

# CANADIAN MINING JOURNAL

Vol. XLI.

Gardenvale, P. Q., June 4, 1920

No. 22

Form No. 303-EM-7-19



CONCRETE FOR PERMANENCE

CANADA CEMENT COMPANY LIMITED

Montreal, Nov 10th, 1919. 191

To The Hull Iron & Steel Foundries Ltd.  
Hull, Que.

**NOTICE**

Send Invoice in Duplicate, put Order Number on Invoices, give number of plant to which Goods are shipped. Do not supply material without an order from the Purchasing Agent.

Order No 94845 / 10  
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PLEASE FURNISH US WITH THE FOLLOWING MATERIAL:

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26 -	Heavy Grinding Plates for #8 Krupp Ball Mills.	

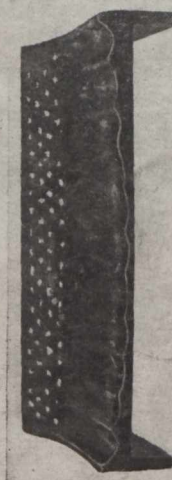
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Dates of Shipment At Once.  
Routing Carter F.O.B. Point Hull.

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*M. R. Hoey*  
Purchasing Agent

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WRITE US FOR INFORMATION

**HULL IRON & STEEL FOUNDRIES, LIMITED**  
HULL, CANADA



# SULLIVAN WATER STOPPERS

Lay the Dust  
Don't wet the Runner



## Sullivan Water Stoppers

can be had for hand or for automatic rotation.

The self-rotator, shown here in a Butte mine, has the new feed-brake. Just "Let her ramble" in any ground. If you hit a fitcher or a "snow-drift," catch her on the brake and save damage.

*Bulletin 670-M*

## Sullivan Machinery Co.

122 So. Michigan Ave.

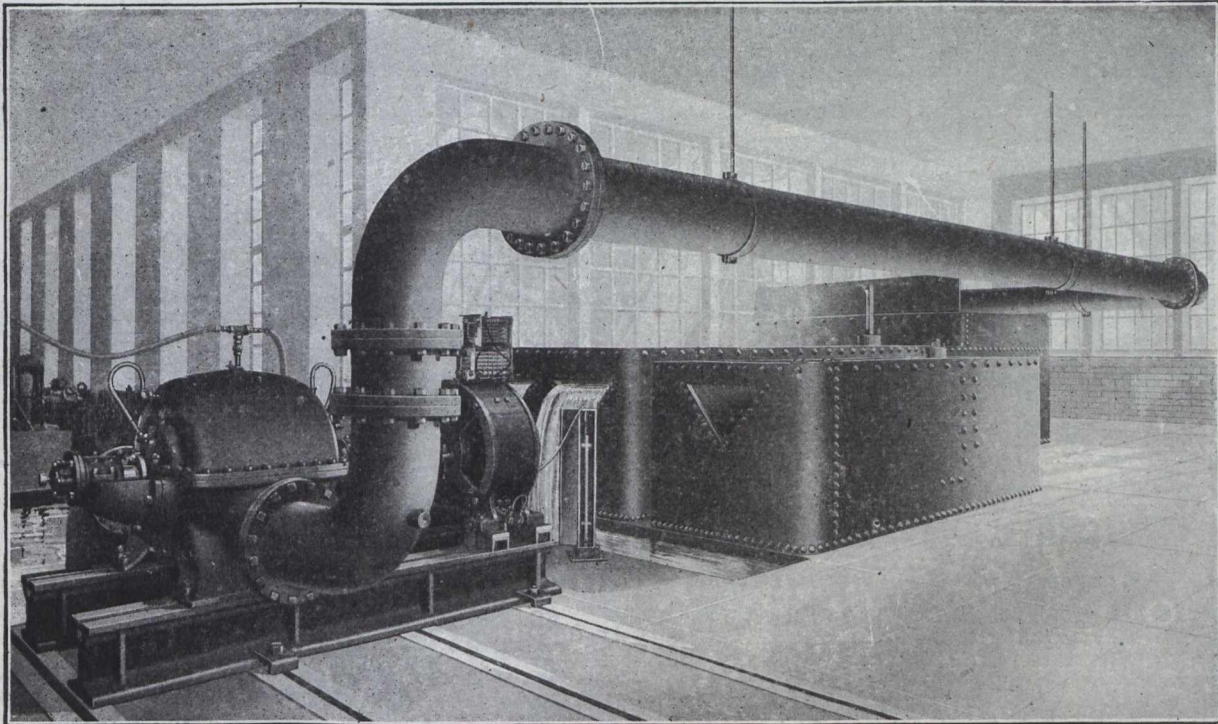
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Showing one of the 4200 gal. per min. Rees RoTURBo Pumps, recently supplied to the Windsor Waterworks, undergoing test on our modern pump testing plant, where all Rees RoTURBo pumps are thoroughly tested before leaving the works

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are used the world over in MINES, Waterworks, Pulp and Paper Mills, Power Stations, Irrigation Works, Salt, Chemical and General Industrial Plants where high efficiency and reliability are demanded.

### REES PUMPS ARE SELF-REGULATING

which means a high and sustained efficiency over a wide range of duties, providing a noticeable saving in power costs and insuring your prime mover against damage by overloading.

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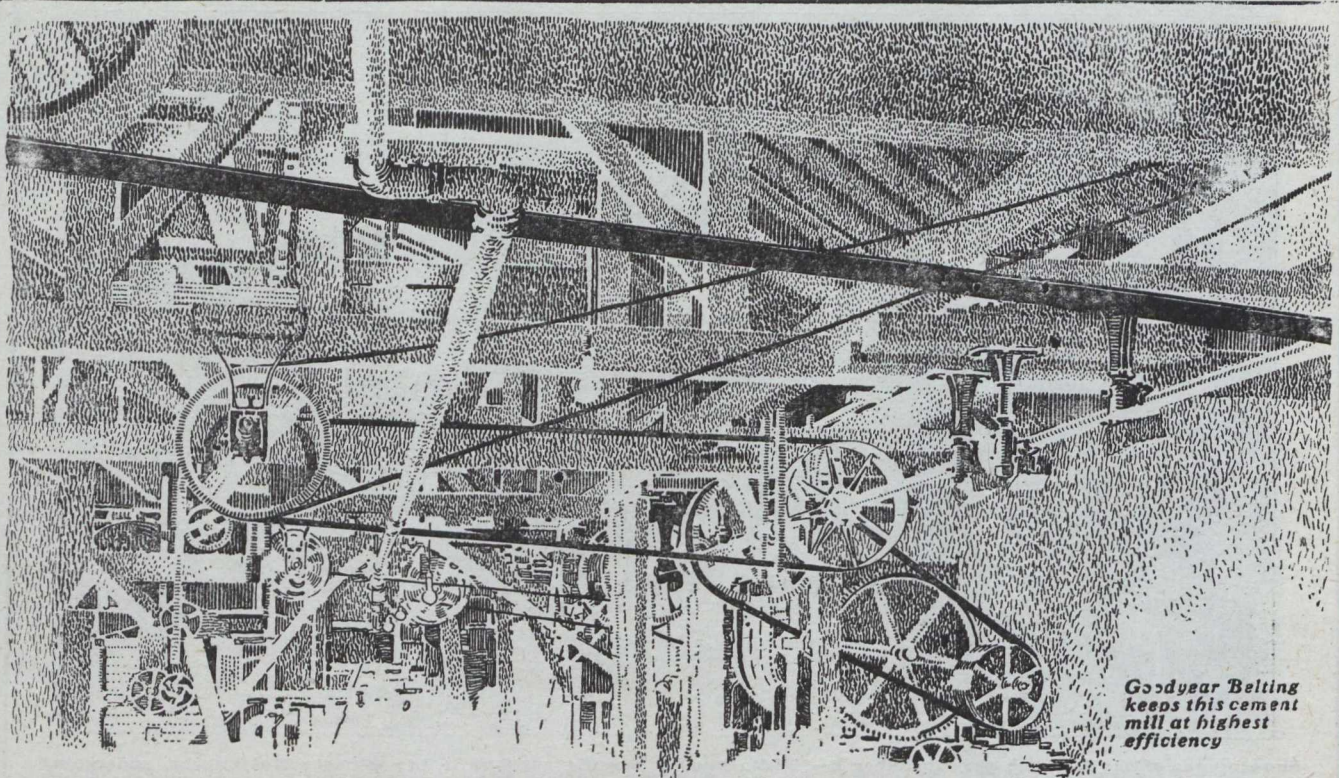
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Goodyear Belting  
keeps this cement  
mill at highest  
efficiency

## Troublesome Small Pulleys

Have you trouble getting belts flexible enough for small pulleys, yet strong enough to last?

Goodyear has produced Extra Power Belting—belting flexible enough that it need not be too tight! Gripping enough to prevent slipping at any speed!

For this is 5-point belting.

1. It is extremely strong, because of specially-designed, properly-woven fabric.
2. Yet it is very flexible, for it

is not stitched, but is welded together with high-grade rubber, forced through and through the fabric and surrounding every thread. It hugs even small pulleys.

3. It has a friction surface which grips, dry or damp, and needs no dressing.
4. It has a seam sealed tight with high quality rubber.
5. The same rubber which gives Goodyear Extra Power its flexibility, prevents ply separation, even when the edge is worn or torn by shifters or accident.

The list of satisfied users of Goodyear Extra Power Belting on small pulleys is very great—too long to print here. But a few are:

Neil Morkin Machinery Co., Edmonton, Alta.  
MacEachern Milling Co., Wetaskiwin, Alta.  
Silver Standard Mining Co., Ltd., New Hazelton, B.C.  
Hollinger Consolidated Gold Mining Co., Timmins, Ont.  
Tilbury Flour Mills, Tilbury, Ont.  
Chisholm Milling Co., Toronto, Ont.  
Essex Canning Co., Essex, Ont.  
Border Cities Tool Co., Windsor, Ont.  
Brechin Roller Flour Mills, Brechin, Ont.  
Nipissing Mining Co., Cobalt, Ont.  
St. George Pulp & Paper Co., St. George, N.B.  
Ungar's Laundry & Dye Works, St. John, N.B.  
Cassong Bros., St. Stephen, N.B.  
Robb Engineering Works, Amherst, N.S.  
Ed. Sinclair Lumber Co., Newcastle, N.S.  
O'Brien, Limited, Nelson.  
Dominion Pulp Co., Chatham.  
Richard's Mfg. Co., Campbellton.

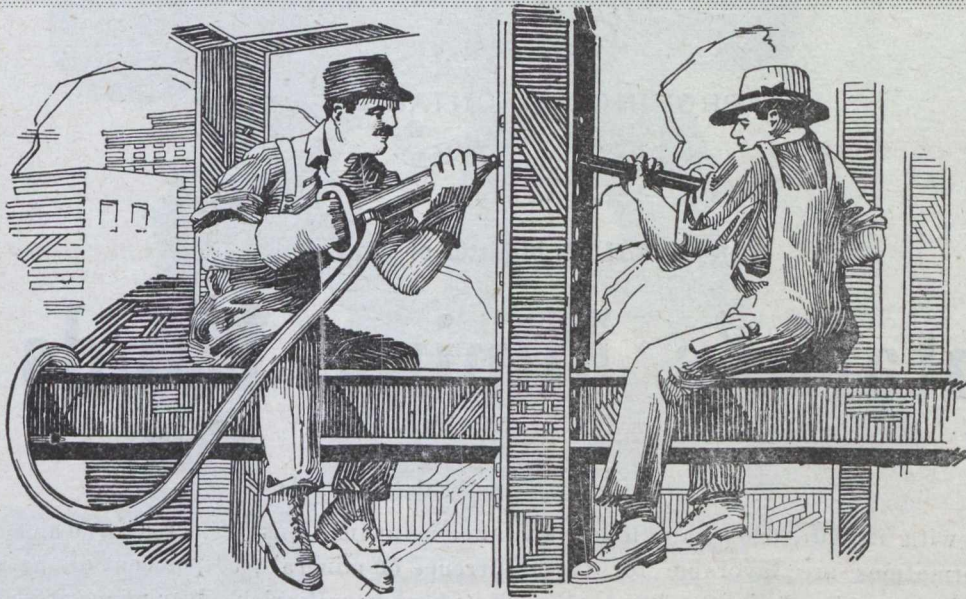
Any one of these firms will be glad to tell you of their experience with Extra Power. Or a Goodyear Belting man will call without obligation to you. Phone, wire, or write the nearest branch.

**The Goodyear Tire & Rubber Co.  
of Canada, Limited**

Branches—Halifax, St. John, Quebec,  
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toon, Calgary, Edmonton, Vancouver.  
Service stocks in smaller cities.

