Porcupine-Keora is still calling for tenders for the sinking of a 250-ft. shaft, it being planned to have the work under way early in the new year. Heretofore, the exploration of the property has consisted of diamond drilling operations, during the course of which considerable ore is stated to have been located.

The mill on the Dome Lake Mine is expected to be ready to resume operations about the last week in December. Carl Frank, formerly on the staff of the Dome Mines, is in charge of the Dome Lake.

A Canadian-American syndicate has taken an option on the property of the Ontario-Porcupine Development Company (formerly a part of the holdings of the Buick-Moreng interests). It is planned to carry out exploration work on that part of the holdings situated at the east end of Pearl Lake, and adjacent to the Plenaurum.

Diamond drilling has commenced on the North Woods property, situated adjacent to the old Foley-O'Brien, just outside of the town limits of South Porcupine.

In the Kirkland Lake district, additional operations are being commenced. The Lake Shore during November treated ore from a surface dump, and production amounted only to \$10,246.28. The underground workings, however, have now been de-watered to a depth of 300 feet and current production is from ore drawn from underground. By the beginning of the new year production should be back to almost normal.

The mill of the Kirkland Lake Gold Mines is treating ore at full capacity of 150 tons a day. A record of 173 tons was established for one day. All underground work continue to be favorable. The large ore body as developed at the 600-ft. level has been found to continue to the 700-ft. level, where considerable free gold is present.

The Canadian Kirkland is now equipped with a mining plant and mining operations are being carried forward. The property is under the control of the Crown Reserve Mining Company, and is looked upon as a prospect of more than ordinary merit.

The Ontario-Kirkland is also proceeding with development work, preparatory to blocking out ore in sufficient quantity to warrant proceeding with the installation of a mill in the spring. Directors who recently visited the property have recommended the purchase of machinery and supplies so as to take advantage of the snow roads in the work of hauling the heavy parts to the property.

In the Fort Matachewan district, the leading operation, the Matachewan Gold Mines, has suspended underground work for the time being. It is understood that diamond drilling will be continued.

On the Maloof property at Sesequinika, arrangements are being made to commence exploration by diamond drilling. The work will probably begin about the end of this week. It will be recalled that some years ago a considerable amount of gold tellurides was opened up on surface in this district. The veins were comparatively narrow.

At the Miller Independence Mine, at Boston Creek, the shaft has now passed the 400-ft. level and should reach the 500-ft. level by the middle of January. A working station will be cut at that level and a cross-cut driven for the purpose of cutting the downward continuation of the rich ore body developed near the surface in an incline shaft. In the meantime the power line is being completed, and by the end of January electric energy should be available. This will be followed by the addition of two more machines and progress will be much more rapid. The outlook for Boston Creek is encouraging.

A CORRECTION.

In connection with an item which appeared in the "Journal" of the 3rd December, in which Mr. H. E. Bodine was quoted concerning the "Blue Lead" in Alaska, we are informed by the Director of the U. S. Geological Survey that Mr. Bodine has at no time been employed by the Survey, and that no such accident took place as was reported by Mr. Bodine to have occurred to Mr. S. R. Capps.

A Comparison of Gold and Silver Production in Ontario

Gold Output Likely to Exceed Value of Silver Output by 1920

(By J. A. McRAE)

The official report of the Ontario Bureau of Mines, covering the nine months ended September 30th, corroborates in every way the figures presented from time to time during the period in these columns. The report declares that at the present rate the 1919 output will reach at least \$10,000,000.

In addition to this, it is a fact that the rate of production, since the above report was compiled, has increased considerably and the current rate of output may be conservatively estimated at \$1,000,000 a month. To gage the importance of this, it is of value to turn to the amount produced in the United States, where during the whole of 1918, the output amounted to \$68,646,700. This seems to indicate that Ontario's gold production is now at a rate of about 15 per cent of the total of the United States. Further, that the gold mining industry in this province is new, and is recording rapid growth. In discussing the situation with gold mine operators, the hope is expressed that the 1920 production may exceed \$14,000,000. Compared with this the best previous record was established in 1916 when a total of \$10,339,259 was reached.

During the past thirty-three years, the gold output of Ontario amounted to only approximately \$61,000,000. In order to grasp the importance of the industry as at present, it is interesting to note that of the above total some \$36,542,833 was produced during the five years just ending. It is a fact that the gold output of the province first passed the million-dollar mark in 1912, and it was not until after that time that the industry became one of first-class importance.

Followig is a summary of production during the past thirty-three years, the 1919 figures being based on available reliable figures:

Year	Fine Ounces	Value
1887	327	\$6,760
1888
1889
1890
1891	97	2,000
1892	344	7,118
1893	708	14,637
1894	1,917	39,624
1895	3,015	62,320
1896	5,563	115,000
1897	9,157	189,294
1898	12,862	265,889
1899	20,394	421,591
1900	14,391	297,495
1901	11,844	244,837
1902	11,118	229,828
1903	9,096	188,036
1904	1,935	40,000
1905	4,402	91,000
1906	3,202	66,193
1907	3,212	66,399
1908	3,212	66,389
1909	1,569	32,425
1910	3,089	63,849
1911	2,062	42,625
1912	86,625	1,788,596
1913	219,801	4,543,690
1914	268,264	5,545,509
1915	406,577	8,404,693
1916	497,836	10,339,259
1917	420,894	8,698,881
1918	450,000	9,100,000
1919 (est)	500,000	10,500,000
Totals	2,973,411	\$61,373,887

In the gold mining areas, chief among which is Porcupine and Kirkland Lake, there is manifest a degree of enthusiasm not shared by many other gold mining areas in the world. The reason for this is that the average grade of the ore is high, and even at present high costs leaves a margin of around fifty per cent net profit. Accordingly as the forces engaged increase, the cost of operation is becoming more favorable. The Hollinger is endeavoring to add at least 900 more men to its force, the Dome another 150 men, with a corresponding demand for additional men at the other producing mines.

Two other facts, more or less of uncertain quantity, but, nevertheless, having a favorable influence, are the high rate of exchange between Canada and the United States, together with the strong agitation in America for a bonus on new gold. Large financial interests in the Estates are now known to be accumulating a large amount of shares in the leading gold mines of Northern Ontario. In doing this they get the benefit of the rate of exchange, which, at the time of writing has reached about eleven per cent. On such shares as the Dome Mines, a saving of about \$1.50 a share is made at the outset. As to the agitation for a bonus on new gold, it is exceedingly significant to note that the American Bankers' Association as well as the American Mining Congress are urging the United States Government to pay \$10 an ounce for newly produced gold. That these factors will attract added attention to the gold mining companies of this country appears to be certain.

The gold mines are all well stocked with coal. Cyanide is procurable at a reasonable price and the cost of labor is quite reasonable. Taking all factors into consideration, the opinion of leading mining men has taken a decidedly optimistic turn to the end that during 1920 the gold output of this province may exceed the value of the silver output of Ontario.

PORT ARTHUR NOTES

(By J. J. O'CONNOR)

A serious accident occurred on the 8th instant, at the Northern Pyrites Mine, at Northpines, Ontario, which caused the death of two men, and some damage to the plant caused by the explosion of the compressed air container.