**GOODYEAR**  **YEAR**  
MADE IN CANADA  
**EXTRA POWER BELT**





## The Policy Behind the Goodyear Cord Tire Built This *Better* Hose

**M**ORE motorists would not be riding on Goodyear Tires than on any other brand, if Goodyear scientists had been satisfied with orthodox methods of tire building.

Neither would Goodyear Industrial Hose possess the qualities that enable it to give longer, more satisfactory service, if old-fashioned methods had been followed in its construction.

Modern industry's methods were studied exhaustively to ascertain the conditions industrial hose must meet in use. Then new formulae were created, new and more exacting standards set—resulting in a better hose, capable of standing up under the severest service.

The long service given by Goodyear Air Drill and Goodyear Pneumatic Tool Hose in mines, quarries, shipbuilding yards and structural work—where it is dragged over rocks and steel girders, beaten by ore and building materials—is evidence of the thoroughness of construction of all Goodyear Industrial Hose.

The cover on any air drill or pneumatic tool hose is prominently responsible for the life of the hose. The extra-heavy cover of tough, white rubber on Goodyear Air Drill and Goodyear Pneumatic Tool Hose resists wear and greatly prolongs the life of the hose.

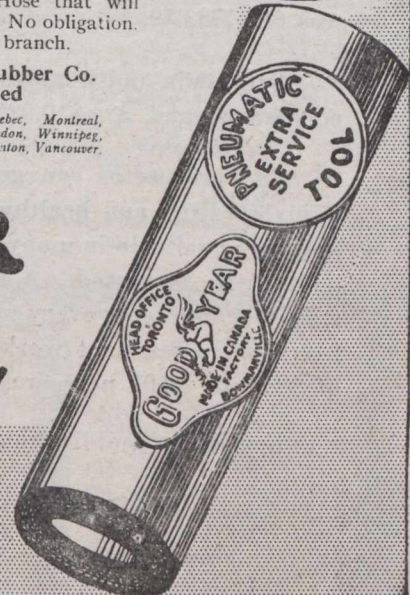
Inside this hard-wearing cover is a special, oil-resisting inner tube, and a fabric of such strength that five-ply is found as satisfactory as six or seven-ply of old-style hose.

Records of Goodyear Air Drill Hose giving from 18 months to 2 years' service are in our files. We have similar records of long, satisfactory service and lessened hose costs, due to the use of Goodyear Industrial Hose in other classes of work.

Let a Goodyear man specify the particular kind of Goodyear Industrial Hose that will lessen hose costs in your plant. No obligation. Phone, wire or write the nearest branch.

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of Canada, Limited**

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**GOOD YEAR**  
MADE IN CANADA  
**INDUSTRIAL HOSE**





PROVINCE OF ONTARIO



BUREAU OF MINES

HON. H. MILLS, Minister of Mines.

# Ontario's Mining Lands

Ontario, with its 407,262 square miles, contains many millions of acres in which the geological formations are favorable for the occurrence of minerals, 70 per cent of the area being underlain by rocks of pre-Cambrian age. The phenomenally rich silver mines of Cobalt occur in these rocks; so also do the far-famed nickel-copper deposits of Sudbury, the gold of Porcupine and Kirkland Lake, and the iron ore of Magpie and Moose Mountain Mines.

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

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

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

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

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

For list of publications, illustrated reports, geological maps and mining laws, apply to

**Thos. W. Gibson,**

Deputy Minister of Mines,

Toronto, Canada





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“C” Class Link-Belt is superior because of its joint construction which insures a long life of efficient service.

Link-Belt buckets are made by experienced molders who specialize on this work. They are remarkably free from blemishes and other casting deficiencies, have clean edges and sharp corners; gates are ground off and they are thoroughly oiled before shipment.

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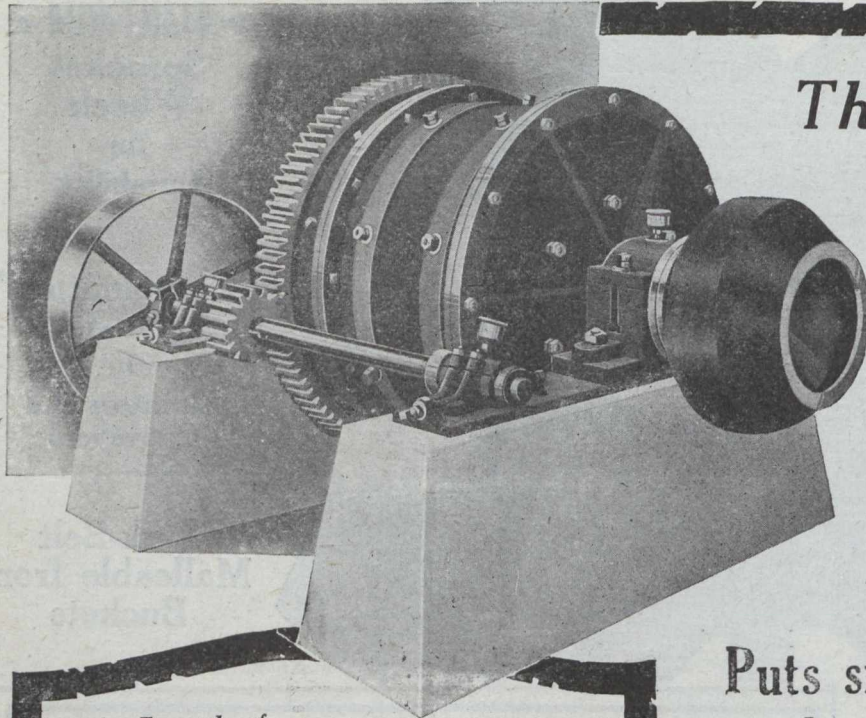
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Place X in Square





The "Baby"

# MARCY BALL MILL



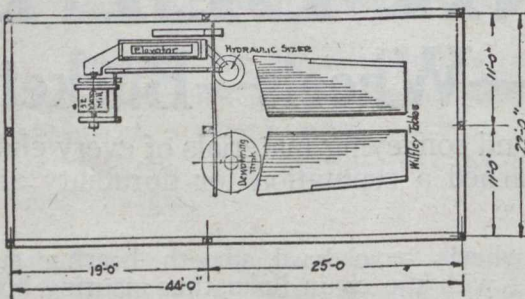
Puts small tonnage plants on a basis approaching large tonnage efficiency

The plant putting through a low tonnage need not be under a great cost handicap compared to the big plant with its capacity in thousands of tons per day.

Not if the small plant has called in the "Baby" Marcy Mill and the "one-easy-step" system. It brings "Big" Marcy efficiency and "one-easy-step" savings to the door of the smallest tonnage plant.

The little No. 32 Marcy Mill is ideal for plants around 10 to 15 tons capacity (it can handle much more); requires 4 H.P.; has all the features of its big brothers Nos. 43, 54, 64½, 75 and 86 Marcy Mills.

An Example of  
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Typical layout for an efficient 10 ton plant

Feed is medium hard quartz crushed to 1½ in., charge of balls 500 lb. (usual charge 800 lb.). Grinds through 8 mesh—1½ tons per hour. Operator says: "We have never had the full charge of balls in the mills as our table capacity will not care for more than 1½ tons per hour. I feel safe in saying that with a full load of balls and the feed 1 inch and smaller the mill will handle fifty tons per twenty-four hours."

Marcy Mill capacities run from 10 to 500 and more tons per day.

Write for Bulletin 42

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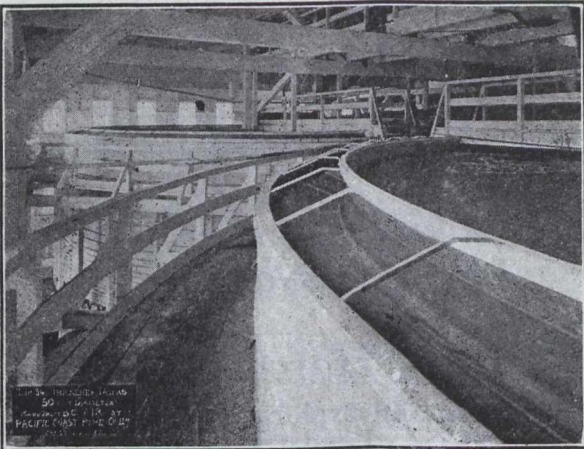
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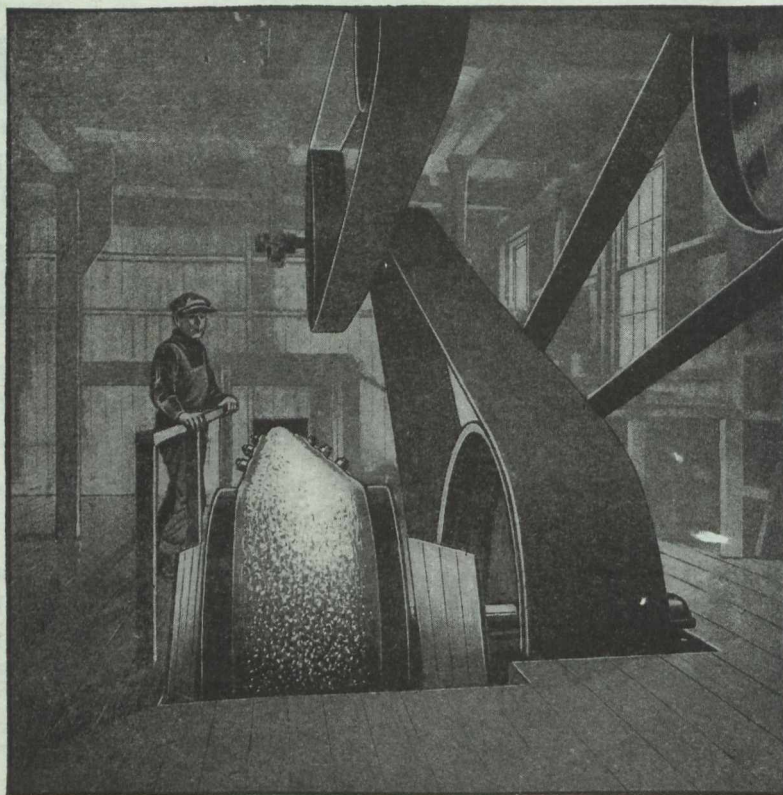
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# Canadian Mining Journal

PUBLISHED WEEKLY.

Devoted to the Science and Practice of Mining, Metallurgy and the Allied Industries; and more particularly to their progress in Canada.

VOL. XLI.

GARDENVALE, P.Q., June 4, 1920

No. 22

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Published every Friday by The Industrial and Educational Publishing Co., Limited, at the Garden City Press, Gardenvale, Que. 'Phone, Ste. Anne de Bellevue, 165.

J. J. Harpell, Managing Director.

A. S. Christie, Eastern Manager,  
Room 205 Drummond Building, Montreal.  
'Phone Uptown 7773.

H. W. Thompson, Western Manager,  
1402 C.P.R. Building, Toronto.  
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,  
528 Winch Building, Vancouver, B.C.  
'Phone Sey. 3920.

Changes in advertisements should be in the Publishers' hands ten days before the date of issue.

F. W. GRAY, M. I. Min. E., Editor,  
Gardenvale, Quebec.

REGINALD E. HORE, Consulting Editor,  
1403 C. P. R. Building, Toronto

The editor cordially invites readers to submit articles of practical interest which, on publication will be paid for.

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# EDITORIAL

## Coal—A First Essential of National Independence

The Report of the United States Committee on Canadian pulpwood embargoes contains the following statement:—

“The testimony also conclusively shows that we must have pulpwood from the Crown Lands and three provinces in the Dominion, otherwise our papermills will be eventually compelled to close down or move into the Dominion of Canada. Canada must have coal, sulphur, kaolin and dyes from the United States, or suffer a similar misfortune.”

The ending of this phrase is ambiguous. Whether it is intended to imply that it would be a misfortune to United States mills to move into Canada, or that it would be a misfortune to Canadians to have to move into the United States we are unable to gather from the wording, but there is no ambiguity about the statement “Canada must have coal, sulphur, kaolin and dyes from the United States.” Nevertheless it is an incorrect statement. Canada does not have to obtain either coal, sulphur, kaolin or dyes from the United States. All, or any of these materials we can supply from our own resources, if we care to.

Ontario can produce the sulphur, Quebec can supply the kaolin, and either Nova Scotia or Alberta can supply the coal and the dyes, if it is considered necessary.

There is one thing, however, that Canada can not do. She cannot maintain her national independence unless she will proceed to make the Dominion self-supporting in coal supply.

We do not make the statement that Canada can obtain coal from her own mines as cheaply as it can be brought from the United States, but we venture to reaffirm the opinion expressed before the Annual Meeting of the Canadian Mining Institute in relation to our coal supply, namely, that “Canada cannot be run as a successful economic whole if we ignore the obligations of nationality and insist on buying goods in the cheapest market merely because they are cheap. That way lies loss of independence and national disintegration.”

These definite opinions are admittedly dogmatic. The circumstances do not, in our opinion, admit of any modification, if it is admitted that the possession of a sufficient supply of bituminous coal is a necessity of national independence and defence. On this point the

rulings of the Supreme Council are specific. Pick out any part of Europe affected by the war where coal occurs, and there the fighting will be found to have been most prolonged and bitter. Select any territory regarding which the framers of the Peace Treaty found greatest difficulty in satisfying the disputants, and usually it will be found to be a coal district. The places that are recorded with greatest pride on the war banners of the Canadian Expeditionary Force might also be a record of the coal-mine villages of France and Belgium. There is no activity of peace or war in our modern life that is not based on some phase of the utilization of bituminous coal.

If therefore, Canada, through lack of taking thought, or following a policy of ease, continues to allow her own coal deposits to remain undeveloped, and voluntarily places our country in a position of economic dependence for the essential and indispensable raw material of our times, there is no escape from the conclusion that little by little Canada will become economically subservient to the United States. We express no opinion on the desirability of such an evolution. That is politics, and not the business of a technical journal, but it cannot be otherwise than proper to point out how inevitable are the consequences of continued lack of national interest in Canada's coal supply.

In the Canadian Mining Institute “Bulletin” during May 1917, the Editor contributed the following opinions, which are quoted as reflecting to some extent the more pleasant spirit of those crucial days; as a reminder that the foregoing opinions are not expressed with any desire to be captious or lacking in appreciation of the comradeship that has existed between this country and its neighbor; and also as bearing on the national importance of coal.

“The Allied Nations are grateful to the United States first, because the adherence of this great Republic is an open vindication of the righteousness of the common cause, and secondly, because the United States is an Ally possessing unlimited potentialities.”

“The idealistic and spiritual strength of her people, her great wealth, her large population and military possibilities, are gratefully acknowledged and duly weighed, but what is the greatest asset of the United States as the Ally of the free nation of Europe?



"Is it not undoubtedly that the United States possesses within its borders the largest, most accessible, and the most valuable bituminous coal deposits in the world? That is the basic fact underlying all the wealth and industrial activity of the United States."

"The part that the United States will play in the war will be measured and limited by the production of bituminous coal."

So also will Canada's progress towards a place of honor in the councils of the Empire and among the sovereign nations of the World be measured and limited by her production of bituminous coal.

#### INVESTIGATION OF INTERNATIONAL NICKEL COMPANY'S OPERATIONS.

A Toronto newspaper, commenting on Premier Drury's promise to investigate the questions affecting provincial taxation of the profits of the International Nickel Company, writes editorially:—

"Perhaps Mr. Curry will not succeed in having his view adopted that all the International Nickel Company's lands should be confiscated if it is shown that nickel reached Germany during the war with the Company's knowledge."

So far as the operations of the International Nickel Company are concerned, these were investigated by a Royal Commission that had an unassailable personnel, and were reported upon in one of the completest and most satisfying documents ever issued by the authority of a legislature. In this Report no less than twenty-three pages are devoted to consideration of the taxation of mines and the mining industry as practised in all parts of the British Empire and in the other countries of the world, and as bearing upon the question of taxation of the nickel industry in Ontario. Whatever form the promised investigation may now take, it may be stated that the basic and pertinent facts are all to be found in the Report of the Royal Ontario Nickel Commission of 1917.

As to the implications that nickel reached Germany during the war with the knowledge of the International Nickel Company, this is as unworthy as, in the best-informed circles, it will be considered unfounded. Probably the problem that gave most worry, not only to the International Nickel Company, but to the British Government and the State Department of the United States, was to prevent nickel finding its way to Germany. Up to April 1917 the United States was a declared neutral, but there was a very large portion of the population in the United States that during the interval between the Summer of 1914 and the declaration of war upon Germany — a space of thirty-two months — was whole-heartedly in favor of Germany's cause. The cordial reception given by the people of

Newport to the "Deutschland" is an instance of the forces that had to be overcome by those who desired to keep munitions of war from reaching Germany, nor was there anything illegal in supplying such munitions to a German vessel. If, in spite of all precautions, Canadian nickel reached Germany during the war, the persons who managed the International Nickel Company were not in a worse or more blameable position than the secret service men of the Allies who labored night and day to close the door to Germany.

If the Government of Ontario contemplates wading through the portfolios of Dr. Albert, the memoirs of Count Bernstoff, the "ditty-box" of Capt. von Papen, and tracing the spoor of German intrigue through the mucky labyrinth of the period immediately preceding and following August 1914, the imposing bulk of the 1917 Report will have to be far exceeded. It is a long trail, very sinuous, and will be found to lead nowhere.

#### SIR AUCKLAND GEDDES ON OIL PROPAGANDA.

Sir Auckland Geddes shows wisdom and courage in giving an unqualified denial to the statements which have recently been given prominence in both British and United States' newspapers that the British Government, in conjunction with the Dominion Governments, is seeking and deliberately planning a world monopoly of oil.

We have previously expressed the opinion that the sedulous dissemination of false statements of this kind is the work of the propagandists of rival oil interests, and Sir Auckland Geddes' categorical statement corroborates that opinion. In the time of her gravest national emergency, when oil and coal supplies were a matter of life or death for the Empire and its soldiers, British interests controlled, according to our Ambassador's statement, but five percent of the world output. At the same time, he reminded his United States' hearers, "you have 82 percent of the present world supply of oil under your control."

In the paper prepared by C. K. Leith of the United States Geological Survey to show his country's relative economic world position with regard to mineral supplies, petroleum is listed along with copper as one of the two minerals "of which the exportable surplus dominates the world situation". This statement, from such a source, should be authoritative.

Sir Auckland Geddes' characterization of oil wells in the British Isles as "a geological curiosity, not a commercial proposition" may not please some people, but it correctly describes the oil occurrences in the British Isles to date.

English newspapers are much to blame. The cables that are sent to Canada and to the United States purporting to come from well-informed British sources are all too often wrong in fact and foolishly provoc-



ative in purpose. When the proposals for the British Empire Steel Corporation were first given publicity in London, the titbit of the journalist who cabled the news was that English experts had examined the Sydney Steel Works, and had decided they were fit only for the scrap pile. Here was an instance of important news of very general interest turned into provocative nonsense. The instance is typical of many. We cannot conceive, for example, that Sir E. Mackay made the statements attributed to him by a London "Sunday World" cable claiming control of the world's oil resources by British interests in words that no patriotic citizen of the United States could fail to take umbrage at.

Those who send news cables from Great Britain to Canadian newspapers should remember the many bonds of mutual interests that tie this self-governing Dominion to our friends in the United States. Canada's whole-hearted adherence to every British ideal, and her ability, while strictly guarding her national status, to live and work amicably with her great neighbor, need no demonstration after the years 1914 to 1920. We need no spur, or preachment, from jejune imitators in Great Britain of Wm. R. Hearst, nor do we desire that the business game which our citizens and their compeers in the United States have played with energy, yet in all friendship, for a century of peace, across an unguarded frontier that has not its like in history, shall be embittered and endangered by the paid propagandists of selfish interests.

The world is not at peace. In many respects the chances of a world catastrophe are greater today than they were before Germany attacked the pillars of civilization in 1914. From motives of simple self-protection against the forces that threaten to dissolve society, the United States and Britain should hold together. Our Ambassador's categorical exposure of the lies that are being disseminated by the press of the British Isles and the United States is a wise and necessary step, and one that in Canada will be properly appreciated.

"Meantime a new field of perhaps promise looms on the slopes of James Bay, where Professor Williams of the Dominion Geological Survey has been making an examination. His Report, stripped of its "geological ornamentation," is practically to the effect "that there is plenty of evidence of seepage, and the future may yet find much of commercial value."

So states a well-known Toronto newspaper. The term "geological ornamentation" is ill-chosen. Dr. Williams' condensed report on the James Bay region was, as a matter of fact, rather remarkable for its clearness and avoidance of unnecessary use of geological terms. (See page 82, issue 30th, Jan. 1920.)

### THE LATE G. G. S. LINDSEY.

The "Journal" desires to voice a general feeling of regret among the mining profession of Canada at the loss by death at a comparatively early age of Mr. G. G. S. Lindsey. Mr. Lindsey was an illuminating example of the distinctive advantage of combining legal ability and a practical acquaintance with mining. During his term as President of the Canadian Mining Institute, Mr. Lindsey was very largely responsible for the affiliation of the Mining Society of Nova Scotia which followed his visit, accompanied by a most representative delegation of members of the Institute, to Sydney, Nova Scotia, in the Spring of 1914. This was a courtesy not forgotten by the members of the Institute in Nova Scotia, where Mr. Lindsey, by his alert and engaging personality, left a pleasant and enduring memory.

By Mr. Lindsey's death, the mining profession in Canada, and in particular the Canadian Mining Institute, loses a member whose lifework has added distinction to its annals, and permanence to its foundations. Mr. Lindsey's attendance at the March meeting of the Institute in Toronto was doubtless made at the expense of much physical effort, but it was an instance of his devotion to the affairs of the Institute, as is only too plainly evidenced by his death at this time.

### GOOD PROGRESS BEING MADE AT FLIN FLON

Mr. Jack Hammell has returned to Toronto after spending some time at The Pas and Flin Flon making preparations for the development of the great sulphide orebody at Flin Flon Lake. Acting for the men who have taken option on the property, Mr. Hammell has assembled at the mine the necessary machinery and supplies for the work to be done this summer. The plant at the Mandy mine and that at Beaver Lake have been purchased and taken to the Flin Flon mine. The dismantling was successfully accomplished before the winter roads broke up. Owing to the difficulty of moving machinery and supplies in this district during the summer months, an effort was made to fully utilize the winter roads while they lasted. This meant haste, but Mr. Hammell believes that the engineers who take charge of the development work will find the necessary materials on the job.

It is planned to sink two shafts. The Mandy plant will be used for one and the Beaver Lake plant for the other. The contractors have an excellent reputation as shaft sinkers and it may be expected that no time will be lost in opening up the orebody. It is understood that work at one shaft will proceed to depth without interruption, while at the other lateral work will be started at several levels as soon as the necessary depths are reached. It is said that about \$85,000 has already been spent in making preparations for the work. Col. W. B. Thompson and associates, of New York, and the Mining Corporation of Canada, of Toronto are said to be the holders of the option.



# The High Grade Silver Ores of the Stewart District, British Columbia

By VICTOR DOLMAGE.

The rich silver deposits of the Stewart District, British Columbia, are now engaging more attention than any other silver deposits in the world. The camp is still in its infancy, no development work having reached a depth greater than 250 feet, and, as in the case of all high grade deposits, the operators and investors are facing the vital problem of whether the orebodies are of the secondarily surface enriched type, and consequently of relatively shallow depth, or whether they are high grade primary ore-shoots with good chances of persistence to relatively great depths.

At the Western Annual Meeting of the Canadian Mining Institute held in Vancouver in November, 1919, Mr. E. E. Campbell<sup>1</sup> read a paper on the mineral deposits of this district in which he stated somewhat arbitrarily, that the high grade orebodies were "rich surface ores," which I take to mean ores enriched by downward moving surface waters and commonly referred to as secondary ores. Although he spent considerable time in pointing out the great importance of the discovery of this class of ore in the northern districts of the Province, he entirely neglected to give any evidence that would prove that these ores have a secondary origin. He mentioned the fact that the deposits carried minerals of "unquestionable secondary origin" but failed to give any examples of this small uncertain and rapidly dwindling class of minerals. He named the following as the minerals occurring in the rich orebodies; pyrite, native silver, argentite, rubysilver, sphalerite, galena, and chalcopyrite, but we fail to find in this list any of the "unquestionably secondary" class, rather they are conspicuously absent. Ruby silver is the only one of those mentioned which approaches this class, and of it W. H. Emmons<sup>2</sup> goes only so far as to say that it is *nearly* always secondary. The other minerals of this list undoubtedly occur as primary minerals.

In the discussion which followed the reading of this paper, the present writer took exception to the arbitrary manner in which this vital problem had been handled, and pointed out the lack of any evidence to prove the statements made. A few months later, when a splendid collection of ore from this locality was submitted to me at the British Columbia Branch of the Canadian Geological Survey for examination, I naturally took advantage of the opportunity of searching for evidence having a bearing on this point, and made a careful microscopic study of the ore, the results of which follow.