Mr. W. A. Bartlett, Inspector of Mines for the Province of Ontario, is in the city today, on his way to Dryden, Ontario, to make a complete inspection of the mine and workings of the Wachman Mining Company's operations at Contact Bay, Vermillion Lake. On his return he will make an inspection of the Federal Mining Company's silver property, in Paipoonge township, about three miles from the Rabbit Mountain Mine.

Mr. Bartlett is the discoverer of the Bartlett and Magpie iron mines, in the Michipicoten district.

Nova Scotia Notes

Cape Breton Coal Mines.

Production of coal has improved, as is the rule in the weeks immediately preceding the Christmas holidays. On one day in the week ending the 13th December, the Cape Breton collieries of the Dominion Coal Company produced the largest day's output since April 1918, namely 12,558 tons. This figure represents about two-thirds of a fair day's production for the same mines before enlistments withdrew the producers from the mines.

Apart from weather delays, it may be expected that the Dominion Coal Company's mines in Cape Breton will work steadily throughout the Winter months. Something like the normal shipping fleet of the Company should be available for water transportation next Summer, and it may be anticipated that the policy of the Company will be to stock coal during the Winter, in the intervals of loading shipping, so as to be prepared to send coal to Montreal next Summer, and regain some part of the previous Montreal custom.

A number of Conciliation Boards have been appointed to adjust the wages question outstanding between the various U. M. W. locals and the several coal companies. There seems no reason to anticipate any difficulties in the way of settlement, and if satisfactory arrangements can be come to between the parties, it may be possible to make a wage agreement over a term of one year. It is also possible that in the case of the Glace Bay collieries that an agreement may be come to between the Dominion Coal Company and its workmen without the actual formal intervention of the Board of Conciliation.

Pictou

The official announcement of the acquirement of control of the Acadia Coal Company by the Nova Scotia Steel and Coal Company is the most interesting piece of news that has recently been given out in this district.

The Pictou coalfield is a difficult one to understand, but it is a field of much promise. During the administration of the Belgian interests, which the Scotia people have now taken over, the property of the Acadia coalfield was more thoroughly and more scientifically prospected than it had ever been previously, and Mr. Notebaert, the Mining Engineer of the Acadia Company, has proved himself to be a mining engineer of exceptional skill. It is not too much to say that the property of the Acadia Coal Company, as it has been taken over by the Scotia Company, was never in its history in better condition, more developed, or as thoroughly understood in its structural relations to the main coalfield. The capital which the Belgians invested in the Acadia properties has been invested to the permanent benefit of the Pictou coalfield, and the Belgian management did unusually good work in a coalfield of extraordinary complexity. The number of coal seams already proved in the Stellarton area controlled by the Acadia Coal Company is sixteen, but there is very reasonable possibility that others may be encountered at lower depths. Another undeveloped asset of this field is the oil-shales and oil-coals which are associated with the coal seams in much profusion. The Stellar, or Oil Coal seam (from which the town of Stellarton is named) is a case in point.

Commenting in this connection, Mr. F. W. Gray's

Bulletin (Mines Department Bulletin No. 14 states:

"The coal companies are more interested in the distillation of oil shales than is perhaps realized, because not only do the oil shales occur within the mining areas of coal companies now operating in Nova Scotia, but these companies have also access to large quantities of inferior coals, coaly shales and screenings, which, at some future date may, very conceivably, be found to yield a sufficient percentage of hydro-carbons to justify the extraction of these."

It should not be forgotten that the Scotia Company itself was formerly an operator in the Pictou field, and that it still holds leases which can be advantageously linked up to the Acadia holdings.

New Brunswick.

The publicity that has been given to the Minto strike is extraordinary, considering its relative importance. Every Canadian newspaper from East to west has had headlines about the strike at Minto, N.B., and very few of those who read the dispatches knew that the strike involved not more than one hundred men all told. So far as it is possible to gather from the newspapers, the award of the Conciliation Board does not seem to have been marked by any striking ability, and it would seem that both locally and abroad too much importance has been attached to a trouble that presented no very grave issues, and from which neither side and anything to gain by such disproportionate publicity as has been given to this storm in a teacup. The coal-mining industry at Minto is small, and can never be very much bigger because of the limited character of the coal deposit, but it is of much local importance because the single thin seam worked in New Brunswick is an isolated patch of coal some hundreds of miles distant from the nearest coalfield. The Minto people should have enough sense to compose their own differences, and take advantage of the purely local market that is all their own. Moreover, the Minto miners have mostly been brought in from the outside, with some considerable difficulty and expenditure of money, and they will not easily be replaced if they scatter. Mutual interest should have dictated a more conciliatory policy on the part of all the parties concerned, because, to the rest of Canada, despite the tremendous publicity given to this strike, whether the Minto mines work or not is a matter of relative non-importance.

THE CONVOY PORTS OF HALIFAX AND SYDNEY

"World's Work" for December contains the first of a series of articles by Rear Admiral Sims, U. S. Navy, in which are contained some interesting references to the use of Sydney and Halifax, Nova Scotia, as ports of assembly and departure for merchant-ship convoys.

To those whose good fortune it was to witness the periodical gathering of the fleets of dazzle-painted ships in Sydney Harbor and Bedford Basin, Admiral Sims' recital will call up interesting memories, and it is worthy of note that during nearly five years of war the shipping of coal and steel proceeded virtually without interruption.

As Admiral Sims states, once the convoy system was properly organized, the arrival and departure of the conveying warships proceeded with the regularity of a train service.

Special Correspondence

BRITISH COLUMBIA

Vancouver, B. C.

A company, with a capitalization of \$10,000,000 is proposed for the purpose of undertaking in British Columbia the establishment of the plant necessary to smelt and refine all the ores produced in the Province. The enterprise would involve the erection of smelters for treating copper, silver-lead and zinc ores, producing the refined metals ready for the market, and supplying alloys of the same. It also would include the launching of a commercial iron and steel plant. It is understood that the project is to come before the Vancouver Board of Trade and that, in all probability, the government will be asked to provide some form of encouragement and support.

The Talpoppin Mining Company, organized in Vancouver and of which A. Wallace, a well known businessman in president, is said to have property of much promise on Burns Lake in the Omineca District. Report, which must be considered authoritative, are to the effect that there are several well defined veins carrying high silver values. The claims, however, are little known as yet to any outside those immediately interested. The latter propose carrying on development without delay and have proceeded with the construction of a road to facilitate transportation.

That he has negotiated the transfer of 16,000 acres of oil lands on the Athabaska River, northern Alberta, acquired from the Dominion Government last year, to a financially strong Eastern American Syndicate, is the statement made by Charles F. Law, of Vancouver, on his return recently from Boston and New York. This field is said to have been first explored by Sir John Richardson, of the Franklin Expedition, and a map with geological notes were deposited with Earl Bathurst, who then was Colonial Secretary. A sample of the tar sands exposed on the Athabaska River was taken to Boston and analyzed by Arthur Little & Co., chemists, and found to contain oil to the amount of 25 per cent to its cubic contents. The tar sands average 100 feet in thickness. It is generally believed that drilling back of the Athabaska River, where the covering of the sands is several hundred feet thick, will result in the finding of petroleum of high grade. Geological notes from Sir John Richardson's report, prepared over a century ago, are given as follows:

"About nineteen miles below Fort McMurray and a mile from the right bank of the river, a saline spring occurs. This spring rises from the summit of a rounded hill which is about fifty-six yards in diameter, sixty feet high, and entirely encrusted with salt deposits. This hill is bounded on three sides by the high bank of the river, which here recedes a little and forms an even round backed ridge, rising two hundred feet above the spring. A small clayey plain on the southwest side of the hill is traversed by the rivulet from the spring and opens into a bay of the river. The rock exposed is limestone.