The specimens were collected and brought in by Mr. Charles Bunting, one of the original locators of the rich deposits of this district, and the author of the first authentic history of the Salmon River Camp.

Three classes of ore were represented in this collection, namely: (1) stephanite-native silver ore, which is the richest silver ore of the district, carrying as high as 3,000 oz. of silver to the ton; (2) a type which is known in the district as "Black sulphide ore," which carries from 500 to 1,000 oz. to the ton, and (3) lower grade silicious ore.

The *Stephanite ore*, though exceedingly rich, is not abundantly distributed, but confined to a few small veins less than a foot in width. In appearance it is quite spectacular, consisting of masses of stephanite and tetrahedrite cut by a close net-work of native silver veinlets and sprinkled through with a few small grains of pyrite. Gangue minerals are absent excepting for small inconspicuous grains of milky quartz. Plate 1, 2, 3 and 4 illustrate this class of ore.

The microscope revealed the following minerals and structures in them which indicate that they were deposited in the order named:—

1. Pyrite
2. Quartz
3. Zinblende
4. Tetrahedrite
5. Chalcopyrite
6. Galena
7. Argentite
8. Stephanite?
9. Polybasite?
10. Native silver
11. Native gold.

The Pyrite occurs as sparsely scattered grains ranging in size from a few millimeters to a centimetre, which are invariably rounded, embayed and veined by replacements of quartz, zinblende, chalcopyrite, tetrahedrite, galena, native silver and gold. One of these pyrite grains is shown in Plate 5.

Zinblende, though abundant in the black sulphide ore is comparatively rare in the ore of this class, and only visible under the microscope. It is sprinkled through with minute grains of chalcopyrite and is replaced by tetrahedrite and stephanite.

Tetrahedrite is an abundant mineral in this ore, as is shown by Plate 1. It is replaced by stephanite and native silver.

Stephanite is the predominating mineral in this ore and constitutes at least 50 per cent of the total volume of the specimens examined. It replaces the pyrite zinblende and tetrahedrite, and is itself replaced by native silver.

Polybasite is a rare mineral in these deposits and is found closely associated with stephanite and native silver.

Native silver is abundantly present in this ore, occurring as small blebs in the pyrite grains as shown in Plate 5, and as veins in the stephanite and tetrahedrite, as shown in Plates 1, 2, 3, and 4. These veinlets in some places have sharply defined contacts such as those in Plates 2, and 3, and in other places they gradually merge into rich disseminations, such as is shown in Plate 4.

Though assays show that this ore carries considerable gold, very little could be detected, even under

<sup>1</sup> E. E. Campbell, Mineral Occurrences in the Stewart District, Monthly Bulletin of The Canadian Mining Institute, March 1920.

<sup>2</sup> W. H. Emmons, The Enrichment of Ore Deposits, Publications of the United States Geological Survey, Bulletin 625, page 261.



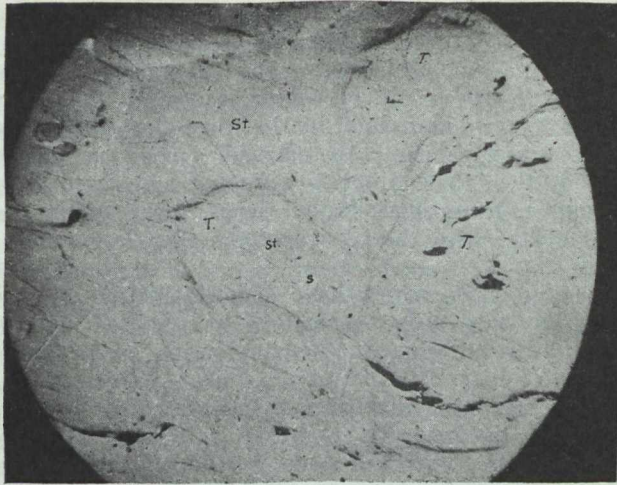


PLATE I  
Stephanite (St.) and tetrahedrite (T) replaced by veinlets of native silver (S) from Stephanite-Native silver ore. Mag. 300 diameters.

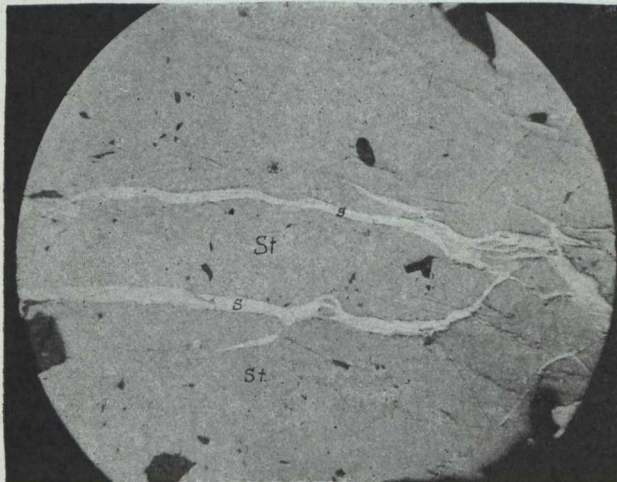


PLATE II  
Stephanite (St) replaced by native silver (S). Mag. 300 diameters.

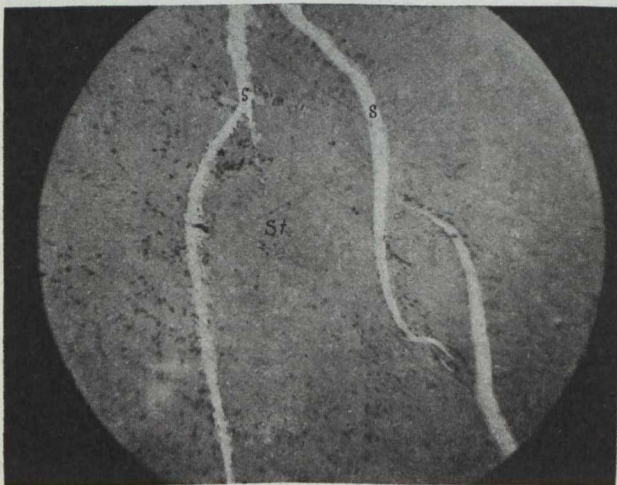


PLATE III  
Stephanite (St.) cut by silver veinlet (S) and etched by the action of light. Mag. 300 diameters.

the highest magnification. It was, however, observed as minute particles, both in the pyrite grains and in the gangue minerals free from other metallic minerals. Plate 6 shows a grain of pyrite including a small bleb of gold.

The second class of ore, known in the district as black sulphide ore, is the usual type of ore encountered in the workings. In hand specimens it is seen to consist of a dark-gray fine-grained mixture of gangue minerals, zincblende, galena tetrahedrite, and pyrite. It is slightly porous, and the vugs are usually found to be lined with crystals of galena and drusy quartz.

Under the microscope it was seen to contain the following minerals which were deposited roughly in the order in which they are named:

1. Gangue (chiefly quartz)
2. Pyrite
3. Quartz
4. Zincblende
5. Chalcopyrite
6. Tetrahedrite
7. Galena
8. Argentite
9. Native silver
10. Gold.



PLATE IV  
Stephanite (St.) replaced by veinlets and desiminations of silver (S). Mag. 300 diameters.

The similarity of this list to that of the stephanite ore is striking, the only difference being in the absence of polybasite and stephanite. The great difference in appearance is due to the much larger proportion of zincblende, galena, pyrite and gangue and a smaller proportion of native silver. Plate 7 illustrates this class of ore.

The pyrite of this ore is precisely the same as the pyrite of the stephanite ore, being replaced in a similar manner by the same minerals, as is shown by Plate 8.

The zincblende is the most abundant mineral of the sulphide ore and, as usual, is impregnated with minute specks of chalcopyrite. It is also replaced by tetrahedrite, galena and native silver.

The chalcopyrite, which was confined to the zincblende in the stephanite ore, is in this ore freely distributed through the gangue and other minerals, but only as very small particles.

Tetrahedrite and galena are both abundant in this ore, and though no silver minerals could be detected in them other than an occasional grain of silver, there can be little doubt that they are both argentiferous.

The native silver of this ore, though not as abundant as that in the stephanite ore, is nevertheless quite



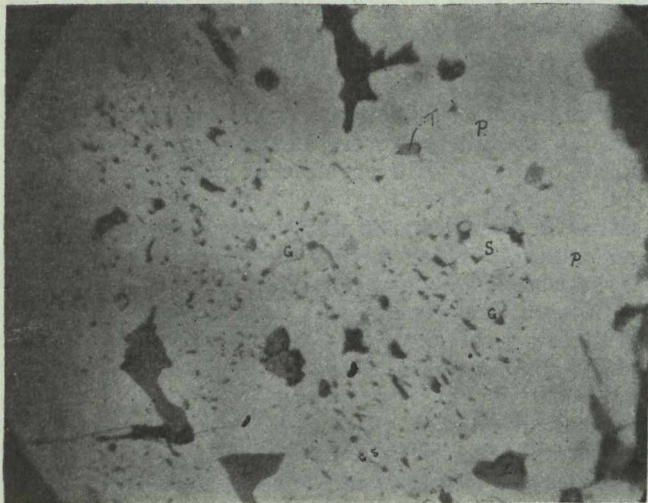


PLATE V

Pyrite (P) grain replaced by silver (S) galena (G) zincblende (Z) and quartz (Q). Mag. 330 diameters.

plentiful. In this ore it never occurs in veinlets, such as those of the stephanite ore, but is always found in the form of small rounded grains in the galena, zincblende, tetrahedrite and pyrite, usually showing a preference for pyrite and tetrahedrite. This mode of occurrence is well shown in Plate 9 and seems to strongly indicate that it was deposited in the same general period as the other sulphides and is therefore a primary mineral in this ore.

Argentite is a rare mineral in this ore and is associated with the other sulphides in a manner indicating that it also is a primary constituent.



PLATE VI

Pyrite (P) replaced by gold. Mag. 500 diameters.

The third class of ore is a strongly silicious type, consisting of white granular quartz with small scattered particles of pyrite, tetrahedrite, polybasite, stephanite(?), galena, argentite, ruby silver and native silver. It is low grade in comparison with the other ores, but is very abundant in the district. All of the minerals are replaced to a marked degree by native silver; but the other minerals were not associated with one another, being distributed through the quartz as isolated grains, and their paragenesis therefore not indicated.

Of the minerals which have been identified in this deposit, the only ones that might be used as criteria for secondary enrichment are stephanite, pyrargyrite, and native silver. Stephanite has been proven to occur as a secondary mineral in a great many enriched deposits, and is generally regarded as a mineral characteristic of the enriched zone, but a possibly primary origin is admitted by many of the closest students of this subject. Its presence therefore may be regarded as a strong indication of secondary action, but not

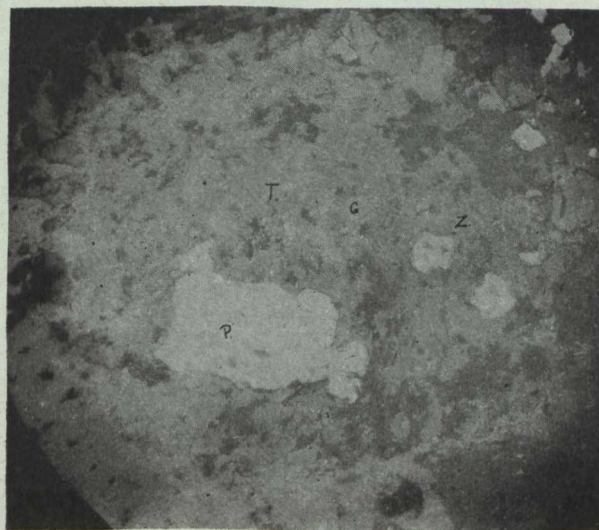


PLATE VII

Black Sulphide ore. P = pyrite, T = tetrahedrite, G = galena. Mag. 75 diameters.

as conclusive proof. Pyrargyrite is a much more common constituent of secondarily enriched ores than stephanite, but it, too, according to Emmons<sup>3</sup>, has been found in mines at depths greater than those reached by surface solutions.

Native silver was at one time thought to be invariably of secondary origin in sulphide ores, but it is not now regarded as such. In a recent paper on the "Veins of Cobalt, Ontario," W. L. Whitehead<sup>4</sup> has given excellent proof of the primary nature of the native silver of these deposits. In the ore under discussion the native silver occupying rounded pockets in the pyrite, tetrahedrite, and galena (such as is shown in Plates 5, 8, and 9) is almost certainly of primary origin, while that forming veinlets in the stephanite as shown in Plates 1, 2, 3, and 4 may be of secondary origin.

The impossibility of definitely determining the origin of this ore without an examination of the conditions obtaining in the field and without a study of the

<sup>3</sup> W. H. Emmons, Principles of Economic Geology, page 445.

<sup>4</sup> W. L. Whitehead, The Veins of Cobalt, Ontario, Economic Geology, March 1920.



enclosing rocks and gangue is evident. Nevertheless, the above observations furnish evidence capable of supporting the following conclusions.

(1) The black sulphide ore is at the same time a very plentiful ore of the district, one of the highest grade ores of the district, and one composed of essentially primary minerals. This establishes the important and interesting fact that much of the high grade ore of the Stewart District is of primary origin, and has therefore a much better chance of persisting to relatively great depths than if it were of secondary origin, a fact of considerable significance in a camp so highly promising on the surface and as yet so slightly developed.

(2) The stephanite-native-silver ore may have been enriched by the replacement of primary minerals by stephanite and native silver, and the silicious ore by the addition of ruby silver, stephanite and native silver, but in neither case is it definitely proven.

(3) The small amount of stephanite ore to be found in the district, the comparative low grade character of the silicious ore, and the great preponderance of primary minerals over secondary minerals in all the ore excepting the stephanite ore, indicate that the processes of secondary enrich-



PLATE VIII

Pyrite grain (P) from black sulphide ore replaced by silver (S) tetrahedrite (T) and galena (G). Mag. 250 diameters

ment may have played only a very subordinate role, if any, in the formation of these rich silver deposits.

**Silver Minerals Etched by Light.**

An interesting phenomenon observed in connection with the microscopic examination of these specimens, and one which served as an aid in determining the minerals, is the etching of the stephanite and native silver by the action of light. This peculiar property of silver minerals was first described by W. L. Whitehead<sup>5</sup>, who made observations on all the common silver minerals and recorded his results in tabular form, so that they could be used for purposes of identification. The Stephanite of the Stewart District was found to be very susceptible to light, and on an ex-

<sup>5</sup> W. L. Whitehead, Notes on the Technique of Mineralogy, Economic Geology, xii, 1917, page 707.



PLATE IX

Primary minerals of black sulphide ore. S=silver G=galena T= tetrahedrite P=pyrite, G=quartz. Mag. 200, diameters.

posure of from 10 to 30 seconds it would become covered with minute specks similar to those shown in Plate 3. Areas in the vicinity of silver veinlets and along scratches were found to be the most sensitive. Plate 10 shows some of these spots of unusually large size developed in two sets of parallel rows intersecting one another at a small angle, which are thought to be related to scratches produced during the process of polishing.

It is a well known fact in polishing that when a scratch is made on the surface of any material there

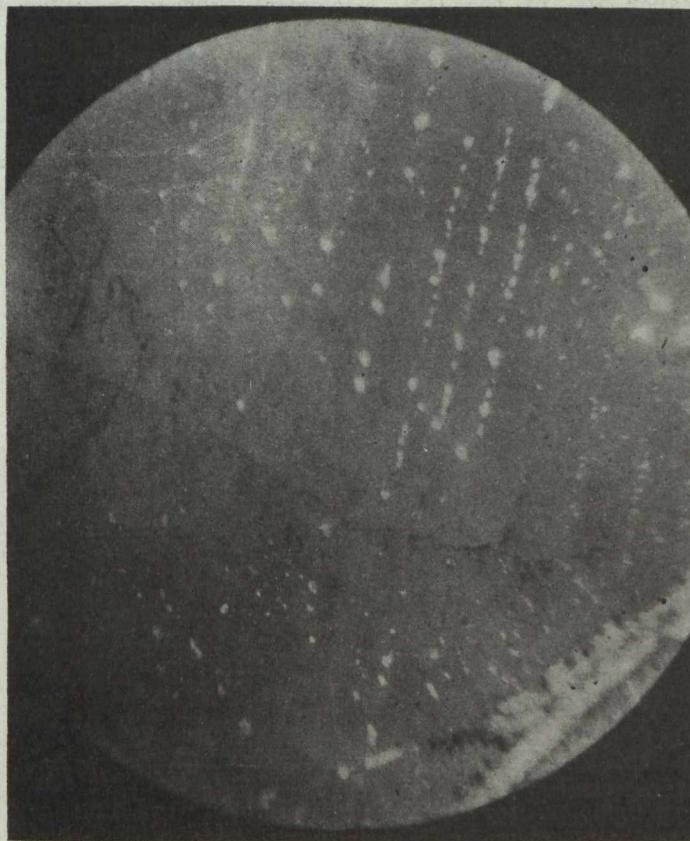


PLATE X

Stephanite etched along polishing scratches. Mag. 600 diameters.



is developed in the material below the visible scratch a zone which though not apparently affected, is nevertheless considerably modified so that it behaves differently under etching reagents. These modified zones vary in size and degree of modification with the size of the scratch which has produced them, and it is for this reason that the spots etched on the surface of a polished mineral are sometimes found to be arranged in lines such as those shown in plate 11.

These spots were of such a large size that an attempt was made to determine their character by the usual methods employed in mineralography. They were found to react with nitric acid and *aqua regia* in a manner similar to that of native silver, and their color also resembled native silver. It is therefore probable that they are to some extent at least composed of this metal and that the effect of the light on the mineral is to dissociate it into its elements. This is, however, only a suggestion and far from being proven.

The silver occupying the veinlets in stephanite was also in many instances found to be altered to a brownish red color by the action of light, a peculiar feature I think not previously mentioned in the literature. The coloration was found to be confined to the smaller veinlets, to the margins of the larger veinlets and was most strongly marked in the fine disseminations of silver in the stephanite, such as are shown in Plate 4. The phenomenon is thought to be the result of impurities in the silver, though this appears to be homogeneous under the highest powers of magnification.

These facts show that the minerals stephanite and polybasite are very unstable, and it is therefore not surprising to find them so extensively replaced by native silver.

*Note.*—Since the above article was written, the attention of the author has been drawn to Professional Paper 104 of the U.S. Geological Survey on "The Genesis of The Ores of Tonopah, Nevada," by Edson S. Bastin and Francis B. Laney, in which these authors find the minerals stephanite, polybasite, pyrrhotite, argentite, electrum, etc., occurring as primary minerals as well as secondary minerals in the ores of that camp.

### THIRD ANNUAL MEETING OF THE CANADIAN INSTITUTE OF CHEMISTRY, TORONTO, MAY 27th and 28th, 1920.

The third Annual Meeting of Canadian chemists was held in Toronto on May 27th and 28th, and was well attended by members from all parts of Canada, and by visitors from the United States.

Among the papers read was one by Messrs. Roast and Pascoe, given before the Montreal Branch of the Society of Chemical Industry in February last, on the "Inner Life and Habits of Metals." This paper was fully illustrated by a series of microphotographic slides, prepared by the authors. Mr. Roast is the Secretary-Treasurer of the Canadian Institute of Chemistry, and an ardent worker in the interests of the profession.

A much appreciated feature of the meeting, which was held in Chemistry and Mining Building of the University of Toronto, was the public display of chemical apparatus and instruments.

Dr. Charles H. Herty, Editor of the "Journal of Industrial and Engineering Chemistry," and a past-president of the American Chemical Society, addressed the meeting on "Chemistry under a Constitutional Government," and pointed out convincingly how great

a part the chemist played in the industrial life and in the military defence of a democratic state.

Prof. Matthew A. Parker, of the University of Manitoba, was appointed a delegate to the inter-Allied Chemical Congress in Rome during July. This is the second meeting of the Congress, which was organized last year in Brussels to pool chemical progress and research in the interest of the countries that were allies during the war.

The Toronto Meeting was the first annual meeting of the newly formed Canadian Institute of Chemistry, a full description of which, with a list of the original officers was published in our issue of 23rd April (see page 341).

The members of the Institute now number 140 qualified chemists.

Prof. Neish, of Queen's University, Kingston, who returned to Canada last August after nineteen years absence in New York, gave to the meeting his impressions of Canada upon returning home. Speaking at the dinner with which the proceedings were concluded, Prof. Neish said Canadians were ultra-conservative, and did not take advantage of their opportunities as they should do.

### PROSPECTING IN BEATTY TOWNSHIP.

Some years ago many discoveries of gold were made in Beatty township, east of Matheson. Development was started on several properties in the vicinity of Painkiller lake. The great fire of 1916 destroyed the plant and buildings over a wide area and prospecting was discontinued for some time.

There is now again some activity in this district. At the Hill mine about 20 men are working and drifting is in progress at the 200 and 250 ft. levels. At the Cartwright Goldfields property camp buildings have been recently erected on the northern claims and surface prospecting is being systematically carried on. This company lost mining and milling plants in the fire of 1916.

It is said that development work is to be resumed this week at the Hattie property.

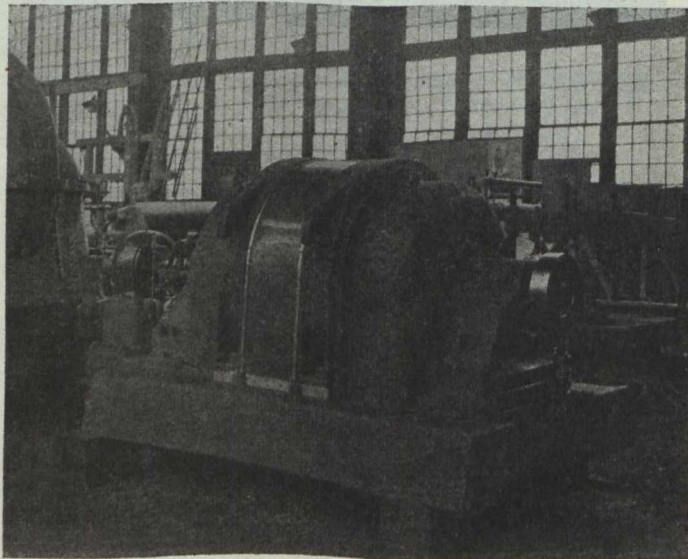


Fig. 6 (see page 460). 400 K.W. Alternator, built by Dominion Bridge Co.



# The Turbo-Blower Installation at the Blast Furnaces of the British-America Nickel Corporation, Sudbury, Ont.

The following sketch Fig. 1 shows the arrangement of an interesting turbo-installation built in its entirety by the Dominion Bridge Company at Lachine, Que. to deliver air for the blast of the furnaces in which the nickel ore mined by the British-America Nickel Company at Sudbury is reduced to a matte for further treatment at the Refinery at Deschênes, Ottawa.

The extent to which the Dominion Bridge Company has engaged in the manufacture of steam-driven turbine machinery is not widely known, and it will probably be a surprise to many Canadian readers to know that this very compact and workmanlike unit was built, including the alternator, in the Bridge shops at Lachine. This department of the Bridge Company's activities is entirely distinct, and is in addition to the manufacture of water-driven turbines and paper-making machinery in which the Dominion Engineering Works engaged at the Rockfield shops.

In the British-America Nickel Company's blower unit, the five machines in continuous alignment consist of two groups.

At the left, a high-pressure steam turbine drives a 500 k.w., 60-cycle, 3-phase generator in tandem with

a 30,000 cu. ft. blower, delivering air at about 36 ozs. per sq. inch.

The two remaining machines consist of a steam turbine connected to another blower of the same capacity as the first-named.

Under normal operating conditions, the blast is supplied by the last-named blower, but in the event of trouble on the outside transmission line, the other turbine and generator and the blower connected to them are put into operation, and the other blower is shut down.

By taking out the coupling bolts between the turbine and generator, the generator can be run as a synchronous motor at 3,600 r.p.m. to drive the blower next to it.