"At a considerable distance from Calumet a limestone similar to that last mentioned occurs, having its strata waving or dipping both to the east and west. Below this there is a peaty bog, whose crevices are filled with petroleum.

"This mineral exists in great quantities in this district. We never observed it flowing from the limestone but always above it and generally agglutinating the beds of sandstone into a kind of pitchy sandstone. Sometimes fragments of this sandstone contain so much petroleum as to float downstream. The limestone dips under the water and disappears at Calumet and the pitchy sandstone cliffs also terminate there. This spot, situated about three or four miles below an old fort, obtains its name from a bed of compact marl which form a small cliff on the bank of the river and is quarried by the voyageurs for making calumets or pipes."

Hazelton, B. C.

After visiting the Silver-Standard Mine it is stated by General J. W. Stewart, who is one of the chief owners and who returned from active service in France only a few months ago, that development at greater depth will be undertaken without delay. He says that there is no doubt that he and his associates have a mine and, if expectations are confirmed by the work proposed, it will become one of the largest producers of the Province. The Silver Standard Mine has been opened up and proven to a depth of 250 feet on what was previously known as the main vein and to a depth of 125 feet on No. 4 vein. The ore as a rule is high grade but of a somewhat complex nature, requiring a little different treatment from the usual run of silver-lead ores. The proper treatment, however, after considerable research, has been established. General Stewart states that it has been realized that development at greater depth is necessary and plans have been considered with the result that it has been decided to run a new crosscut, which will be about 900 feet long to cut the No. 4 vein at a depth of 200 feet. The No. 4 is the new vein which has proven a valuable ore producer. There is considered to be no reason why that ore shoot should not extend to the lower level and if it does the Silver Standard will be definitely established. When the tunnel reaches No. 4 vein a drift will be run in both directions and the tunnel then will be continued on the original main vein, cutting the latter at a depth of 250 feet. Thus the ultimate length of the tunnel will be 1500 feet. The new tunnel also will cut No. 1 vein at a depth of 100 feet, although a drift to the south probably will be necessary to get under the shoot. Up to the present No. 1 has received nothing more than a little surface development but assay returns from its ore are satisfactory. Nos. 2 and 3 veins also will be cut. The tunnelling will be done by contract. In connection with this work a 400-foot surface tram connecting the upper workings with the tunnel will be installed for the purpose, in the meantime of conveying supplies, and later for the transportation of ore. It is not the intention to make any improvements to the power plan and mill at present but when the plans outlined are complete the entire equipment will be remodeled.

Prince Rupert, B. C.

Twelve mining claims have been staked on a gold-bearing ledge extending from Lisianski Inlet to Stag Bay on Chicago Island by J. H. Cann and associates of Prince Rupert. It is stated that casual samples, taken at intervals of twelve feet along the ledge, give returns averaging \$239.95 to the ton.

Kamloops, B. C.

Interests held by Messrs W. H. and G. J. Hammond in the magnesium sulphate deposits at Basque B. C., have been disposed of to eastern capitalists, \$125,000

being the sum mentioned as having changed hands in the transaction. Referring to this property, which has been held and to some extent operated by the Basque Chemical Production Co., Limited, the Minister of Mines Report for 1918 quotes Charles A. Newhall, of Seattle, Wn., in part as follows:

"The examination was made on the lakes on March 8th. Considerable snow was on the ground and it was impossible to form an exact estimate as to the extent of the salts, in that we could not distinguish between the mud and the salts. In general the formation of these lakes is similar to the ones that are being worked in the district tributary to Oroville, Wn. The salts occur in pools of varying shapes and sizes; these pools being surrounded by mud-rings. The excavations made on the lakes indicate that the pools carry layers of salt to a total depth of approximately 20 feet, the salts lying in layers and intermixed with mud. These pools are more or less conical in shape, tapering off towards the bottom. In other words the greatest area is exposed at the surface. Mud to varying depths lies between the pools, and this mud in other lakes has always been found to carry more or less salts."

A number of samples were taken by Mr. Newhall, the result of the assay of one being as follows:

	Sample No. 1
	Per cent.
Insoluble matter.....	0.76
MgSO ₄	44.58
Water.....	50.84
Other soluble solids.....	3.82
	99.24
Epsom equivalent to MgSO ₄	91.24

Several carloads of the product already have been shipped to Eastern Markets, where the demand, evidently, is gratifying. The force employed recently was increased and, with the change in management, it is stated that the facilities for increasing the output materially are to be provided.

The deposits are situated in the Dominion Government Railway Belt, only a short distance from the main lines of the Canadian Pacific Railway and near the Cariboo Road between Spence's Bridge and Ashcroft. The property includes five lakes.

Nelson, B. C.

The Utica Mine of the Ainsworth Division has not been operated for some time but T. J. Poyntz, formerly superintendent, has not lost faith in the property. Working a portion of the old workings he recently made a strike of high grade silver-lead ore and now is soaking a quantity of the best for shipment. It is not unlikely that some action will be taken to develop this mine further as it is the opinion, in well informed quarters, that it has not been exploited to the limit of its possibilities. The Minister of Mines Report of 1918 shows that the Utica was operated for three months in that year, that 222 tons of ore were shipped, and that tonnage yielded 13,661 oz. silver and 10 tons lead.

Hon. John Hart, provincial minister of finance, was requested, while in Nelson recently, to submit legislation to the Provincial Legislative Assembly at its next Session, providing for the amendment of the Taxation Act in such fashion as to grant a more liberal

form of relief to operators of gold mines. Under the Taxation Act of 1918 a gold mine is deemed to be a mine whose gold recoveries amount to 85 per cent or more of the total value of the metal content of the ore. Mines coming within this classification are exempted from the 2 per cent tax on output in recognition of the unfavourable condition of gold in the market. Representations were made to Mr. Hart that it was at the time of the enactment of this legislation that the position of gold now is more unfavourable and that the advance in silver made it difficult for any gold property having even a very small proportion of silver in its ore values to come within the 85 per cent definition. It was stated as an example that \$17 gold ore, containing even 2½ ounces of silver at the present price, fell outside the exempted category, yet the property was essentially a gold property. It was held, as a matter of fact, that very few purely gold properties can operate under present conditions. Mr. Hart was requested to revise the definition of a gold property downward, in order that the class of properties it was intended originally to benefit might come within the classification.

Trail, B. C.

Fire destroyed the copper mill of the Trail Smelter, Consolidated Mining and Smelting Co., Ltd. of Canada, recently and the company, losing no time, now has the necessary repairs in hand. It is announced that the misfortune does not necessitate the suspension of copper ore shipments to Trail for treatment. The lead mill is being re-arranged and, pending the completion of the new copper mill, copper ore will be crushed at the lead mill. The latter, of course, also will take care of lead ore.