Each turbine is equipped with its own surface condenser, and condensate-removal pump. The steam-jet air-evactors, however, are grouped in a battery, and withdraw air from a trunk airline with branches to each condenser. This arrangement has been found to be very convenient in practice, as it makes the evactors interchangeable, and enables some to be shut down at light loads. The evactors also discharge into a common line; the outlet from which is submerged

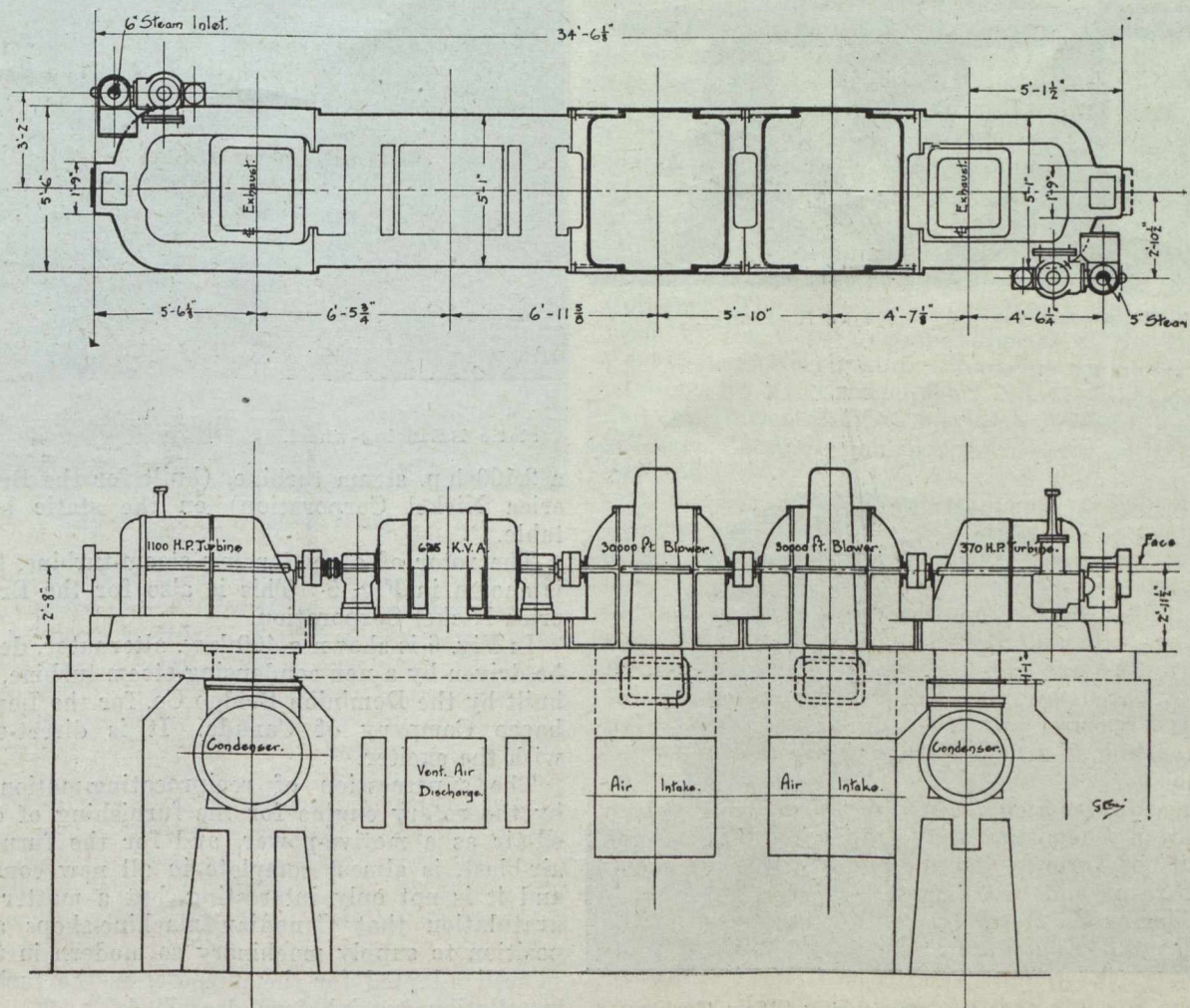


Fig. 1.



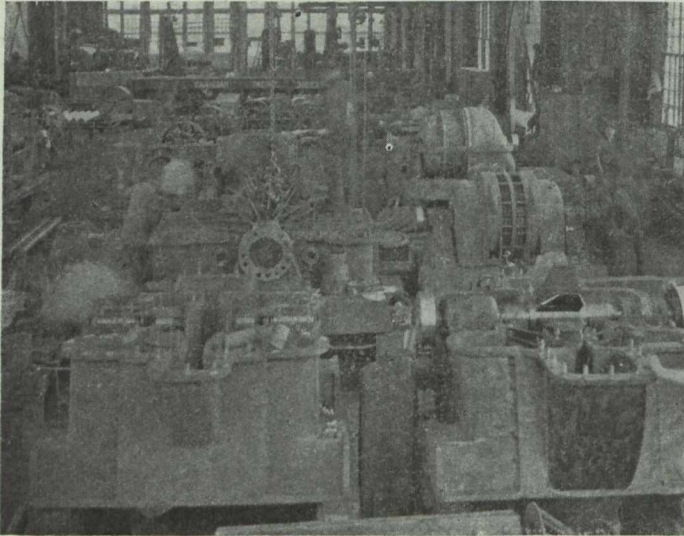


Fig. 2. Blower Installation under construction.

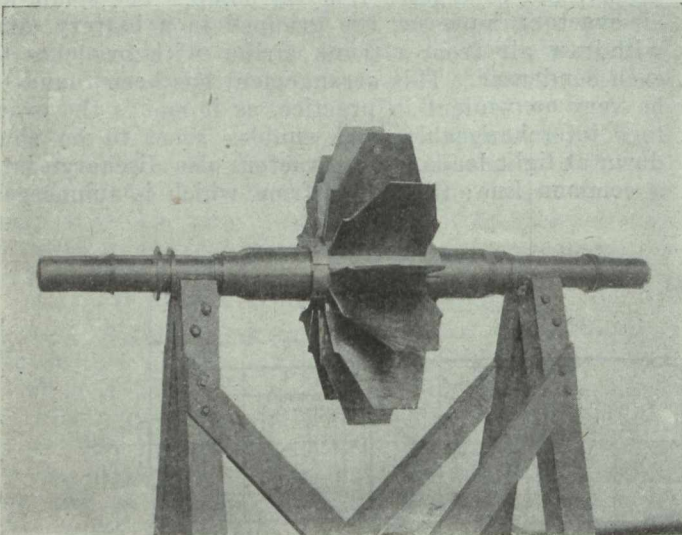


Fig. 3. Impeller for 30,000 c. ft. Blower.

in a tank through which the condensate is pumped, the water being thereby raised in temperature, and the heat units remaining in the evacuator steam conserved.

The air pressure delivered by these blowers is determined with certain limits by adjustment of the pressure regulators connected with the governor valve of each turbine. When once set, the turbo-blower will continue to give air at the desired pressure without further attention.

Fig. 2 shows the blower installation in course of erection in the shops. In order from the foreground may be seen the following component parts of the unit, namely, the blowers, alternator and steam turbine. Fig. 3 shows the impeller for the 30,000 cu. ft. blower. The design of this impeller, the blades of which are securely slotted into the shaft, ensures complete freedom from vibration and an absence of end-thrust. The turbine machinery is all made under the Rateau-Smoot patents.

Fig. 4 is a photograph of a low-pressure wheel for

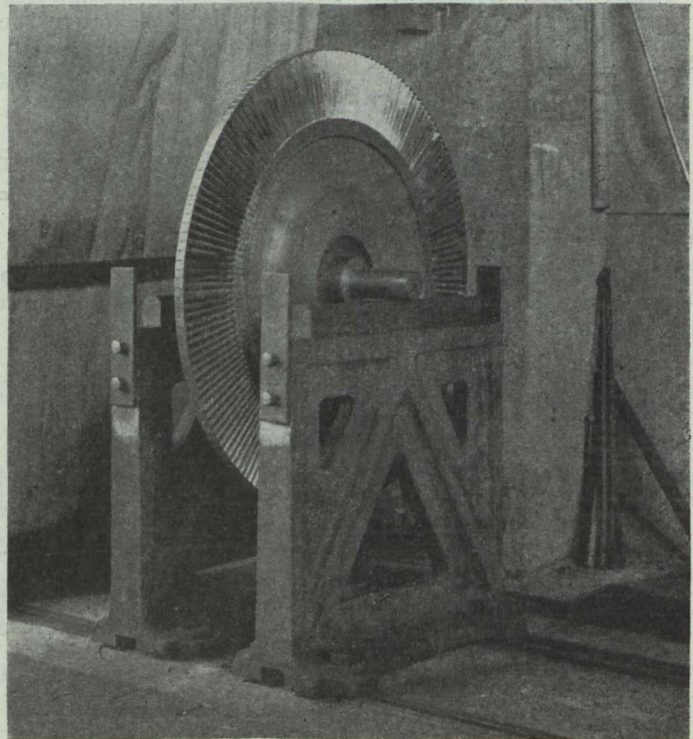


Fig. 4. Low-pressure Wheel of 2,100 h.p. Steam-turbine on static Balancing-wheel.

a 2,100 h.p. steam turbine, (built for the British-America Nickel Corporation) on the static balancing-table.

The rotor of a condensing steam-turbine, 2,100 h.p. is shown in Fig. 5. This is also for the British-America Nickel Corporation.

In Fig. 6 is shown a 400 k.w. alternator, designed to be driven by a non-condensing steam-turbine, that was built by the Dominion Bridge Co. for the Imperial Tobacco Company of Canada. It is direct-connected with the exciter.

The supersession of reciprocating-motion engines by the rotary engine for the furnishing of compressed-air as a motive-power, and for the furnishing of air-blast, is almost complete in all new construction, and it is not only interesting, but a matter for congratulation that Canadian machine-shops are in a position to supply machinery so modern in type, and so well adapted for the purpose, as the turbo-blower installation hereinbefore described.

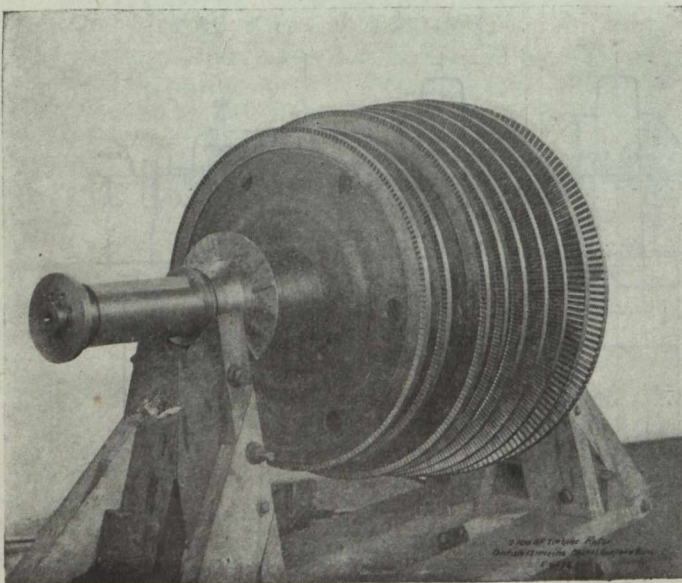


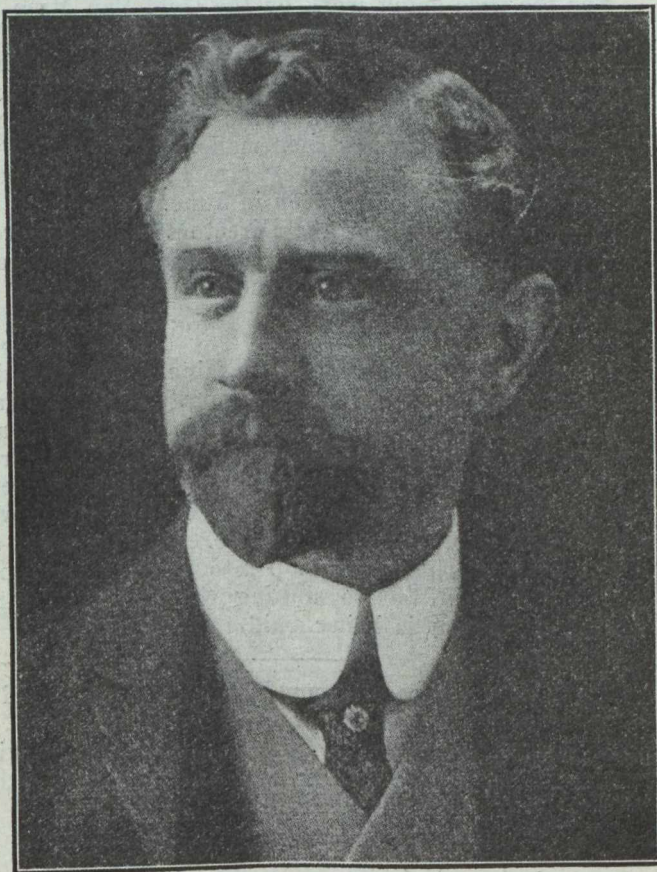
Fig. 5. Rotor of 2,100 h.p. Condensing Steam Turbine.



**G. G. S. LINDSEY**

Mr. G. G. S. Lindsey died at his home in Toronto on Thursday, May 27. He was well known among mining men, not only in Canada, but also in other parts of the world, and it is with great regret that they will learn of his decease. He was also prominent as one of Toronto's leading lawyers and had a wide acquaintance among members of that profession. By many others he was known as one of the shining lights of the Liberal party for he was a strong supporter of that party until the conscription issue came up and he left the old party to campaign for the Union Government and conscription. In his younger days Mr. Lindsey was known to many as an enthusiastic sportsman and as a cricketer especially.

As a student at the University he found time not only for studies and athletics, but also for journalism and he founded the publication "Varsity," which has from that time been the organ of the Varsity students.



THE LATE G. G. S. LINDSEY.

Mr. Lindsey had long been interested in mining affairs. Though by profession a lawyer he had experience as mine operator, and was for some years general manager of the Crow's Nest Pass Coal Co., one of the largest coal mining enterprises of Western Canada. His experience as a lawyer and miner made him practically well informed on mining law and he was a recognized authority. He always did his part to further any effort made to improve laws and regulations governing mining in various parts of Canada.

Mr. Lindsey was one of the best known and best liked members of the Canadian Mining Institute. He took an active part in Institute affairs and served on the Council for several years. He also gave his services to the Institute in legal matters at all times. In 1915 he was President of the Mining Institute. In

1915 his business took him to China where he carried on negotiations with the Chinese Government for English mine operators. He found there a difficult situation owing to the fact that the Chinese Republic had no mining code. He was delayed much longer than he expected owing to the fact that he was recognized by the Chinese Government as a man who might draft a suitable mining code. He undertook the work and when he returned to Canada he had framed the mining code of the Chinese Republic.

Mr. Lindsey took an active part in the campaign for conscription, and in other war work during recent years. Latterly he had been physically unfit for great activity and he had been unable to take his usual active part in mining affairs during the past two or three years.

Mr. Lindsey's life was an active one and he crowded into it more work and more experiences than come to most men. He leaves behind him a host of old friends.

R. E. H.

**NOVA SCOTIA NOTES.****Dominion Coal Company.**

An official announcement is made that Mr. E. P. Merrill is appointed General Manager of the Dominion Coal Company and the Dominion Iron and Steel Company and subsidiaries, and will reside in Sydney.

The new shaft, situated between Collieries Nos. 1 and 2, has reached the Phalen Seam. The sinking has been done under contract by the Foundation Company, whose work is now completed. The completion of this shaft will save much underground travel, and will assist in the ventilation and pumping of the Phalen workings in this district.

The unwatering of the Morien Colliery is approaching completion, and construction men are at work on a re-arrangement of the surface plant.

The Surface plant of the Hub Colliery has been dismantled, much of the equipment having been utilized at No. 17 Colliery (New Waterford.) Other portions of the Hub Plant, including the boilers, will be removed to Morien Colliery.

Much underground work has been done at No. 17 Colliery. The proportion of undersea coal now drawn upon by the Cape Breton Collieries of the Dominion Coal Company is striking. Counting the newly operated mines No. 24 (Emery Seam), No. 17 (Victoria Seam) and the Morien Colliery, the Company now has eleven submarine collieries and six land collieries in the Sydney Field.

A number of scattered stoppages of work arising from local dissatisfaction with rates and mining conditions have recently taken place in the Dominion Collieries. The men appear disinclined to allow their union officials to act for them, and, upon very slight occasion, cease work. Difficulties of this kind have taken place over the rates of landing tenders, over the question of new pit-boxes at the Springfield Collieries, and in other instances.

Discomfort and danger has been experienced at various mining centres in the Maritime Provinces through forest fires. At New Waterford, in Cape Breton, and in the vicinity of the collieries at Springhill, Joggins, Maccan and River Hebert, in Cumberland Co., much damage has been done.

An impression appear to have been general, and certainly a despatch appeared in the newspapers purporting to come from Ottawa, that the Industrial Disputes Act was being amended to allow of collective



adjustment by a Conciliation Board of wage questions affecting more than one company and its employees. It was rather difficult to understand how such an arrangement was possible, in view of the spirit and intent of the Industrial Disputes Act, but, under the impression that such an arrangement was possible, the Executive of the U. M. W. in Nova Scotia requested of the Minister of Labour that collective adjustment of their common demand upon the Nova Scotia coal operators for a 27 per cent increase at May 1st should be attempted by a Conciliation Board having wide powers. The Minister of Labour has replied stating that such a proceeding is not possible under existing legislation.

The U. M. W. officials state they will press the new demand, and it is stated, by a Cape Breton newspaper, that the Secretary has advised the miners to reduce their output by one-half if the new wage demands are not conceded.

The Wage Scale Committee of the U. M. W. is in session at Halifax, and it is probable that the new demand will result in another series of Conciliation Boards.

In view of the recommendation to reduce output it may be noted that coal production in Nova Scotia is even yet thirty per cent below pre-war outputs, and the statement was recently made by the General Superintendent of the Dominion Coal Company, that "We cannot mine enough coal to handle the St. Lawrence trade." In June 1914 the output of the Dominion collieries in the Sydney Field was 452,000 tons. It is unlikely to exceed 300,000 tons in June 1920.

#### PROPERLY DOMICILED

There is considerable press comment over the fact that the British Empire Steel Corporation has been incorporated under the Nova Scotia Joint Stock Companies Act, and that its head office is to be at Sydney. There should be nothing surprising in the circumstance that the big Corporation is to be domiciled here. "Where a man's treasure is, there his heart is also."—Sydney "Post."

#### MANITOBA LETTER.

By C. A. MILLICAN.

A Mining Syndicate has recently been formed to acquire the Falcon Mineral Claims at Turtle Lake in the Rice Lake District.

The interested parties are chiefly Winnipeg, Dauphin, and Gilbert Plains men. Mr. R. R. Pattenson, of Winnipeg is the Trustee.

These claims to the north and north-east of Turtle Lake were first staked by William Walton.

Two engineers, it is stated, have favorably reported on these properties, and a further report is to be obtained from a Professor of the University. If his report is equally favorable, a company will be formed to carry out active mining operations.

Work will commence on the Gabrielle Mine early in June. A party is being made up to proceed to the property via Riverton and Hole River—taking advantage of the water route, which will bring the men and supplies to within two miles of the mine. As soon as the shafts and drifts are de-watered, an inspection will be made by Mr. J. B. Tyrrell, of Toronto, who will advise the lines for future operations.

Active work on the Gold Pan Extension commenced on the first of May, employing two shifts. The Com-

pany is engaged in sinking and at last reports the shaft was down 80 feet. The vein measures about 4½ feet in width, with quartz over 3 feet showing high mineralization carrying sulphides and galena and some free gold. The work is being done on the vein, which has a slight dip to the north, but stands almost perpendicular. It is the intention of the Company to continue sinking, without doing much lateral work, to the 200 foot level. Good progress is being made and the directors are well satisfied with the showings so far.

Work on the government road from the Lower Bellevue Landing on Hole River is making slow progress. Word from the camp states that there are several log jams in the river between this point and Hole River Lake—which will have to be removed before this route can be used freely.

For the time being work on the Gold Pan Mine has practically been suspended. The drift is in 285 feet from the shaft following the vein, but the showings are not of a very encouraging nature, and there is not likely to be any more work done until a close inspection of the property has been made.

This will likely be done by Mr. Tyrell, when he is in the Rice River Lake region in June.

It is the intention of the Directors to have a very thorough examination made into the situation, and much will depend on the result of the pending inspection and report.

Word from the Commonwealth mine, received within the last week, is very encouraging. Test pits have been made on the main vein, which is 7 feet wide, and carries a well distributed showing of free gold across the entire width. Mr. Porter, the managing director has gone in to the mine, and expects to return with some nice samples of free gold ore. From present appearances this should develop into a really good proposition. In addition to sinking the test pits, considerable attention is being paid to stripping.

There is a prospect of much movement in the Rice Lake area this season.

Engineers are going in for the purpose of making examinations for interested parties and some further prospecting is being undertaken.

The fine weather of the last ten days has caused a more interested feeling in mining matters, and some very promising samples of ore are coming out. The writer looks for a healthy movement during the present year, and for some really good prospects to be brought to public notice.

Activity at Herb Lake is concentrated upon the Bingo, where a gang of miners are sinking a shaft to the 200-ft. level, and then to drift for 200 ft. Ten additional miners were sent up on yesterday's "Muskeg," ("Muskeg, Ltd." is the name given to the train that runs over the Hudson's Bay Line out of Le Pas.) and the machinery will be taken in at the end of the month, when the lake is expected to be free of ice. There is ample equipment on the ground to carry on with in the meanwhile.

The results of the sinking will be watched with interest. The strong gold showing on the surface in a promising series of veins has caused the owners to regard the property as a sure producer—(Pas Herald.)



### COMMISSIONER WALLACE RECOMMENDS SINKING TEST SHAFT FOR OIL IN DAUPHIN DISTRICT

In a report of the possibilities of the presence of oil in the Lake Dauphin district, made public today at the Parliament Buildings, R. C. Wallace, commissioner of Northern Manitoba, and former professor in geology in Manitoba university, recommended to the government that a drilling outfit be sent to that district, capable of sinking a shaft 1,000 feet in order to settle the question once and for all and make speculating impossible. Prof. Wallace's report covers several typewritten pages in which he goes into the arguments for and against the presence of oil in the district very thoroughly.

In concluding his report he states:

"The limestones of our province are not considered to be favorable for the collecting and retaining of oil pools. Sufficient work has been done in the southern part of the province to establish the fact that discoveries of oil are unlikely. In the north part of the province, from Dauphin northward, however, little work has been done. It must not be forgotten that it is now generally agreed that the last possibility for oil in the Canadian west is in the limestones of a similar age in the Mackenzie basin."

"Two points must be definitely established and it is impossible at the present stage to establish anything further: (a) That the oil is a natural oil and had not in anyway been faked. From enquiries made rather carefully in Dauphin and from the result of analysis made by Milton-Hersey company—my opinion is that the well has not been salted.

(b) The oil must be found to issue vertically through the four feet of limestone which was opened up at the bottom of the claim and not laterally from the surface of the limestone. If the oil is coming in from the bottom of the four feet of limestone the probabilities are small that it is connected in any way with the shale deposits of the Riding Mountains, part of which is oil bearing."

Prof Wallace in his accompanying letter recommends that the government clear up the two points definitely before commencing operations. He recommends that the Hugh McNair, of the Public Utilities Commission who was named by the legislature as the other expert to co-operate with Prof. Wallace in making a report on the oil deposits, be asked to do this work. So far the government has not received any report from Mr. McNair.

Prof. Wallace, together with Hugh McNair, engineer of the Public Utilities commission, was appointed by the legislature to make a thorough survey of the Dauphin district with regard to oil.

This action was taken as a result of the many conflicting reports given publicity concerning large oil deposits there. In digging a well, it is reported, oil was found and this is the well which is referred to by Prof. Wallace. It went to a depth of four feet in the limestone. The legislature ordered that if the report of the commissioner and his assistant was favorable, the department of public works should purchase a drilling apparatus capable of sinking a shaft 1,000 feet in order to permanently establish the presence or absence of oil.

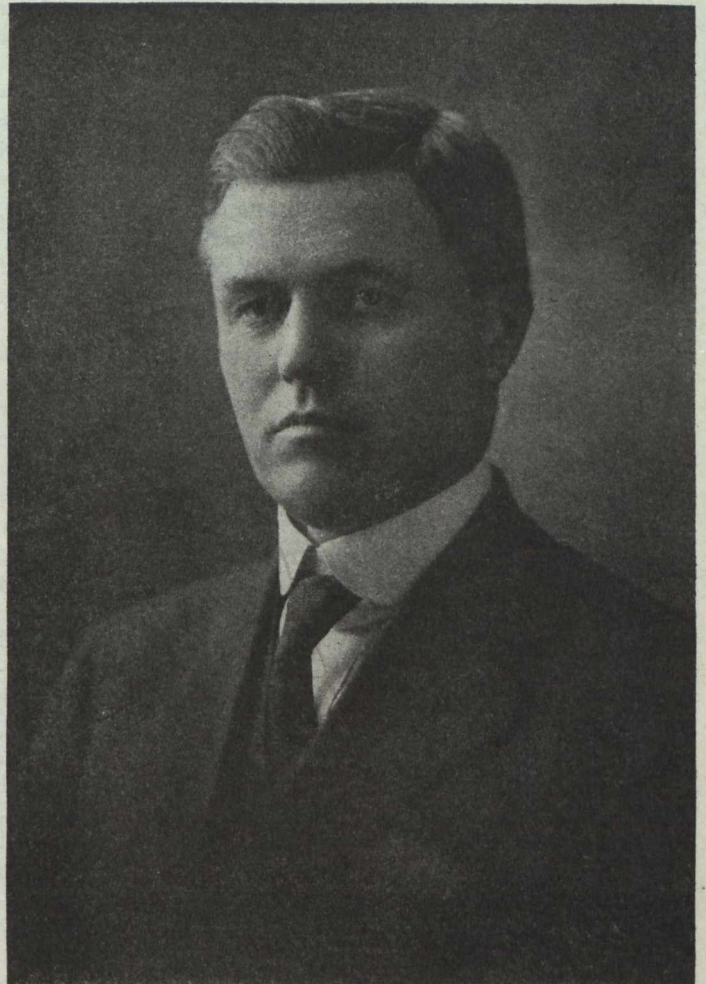
Prof. Wallace in concluding his report continues: "If conclusive evidence is obtained on both these points I am of the opinion that the government should entertain the expense of putting down a test hole at the

well itself. While no one who knows the situation well can feel enthusiastic at the present moment in regard to the possibilities of oil reservoirs in this district, yet the importance of oil is so very great that its possibilities even if merely possibilities should not be overlooked. There is another reason which is in itself important. Direct action by the government will go far to prevent unlimited speculation which is at any time possible where evidences of oil are reported.—"Free Press," Winnipeg.