Ore receipts in gross tons for the week from November 15 to 21 inclusive at the Consolidated Mining and Smelting Co.'s Smelter, Trail B. C. totalled 4,648, the aggregate tonnage for the year to date being 289,816. Of the independent shippers the chief contributors were: Florence, Princess Ck., 153 tons; Josie, Rossland, 318; Mandy, Le Pas, Manitoba, 156; Paradise, Athalmar, 41; Rambler-Cariboo, Rambler, 52; Standard, Silverton, 199; Van Roi, Silverton, 41; and Whitewater, Ratalack, 40. The Centre Star Mine, Rossland, was the principal shippers of the company properties with 1876 tons while the Sullivan Mine, for the first time for weeks, shows a shipment of 259 tons of zinc ore. This, however, does not mean that the strike is at end.

Stewart, B. C.

That the first shipment of ore from the Premier Mine still is at Hyder, Alaska, awaiting shipment is the statement of P. Daly, who took it out under the terms of a lease he had from O. B. Bush in 1915. He was working the property then on a royalty basis. The ore was sledged to tidewater. Mr. Daly says that there are about eight tons which assays around \$200 a ton. He will send it to the smelter as soon as transportation is obtained.

There is no doubt of the sentiment of mining men who have visited the various camps in the Salmon River section as to their future. Without exception they are enthusiastic. Dr. M. W. Bruner, who has just returned, describes it as the most wonderful mineral belt he has ever seen and looks forward to seeing a railroad constructed up the Salmon River. Charles F.

Caldwell, the well-known British Columbia operator anticipates much development in the Spring and states that the mine owners propose tackling and solving the transportation problem.

Alice Arm, B. C.

Major A. W. Davis, the mining engineer who has had charge of the operations of the Dolly Varden Mine, has left the employ of the Taylor Mining Company and has gone into private professional practice in Vancouver, B. C.

The Dolly Varden Railroad has been closed down for the Winter, the locomotives and rolling stock being placed in roundhouses where they will be overhauled preparatory to the new year's work.

Operations at the Mine will be continued through the Winter so that when the railroad is opened there will be a large quantity of ore on the dump for shipment.

Communications will be kept open for the distance of 17 miles between tidewater and the Mine by means of dog teams.

Nelson, B. C.

While the output of the East and West Kootenays may not be as great this year as last it is the opinion of Fred. A. Starkey, secretary of the associated Boards of Trade of Eastern British Columbia, that the mining industry has never been more active or given such promise of sound development.

Referring to the Sandon District he points out that the ore body recently discovered on the Silversmith Property carries high values and is said to be most important. The development of the Noble Five and the Reco, and the erection by the operating Company of a 1500-ton Mill, are mentioned as incidents of a gratifying nature. He speaks, also, of Clarence Cunningham's new mill, which is running at full capacity treating the ore of the Queen Bess, Sovereign, Wonderful and the Alama-Idaho Mines. The Canadian, Adams, and Ivanhoe Groups as well as the Surprise and Bosun are being vigorously developed by the Roseberry Surprise Mining Co.

Mr. Starkey mentions as being under development and as having, in some cases made shipments, the McAllister, Ocean, Van Roi, Silverton, Enterprise, Neepawa, Molly Hughes, Black Prince, Ottawa and Evening Star, The Standard, it is explained, is being further opened up and has been shipping zinc concentrates.

In the Kaslo District the Cork Province has been reorganized in order to raise finances for further development of large ore bodies at depth; also to acquire more water power which is needed for the milling plant. The Silver Bell, Index, Gibson, Flint and other properties are also under development. All these are new prospects opened within the last eighteen months. The Old Blue Bell, the oldest mine in the Country, the Ainsworth, Florence No. 1 and several others have been shipping.

The same rate of progress is being made in the Lardo District, where the White Water, Comstock, Bannockburn, Bullock, Silver Cup, Tenderfoot and others are expected to be among next year's shippers. Sheep Creek is well ahead with development and the Queen and Nugget are getting close to the point at which it is expected to encounter the main vein at depth. The cross-cut which was made in the former mine and which went through schist is only now 400 or 500 feet from the quartz.

The East Kootenay has shown marked improvement, the North Star, Paradise, Victor and several others having made shipments.

Slocan, B. C.

The Silver Glance Property, Bear Lake, has been bonded and will be developed quite extensively by the new owners. The vein is in granite and is a true fissure about 25 feet in width, coursing north and south, dipping about 60 degrees to the East. Two heavy guage seams are on foot and hanging walls, the territory between being crushed granite cemented with quartz, which carries the values. Compressed air will be used in development and it is planned erecting a mill to treat the ore by flotation.

Owners of the Index Mine have acquired the Flint Claim, on which some development has been done with satisfactory results, the consideration being about \$22,500. The Government Mining Engineer in 1817 reported that "a nice showing of one foot of solid ore averaging 100 oz. silver and 65 per cent lead" had been opened up. Since then some work has been done. It is understood that operations are to be carried on through the Winter.

Vancouver, B. C.

Maurice D. W. Bacon, of Los Angeles, Cal., has filed suit in Spokane, Wn., against B. K. Neill, of Spokane, for a half interest in the Premier, formerly the Bush Mine situated near Stewart, B. C. It is asserted by Mr. Bacon that a partnership existed between him and Mr. Neill; that the value of the Bush Mine, as it then was termed, was misrepresented to him and that Mr. Neill thus obtained possession. Mr. Neill states that there is no foundation for the claim made.

Since the report of a large deposit of limonite ore being found on Whitewater Creek, Lillooet District, there have been inquiries and press announcements which, while not of a definite character, indicate that interest has been roused in the possibility of establishing an iron and steel industry.

Requests for information as to the extent of the deposit referred to, and as to the magnetites of the Coast, have come from various sources. English capitalists, mining men interested in the Orient who state that, owing to unfavorable conditions there, they might be induced to move to British Columbia if reasonable encouragement were given, and Provincial financiers have been sending out feelers and compiling data as to the prospects. In short it would appear now that, should the investigations that are to be initiated in the Spring in connection with the Whitewater Creek ores, prove satisfactory the commercial development of this deposit will follow.

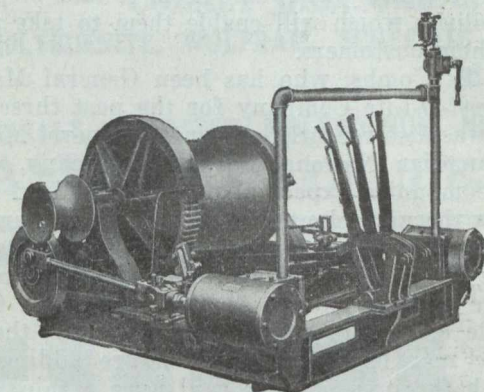
As an instance Percy Scott Leggatt, director of Thomas Summerson & Sons, railway owners and car builders of Darlington, England, is quoted as stating that his firm is considering launching an iron and steel industry here. His firm is interested in smelters and refineries in England.

Mr. Leggatt evidently is satisfied that the ore necessary is available. He seems to be impressed with the possibilities of the electric furnace but says a first necessity is cheap power supply.

Experts have been conducting experiments with iron ore samples from different parts of the world on behalf of Summerson & Sons and the specimens from British Columbia, and especially those from Texada Island, are said to be suitable.

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Victoria, B. C.

The oil possibilities of territory within the Peace River District, and adjoining Dominion Lands in the same area, are declared to warrant further investigation by Hon. T. D. Pattullo, Minister of Lands, in the British Columbia Government. Mr. Pattullo's statement is based on the report of Professor J. C. Gwillim, who conducted a party into the Country in question last Summer on behalf of the Government, an appropriation of \$50,000 having been made to permit of inquiry being made into the resources of the Peace River Section in respect of coal, petroleum, and natural gas. It is likely that a larger sum will be asked for at the forthcoming session of the legislature to permit the work to be continued.

The Standard, the Shell and the Anglo-Canadian oil companies are showing strong interest in the oil fields of the Great Slave Lake and Peace River District of the Canadian Northwest. Representatives of the Anglo-Canadian Company who are in Ottawa believe that there will be important developments in reference to oil production in the next few years.

A large movement of prospectors, well equipped for their work, is predicted into the northwest with the opening of navigation on the northern waterways. Anticipating this mounted police posts are being established.

The Standard Oil Company and the Anglo-Canadian Company are understood to have secured leases covering considerable tracts of oil lands in the vicinity of Great Slave Lake. The former will send two outfits and the latter one to the ground to make tests.

The Shell Oil Company is understood to have sev-

eral survey parties at work in possible oil fields situated in the Province of Alberta.

Princeton, B. C.

The property of the Princeton Mining and Development Company, situated on the Similkameen River about four miles from Princeton, is to be re-opened. A bunkhouse is under construction and early in the Spring a compressor is to be installed, after which drilling will start. Work done so far has given satisfactory results, a carload of copper ore shipped last summer having encouraged the owners.

Trail, B. C.

Ore receipts in gross tons for the week from November 21 to November 28 inclusive at the Trail Smelter of the Consolidated Mining and Smelting Co. totalled 7,708 tons. The chief independent shippers were the Alamo, Alamo, 107 tons; the Josie, Rossland, B. C., 721 tons; the Mandy, Le Pas, Man., 156 tons; the north Star, Kimberley, 316 tons; the Standard, Silverton, 403 tons. Of the company's properties the main contributories were the Centre Star, Rossland, 2907 tons; the Emma, Eholt, 479 tons; the St. Eugene, Moyie, 1507 tons; the Sullivan, Kimberley, 858 tons.

WANTED—A competent man with experience covering the principal departments of electrolytic copper refining. Must be prepared to go to Europe if necessary. State terms in application, also experience in design construction and operation, giving references. Mark envelope "Application" and address to W. J. Forrester, Imperial Bank Chambers, Leader Lane, Toronto.

NEW PLANT OF CANADIAN NATIONAL CARBON COMPANY AND THE PREST-O-LITE COMPANY UNDER ERECTION IN TORONTO.

The Canadian National Carbon Company, Limited and the Prest-O-Lite Company of Canada, Limited have jointly purchased the westerly ten acres of the property at the south west corner of Bathurst and Davenport Road in the City of Toronto, known as the Hillcrest Driving Park, as a site for a large new manufacturing plant.

The Canadian National Carbon Company are manufacturers of the well-known Columbia and other dry batteries, Cilumbia storage batteries, Eveready "Day-lo" flash lights, Carbon brushes for electrical machinery, Electrodes, etc.

The Prest-O-Lite Company of Canada, Limited are manufacturers of the Prest-O-Lite storage battery, Prest-O-Lite welding and cutting apparatus, Pest-O-Lite Dissolved Acetylene, Prest-O-Lite gas tanks, lamps and other automobile lighting and starting accessories and apparatus.

The new plant which is to be erected in Toronto at once is the largest manufacturing establishment erected in Toronto for several years and will consist of two buildings, one of which will be 80 feet wide by 400 feet long, two storeys high with one section 80 x 80 three storeys high, to be occupied by the Canadian National Carbon Company, Limited while the second building for the Prest-O-Lite Company will be 80 feet wide by 400 feet long and two storeys high.

The heating plant will be housed in a separate structure, 50 x 60 and will have room for installation of additional boilers for future units to be added.

All the buildings will be of re-inforced concrete frame, flat slab floors, mushroom type columns on twenty-foot centres, steel sash and brick curtain walls.

Each building will have two freight elevators and all toilet accommodations and stairways will be contained in towers erected on outside of buildings, thereby removing any obstructions which might interfere with manufacturing operations.

Arrangement is provided for special rest rooms for female employees, shower baths, a dispensary with competent medical attendant to look after any injuries to employees; restaurant with modern, equipped kitchen in charge of a competent Chef where meals will be cooked and served to employees at bare cost. In fact, both companies propose to make the new plant by removing any obstructions which might interfere the owners but for its employees

The plant will be served by two switch tracks operated under a joint agreement between the Canadian

Pacific and the Canadian National Railways.

It is expected that the plant will be ready for occupancy in May 1920 and everything possible will be done to get it ready by that time.

At the present time the two companies are operating five plants at different locations in Toronto but owing to the large demand for their goods have been unable to fill orders for some time past and propose now to get facilities which will enable them to take steps now to get facilities which will enable them to take proper care of their customers.

Mr. R. H. Combs, who has been General Manager of the Prest-O-Lite Company for the past three years and who was also recently appointed General Manager of the Canadian National Carbon Company, states that his companies expect about five hundred people as soon as the new plant is ready to operate and that the facilities provided by these first two units will take care of upwards of 700 employees if needed. "We have secured enough ground" says Mr. Combs, "to enable us to put up six such units as the two which are now being built but before adding new units, both the present units will have a third storey added, as the buildings are being erected to carry three full floors."

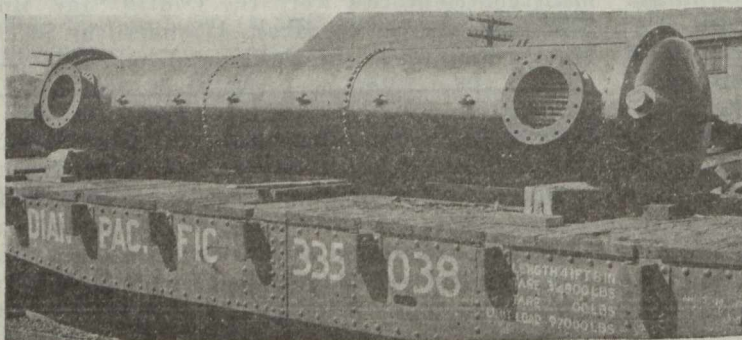
In addition to the large plant described above, Mr. Combs states that the company will erect in the Spring, a new acetylene gas plant in Toronto or immediate vicinity, to take care of the greatly increased demand for compressed Prest-O-Lite gas for welding and cutting and that a large new storage battery warehouse and assembly plant will be erected at Winnipeg.

The contract for the large Toronto plant has been awarded to Messrs Wells & Gray, Limited, of Toronto, a purely local, Canadian Company, who have in the past few years executed some very large contracts for large American and Canadian Companies, such as the Wm. Davies Co.; Canadian Pacific Railway and H. Walker & Son, two of their notable jobs being the large plant of the Ford Motor Co., Ltd., at Ford, Ontario, and the large new plant of The Peters Cartridge Company at Cincinnati, Ohio, where they gave a rare demonstration of Canadian aggressiveness in the construction of a great plant in record time right in the midst of big American contractors who tried hard for the contract.

WANTED.

CHEMIST, American, desires position. Several years experience in blast-furnace work, besides steel, ores, electrolytical processes, food products, etc. Best of references. Box 3, Canadian Mining Journal, Garden City Press, Ste. Anne de Bellevue, P.Q.

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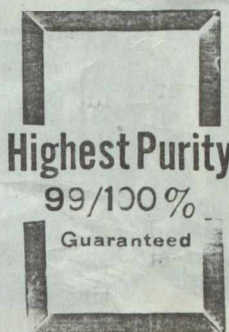
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300	275/300	750	435	2300 750
2-300	500	500	550KW	6600 500

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30	125	850	50	550	860
35	120	850	50		850
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75	2200			220	
75	110		100	550	
80	220	720	120	440	720
100	125/250	870	150	2300	870
100	550	580	150	2200	580
100	250	1200	150	2300	
102/510	60/300			550	700/720
150	500/550	600	200	440	
150	125/250		200	220	580
150	230/275	571	200	2080	
200	125		250	2200	450
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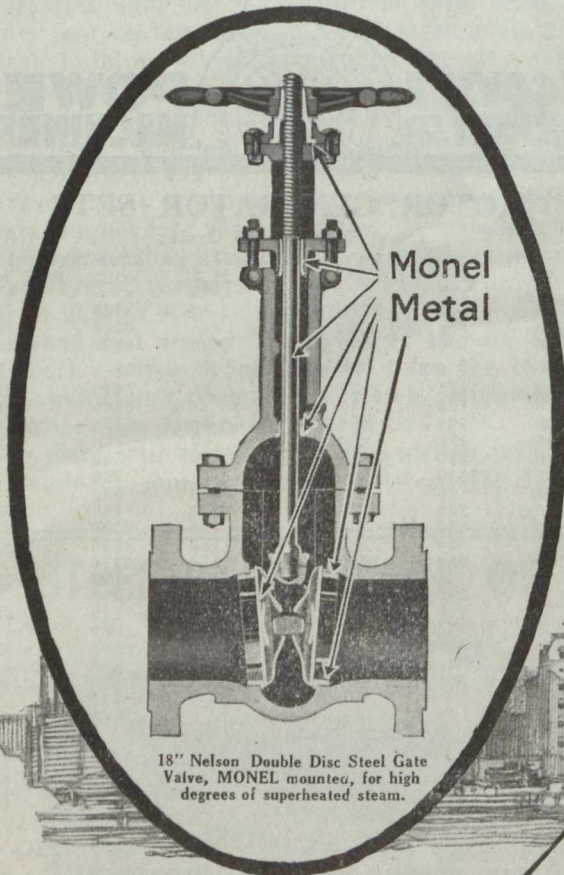
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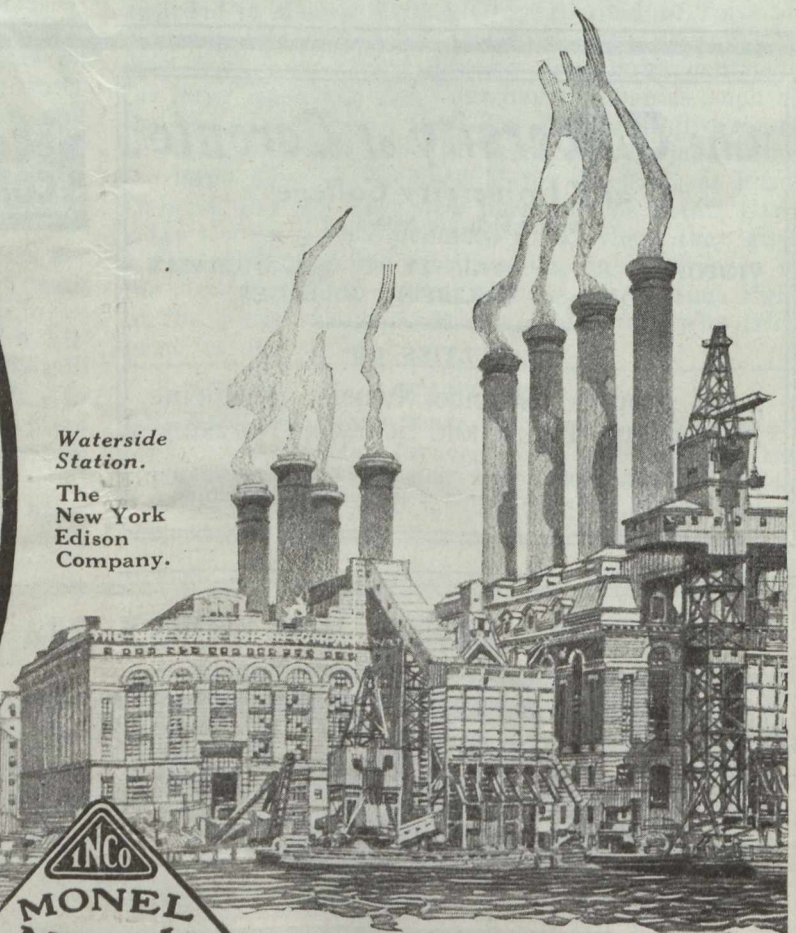
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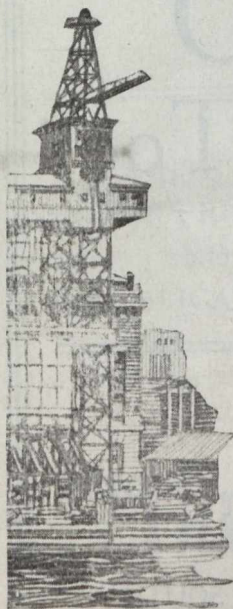
Bronze stems for controlling valves on the main turbines corroded and scaled, and had to be replaced in 2 or 3 years. Steel stems lasted but a short time. MONEL Metal stems were tried and after two years' service show no wear or corrosion and are good for many more years.

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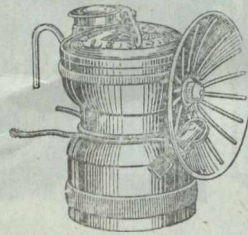
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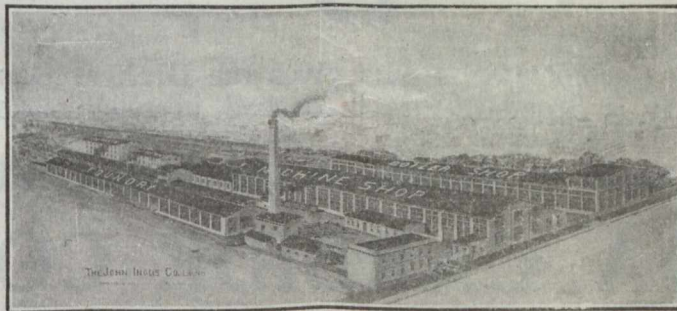
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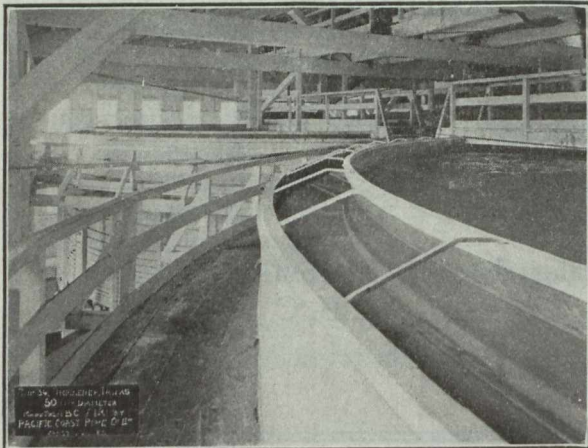
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AT

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Agitators:

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Air Hoists:

Canadian Ingersoll-Rand Co., Ltd.
Mussens, Limited.

Alloy and Carbon Tool Steel:

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International High Speed Steel Co., Rockaway, N.J.

Alternators:

MacGovern & Co.

Amalgamators:

Northern Canada Supply Co.
Mine and Smelter Supply Co.
Wabi Iron Works.

Antimony:

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Antimonial Lead:

Pennsylvania Smelting Co.

Arrester, Locomotive Spark:

Hendrick Manufacturing Co.

Arsenic White Lead:

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Dominion Engineering & Inspection Co.
Lymans, Limited
Mine & Smelter Supply Co.
Pennsylvania Smelting Co.
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Assayers and Chemists:

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Campbell & Deyell
Ledoux & Co.
Thos. Heys & Son
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Everitt & Co.

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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.

Rabbit 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:

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Link Belt Co.
The Mine & Smelter Supply Co.
Northern Canada Supply Co.
Jones & Glasco.

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Goodyear Tire & Rubber Co.

Belting (Elevator):

Goodyear Tire & Rubber Co.

Belting (Conveyor):

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Mussens, Ltd.
Northern Canada Supply Co.
Canadian Explosives, Ltd.

Bluestone:

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Blowers:

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MacGovern & Co., Inc.
Northern Canada Supply Co.
Fraser & Chalmers of Canada, Ltd.

Boilers:

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Marsh Engineering Works
MacGovern & Co., Inc.
R. T. Gilman & Co.
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The John Inglis Company
Wabi Iron Works.

Blue Vitriol (Coniagas Red):

Canadian Fairbanks-Morse Co., Ltd.

Bortz and Carbons:

Diamond Drill Carbon Co.

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Northern Electric Co., Ltd.

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Cages:

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Mussens, Ltd.
The Wabi Iron Works

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Canada Wire & Cable Co.
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Mussens, Limited
R. T. Gilman & Co.
The Wabi Iron Works
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Burnett & Crampton
Hull Iron & Steel Foundries, Ltd.
John J. Gartshore
Marsh Engineering Works, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works
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- Castings—Brass**
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- Castings (Iron and Steel)**
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Canadian Steel Foundries, Ltd.
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The Electric Steel & Metals Co.
The Wabi Iron Works
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Hadfields, Limited
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The Electric Steel & Metals Co.
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Burnett & Crampton
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Sullivan Machinery Co.
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Coniagas Reduction Co.
Everitt & Co.
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Canadian Ingersoll-Rand Co., Ltd.
Northern Canada Supply Co.
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Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
The Mine & Smelter Supply Co.
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MacGovern & Co., Inc.
Mussens, Limited
R. T. Gilman & Co.
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Northern Canada Supply Co.
MacGovern & Co., Inc.
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Consolidated Mining & Smelting Co.
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Canadian Fairbanks-Morse Co., Ltd.
Link-Belt Co.
R. T. Gilman & Co.
Smart-Turner Machine Co.
M. Beatty & Sons, Ltd.
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Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
Hardinge Conical Mill Co.
The Electric Steel & Metals Co., Ltd.
R. T. Gilman & Co.
Lyman, Ltd.
Mussens, Limited
Mine and Smelter Supply Co.
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Canadian Miners' Buying Directory.—(Continued)

Cyanide Plant Equipment:

The Dorr Co.

D. C. Units:

MacGovern Co.

Derricks:Smart-Turner Machine Co.
M. Beatty & Sons, Ltd.
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.
M. Beatty & Sons
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.
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., Rockawaw, N.J.
Mussens, Limited**Drill Steel Sharpeners:**Canadian Ingersoll-Rand Co., Ltd.
Northern Canada Supply Co.
Sullivan Machinery Co.
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.
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:**M. Beatty & Sons
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.
Fraser & Chalmers of Canada, Ltd.**Engines—Gas and Gasoline:**Canadian Fairbanks-Morse Co., Ltd.
Alex. Fleck
Fraser & Chalmers of Canada, Ltd.
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.
Marsh Engineering Works
Fraser & Chalmers of Canada, Ltd.**Engines—Marine:**Canadian Fairbanks-Morse Co., Ltd.
MacGovern & Co., Inc.**Engines—Steam:**Canadian Fairbanks-Morse Co., Ltd.
M. Beatty & Sons
R. T. Gilman & Co.
MacGovern & Co., Inc.
Fraser & Chalmers of Canada, Ltd.**Engineers:**

The Dorr Co.

Ferro-Alloys (all Classes):

Everitt & Co.

Feed Water Heaters:

MacGovern & Co.

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:**M. Beatty & Sons
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:**
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.
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.
- Hoists—Air, Electric and Steam:**
Canadian Ingersoll-Rand Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Jones & Glassco
M. Beatty & Sons
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.
M. Beatty & Sons
Marsh Engineering Works
Fraser & Chalmers of Canada, Ltd.
The Mine & Smelter Supply Co.
- 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.
- 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 & Glassco
- 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
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.
- 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.
International High Speed Steel Co., Rockaway, N.J.
- Mining Requisites:**
Canadian Steel Foundries, Ltd.
Dominion Wire Rope Co., Ltd.
Hadfields, 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 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 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.

Perforated Metals:
Northern Canada Supply Co.
Hendrick Mfg. Co.
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.
Mussens, Limited
Northern Canada Supply Co.
Smart-Turner Machine Co.
R. 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.
M. Beatty & Sons
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:
Mussens, Limited

Rope—Manilla and Jute:
Jones & Glassco
Northern Canada Supply Co.
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.
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.
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.
M. Beatty & Sons
R. T. Gilman & Co.

Silice:

Conlagas 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.
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.
Canadian Ingersoll-Rand Co., Ltd.
Mussens, Limited

Steel Drums:

Smart-Turner Machine Co.

Steel—Tool:

Canadian Fairbanks-Morse Co., Ltd.
H. A. Drury Co., Ltd.
N. S. Steel & Coal Co.
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.
Mussens, Limited
R. T. Gilman & Co.
The Wabi Iron Works

Sulphate of Copper:

The Mond Nickel Co., Ltd.
Conlagas 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

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
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

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 Apparances:

Jones & Glassco

Troughs (Conveyor):

Hendrick Manufacturing Co.

Trucks—Electric:

Canadian Fairbanks-Morse Co., Ltd.

Trucks—Hand:

Canadian Fairbanks-Morse Co., Ltd.

TTrucks:

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.

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

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.
Dominion Wire Rope Co., Ltd.

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.

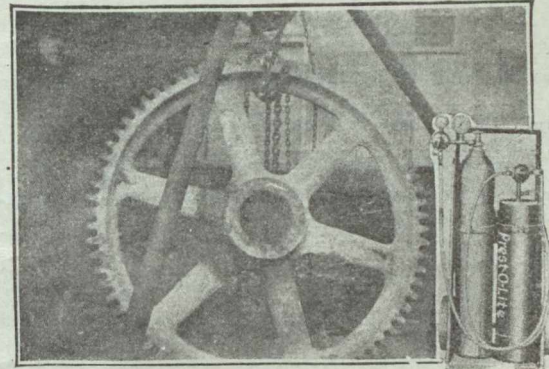
Zinc:

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

Zinc Spelter:

Canada Metal Co., Ltd.
Hoyt Metal Co., Ltd.

Oxy-Acetylene Welding and Cutting



This Expensive Gear Wheel Reclaimed at Trifling Cost.

This gear wheel, in a large plant at St. Catharines, was recently broken. To replace it would have taken much valuable time and represented quite a serious expense.

A local Prest-O-Lite operator was called in and undertook to repair the casting in record time at trifling cost.

The work was done by the job welding department of the International Garage, St. Catharines, Ont., and has given complete satisfaction.

Prest-O-Lite Oxy-Acetylene welding is proving a great economic factor in the Factories, Mills, Railroads, Mines and Machine Shops of Canada.

Prest-O-Lite
PROCESS

employs both gases (acetylene and oxygen) in portable cylinders. Prest-O-Lite Dissolved Acetylene is backed by Prest-O-Lite Service, which insures prompt exchange of full cylinders for empty ones. Provides dry, purified gas, insuring better welds, quicker work and lower operating cost.

Apparatus consists of an equal pressure blow pipe, automatic regulators and gauges, and all necessary equipment. Adaptable for oxy-acetylene cutting by the addition of special cutting blow pipe.

Thorough instructions are furnished free to every user of Prest-O-Lite Dissolved Acetylene. Any average workman who understands metals can learn the welding process quickly and easily.

We will gladly send illustrated literature and interesting data showing actual instances of savings made by others. It may suggest valuable ideas to you. Write for it.

Address Department C -- 108

Prest-O-Lite Company
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Toronto

Plants at:—
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Merritton, Ont. St. Boniface, Man.



World's Largest Makers of Dissolved Acetylene

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Canada Foundries & Forgings, Ltd.	3-35	Hull Iron & Steel Foundries, Ltd.	1	Quebec Graphite Co.	
Canada Wire & Cable Co.	8	Hore, Reginald E.	11	Quebec, Province of	
Canadian Rock Drill Co.		Hoyt Metal Co.		R	
Canadian Steel Foundries, Ltd.		I		Ridout & Maybee	12
Canada Carbide Company	40	Imperial Bank of Canada		Rogers John C.	11
Canada Metal Co.	9	International Business Machines		Rogers, Geo. R.	11
Canadian Brakeshoe Co	7	International High Speed Steel Co.	13	Reddaway, F. & Co.	
Canadian Sirocco Co.		International Nickel Co. of Canada, Limited	5	S	
Capper Pass & Son, Ltd.	10	International Nickel Company	36-37	Shayne & Jaffe Co., Ltd.	
Consolidated Mining & Smelting Co.	39	Inglis, J. & Co.	39	Smart-Turner Machine Co.	7
Coniagas Reduction Co.	7	J		Smith & Travers Company	10
Constant, C. L. & Co.	7	Johnston, Matthey & Co.	10	Standard Underground Cable Co. of Canada, Ltd.	
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Dewar Mfg. Co.	38	Lindsey, G. C. S.	11	Swedish Steel (Bolinder's)	
Department of Mines, Canada		Longyear, E. J. Company		T	
Diamond Drill Carbon Co.	48	Lymans, Ltd.		Toronto Iron Works	
Diamond Drill Contracting Co.	12	M		Tyrrell, J. B.	11
Dominion Coal Co., Ltd.	38	N		U	
Dominion Wire Rope Co., Ltd.		O		University of Toronto	35
Dorr Co.	11	P		W	
Dresser, Jno. A.	11	Q		Wabi Iron Works	8
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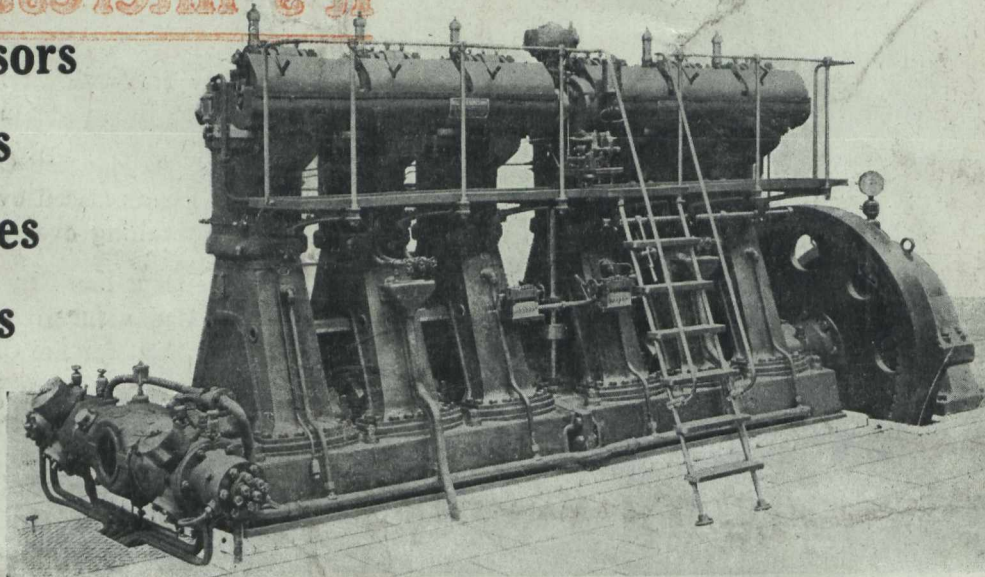
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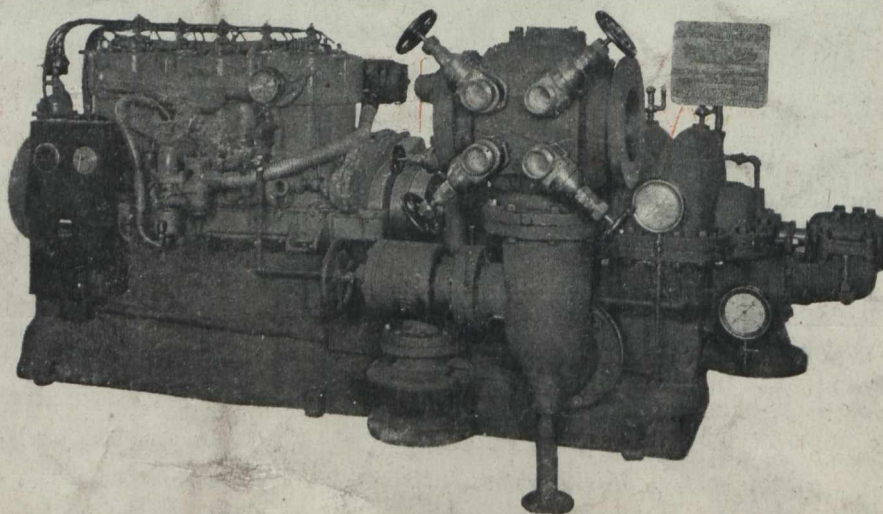
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