### R. C. WALLACE TO CONTINUE AS COMMISSIONER OF NORTHERN MANITOBA UNTIL SEPTEMBER, 1921.

It was officially announced by a member of the provincial cabinet today that Commissioner R. C. Wallace, of Northern Manitoba will continue to hold the post despite former announcement as to resignation. The government has completed arrangements to retain his services until Sept. 1, 1921.

Commissioner Wallace was loaned to the provincial government by the University of Manitoba, where he filled the post of professor in geology. As commissioner of northern Manitoba he is the administrator of law in a vast unopened tract of country. As a professor of geology his knowledge has been of inestimable value in connection with the mining industry which is opening up the northland.



Mr. ANGUS W. MACDONALD,  
Welfare Supt. and Employment Agent, Dominion Steel  
Corporation, Sydney, N.S.



**OUR NORTHERN ONTARIO LETTER.**

**THE SILVER MINES.**

Announcement is made in Cobalt that despite the decline in quotations for silver, the mining companies will continue to pay their employees the bonus of \$1.25 a day, just as though the price of silver had remained at over \$1.20 an ounce. This brings the schedule to a level with that of the International Nickel Company and is likely to stop the exodus of miners which has been going on for the past few weeks. The agreement made last Autumn with the men was that the wage should be from \$3.50 to \$4.00 a day, plus a bonus of 25 cents a day when silver averaged 80 cents an ounce or over, plus an extra 25 cents a day for each ten point advance in silver above 80 cents an ounce. On this basis, the bonus amounted to \$1.25 a day when silver averaged over \$1.20 an ounce as during March and April. At the same time, the May rate would be only 75 cents a day bonus on account of silver having declined to below \$1.10 an ounce. Not only has it been announced officially to the "Journal" that the full \$1.25 bonus will be paid for May, but this rate is definitely promised for at least six months.

During the closing week of May, therefore, with the labor question stabilized by the timely action of the companies, and the price of silver strengthened, a prosperous period seems likely. It is to be noted, also, that selling silver in New York and receiving payment in New York funds, receipts are increased by some 12 or 13 per cent. by the premium on New York funds, making the price \$1.15 an ounce for silver produced in Canada.

The McKinley-Darragh has declared a regular quarterly dividend of 3 per cent., payable July 1st. The disbursement will amount to \$67,428, and make a total of \$5,821,591 paid to date by this company. This is equal to 262 per cent. on the company's issued capital. It is expected the financial statement which will accompany the dividend cheques will show a surplus of around \$450,000 to \$475,000 as compared with \$474,864 as of the previous quarter.

On May 24th the Beaver Consolidated disbursed a 3 per cent. dividend, the first in some three years. It is believed probable that disbursements will now be made at reasonably short intervals, owing to the company having been relieved of the financial burden of paying the way of the Kirkland Lake Mine which the Beaver controls. In the past three years the Beaver paid out over \$750,000 in developing and equipping the Kirkland property, which only within recent months has paid its own way.

The Coniagas Company has a force of men engaged in erecting camps and clearing a road to the Gamble-Thompson property in the Gowganda district. The claims are held under a working option agreement, with a certain amount of work to be done monthly.

It is noted that bonds which the Northern Light Railway are to issue will bear interest from June 1st., which is pointed to as an indication that it is proposed to carry out the construction work immediately. The work of surveying the route from Elk Lake to Gowganda is being continued, and it is stated that a very suitable grade will be established.

Harry Stewart, manager of the Crown Reserve Mine has been appointed a director of the Canadian-Kirkland Gold Mines. This property is held under option to the Crown Reserve Company, and the new option-

ment was made to fill the vacancy caused by the resignation of R. W. Brigstock. The annual meeting of the Canadian-Kirkland is to be held within the next few weeks, notice of which will be sent out in due course.

As regards the question of arrangements to treat the large dumps on the Kerr Lake mine, nothing of an official nature has so far been announced, although it is believed that suitable terms will eventually be agreed upon. The dumps are estimated to contain something like 75,000 tons of material of low silver-content, but believed as likely to be workable at a fair margin of profit.

The Coniagas Company has made arrangements to treat approximately 40,000 tons of tailings by cyanidation in the Buffalo mill of the Mining Corporation. The lease covers only the cyanide equipment of the Buffalo mill and does not include the flotation.

**Ore and Bullion Shipments.**

During the week ended May 28th, three Cobalt companies shipped an aggregate of eight cars containing approximately 646,251 pounds of ore. The Nipissing alone sent out five cars. Following is a summary:—

Shipper	Cars	Pounds
Nipissing . . . . .	5	434,390
Mining Corporation . . . . .	2	129,659
McKinley-Darragh . . . . .	1	82,204
Totals . . . . .	8	646,251

During the week, the Nipissing and the Mining Corporation were both heavy bullion shippers, and sent out a total of 299 bars containing 351,570.03 fine ounces.

Following is a summary:—

Shipper	Bars	Ounces
Nipissing . . . . .	149	201,156.53
Mining Corporation . . . . .	150	150,413.50
Totals . . . . .	299	351,570.03

**THE GOLD MINES.**

Higher wages at the gold mines is perhaps the chief announcement during the week in connection with the industry. While this announcement comes only from the Hollinger Consolidated, yet with the requirements of this one mine being almost as great as all the other gold mines of the Province combined, it indicates that other companies must also meet a similar schedule. Loaders are offered \$4.72 and machine runners \$5.28 for 8 hours work. The new scale compares with \$4.75 and \$5.25 at Cobalt and is also about equal to that being paid by the International Nickel Company at Sudbury.

It is believed that with gold mining likely to prove one of the steadiest industries in the country during the period of reconstruction, and probably destined to flourish most when other industries are confronted with depression, they may now be a tendency for men to find their way in greater numbers to the gold-mining camps of the North. The present appears to be an opportune time to establish themselves in the gold-mining centres, and to thus be freed from the uncertainty of conditions in other centres where a break in present wages appears likely due to effort being directed toward the manufacture of luxuries instead of the provision of necessities, such as we consider gold to be.



Advance information to the correspondent of the "Canadian Mining Journal" would suggest the belief that the coming annual report of the Dome Mines Company will be exceedingly favorable. It is known that the company commenced its fiscal year on April 1st., 1919, with a surplus of only \$56,000 and that about two months later this had been reduced to almost nothing. However, at that time the mill was put into service, and it is learned that the annual report will show a net profit of around \$650,000 during the last ten months of the year ended March 31st., 1920. In addition to this large net profit, the company is stated to have written off close to \$250,000 for deferred development, plus about \$200,000 for depreciation. The fact, therefore, is, that despite the adverse economic conditions, and being forced to operate at only two-thirds capacity, the Dome realized net profits amounting to about twenty per cent on its issued capital in the ten months during which the mill operated. Mill heads are stated to have averaged over \$6.50 a ton, while the total costs, inclusive of the large amount written off for depreciation and deferred development amounted to only between \$3.50 and \$3.60 to the ton. The achievement is believed to be one of the best recorded in the history of mining in Canada.

At the annual meeting of the Porcupine V.N.T. held May 27th, it was decided not to resume work until such time as workmen are plentiful. It was stated, however, that all is in readiness to commence work just as soon as the labor supply becomes satisfactory. This is taken as an indication that harmonious conditions have been established among the directors and that the course to be adopted will be governed by conditions other than lack of inside cohesion.

The Hollinger Consolidated has declared a dividend of one per cent payable June 16th to shareholders of record June 14th. The disbursement will amount to \$246,000.

Announcement is made by the Ontario-Kirkland Gold Mines that lateral work at the 450-ft. level has opened up the downward continuation of ore bodies developed at the 300-ft. level. It is stated that ore will average about \$16 to the ton at the point where encountered. Further work is proceeding, and it is planned to reach a decision during the next month as to the size of the mill required so as to proceed with the work of installation at as early a date as possible.

A delay has occurred in connection with the reopening of the Tough-Oakes, and work may not actually resume for another week or so, according to official advice. It is felt that the process of resuming work will be gradual on account of the difficulty to secure men.

The Crown Reserve Mining Company, holders of an option on the Candian-Kirkland has commenced to de-water the shaft on the latter property. This is considered as particularly significant owing to the fact that underground work was discontinued some weeks ago, and that effort has since that time been concentrated on diamond drilling. It is believed that drilling results has encouraged further underground work.

It is reported at Boston Creek that the Ontario Government has decided to build a bridge over the Blanche River to accommodate the prospectors and mining companies engaged in exploration and development work in the Skead township gold area. This will encourage traffic to Skead by way of Boston Creek

and will reduce the distance from the railway by fifty per cent.

Dan Smith has been granted a contract to sink two 50-ft. shafts on the property of the Better 'Ole Syndicate, near Bourke's Siding. The syndicate is composed chiefly of returned men, some of whom are disabled. It is their aim to put forward an earnest effort to develop a mine, for which purpose the syndicate was formed. The work is already well under way.

The suggestion in Washington that Canada could be compelled to export pulp wood to the United States by threatening to cut off her coal and sulphur supply has aroused considerable interest in Northern Ontario. The question of a solution of the coal problem is believed to lie with Eastern as well as Western Canada, but sulphur is a matter of much local interest in this district where large iron-sulphide dykes await development. These dykes occur in Porcupine, Swastika, Skead and other parts of the district of Temiskaming, and in many cases the percentage of sulphur is said to exceed forty per cent. The importance of the chemical is realized when it is pointed out that it takes from 250 to 300 pounds of sulphur to make a ton of sulphite, and paper consists of about 20 per cent. sulphite. Light thrown upon the subject may reasonably lead to lively interest in the large sulphide deposits awaiting development.

#### BRITISH COLUMBIA LETTER.

##### The Metal Mines. Vancouver, B.C.

By the staking of mineral claims within the municipality of Point Grey and demanding that he be given title under the Mineral Act, James Adair, a prospector, has presented the Provincial Government with a problem that promises to be difficult of solution. Mr. Adair asserts that he has a good showing of ore in a section the residential property of which has given property considerable value. The terms of the Act, it is said, have been fully complied with but Mr. Adair's application for the completion of the record has not yet been approved. He declares that it is his intention to press the matter so that it is possible that the courts may have an interesting point to settle.

Oscar Lachmund, consulting mining engineer of Spokane, Wn., and formerly general manager of the Canada Copper Company, announces his intention to leaving for the Orient next month on professional business.

##### Stewart, B.C.

There seems to be some foundation for the report that the line of Railway up Bear River in the Portland Canal district, is to be repaired and operated this summer. The Algonian Development Co., Ltd., is reported to have made an arrangement with the Canadian Northeastern Railway Company under the terms of which the long deserted line will be put in shape and used for the transportation of supplies and equipment during the season. The work involved reconstruction of the Bitter Creek and Bear River bridges, clearing a right of way etc. Tenders are being called for.

The Northern Light property is actively under development diamond drilling is to be undertaken as soon as weather conditions render it feasible. Five thousand feet in this work is contemplated.

There has been much activity in the transport of supplies to the Spider property, Salmon River. Hauling was done on Yukon sleighs. A temporary camp



has been established and a compressor-House is under construction. A three-drill compressor and engine is being installed, it is expected, will commence in a few weeks.

**Alice Arm, B.C.**

It is altogether probable that at the time of writing (May 25th) work will have been resumed on the Dolly Varden Mine and Railroad. Some weeks ago the miners and employees on the railroad went on strike, their demands being of such a character that the management felt they were beyond reason. A statement was made that the walk-out was engineered by the O. B. U. Since then, successful efforts have been made to obtain members of the International Union at lower coastal points, for employment on the plant and at the mine. These men have gone north and no doubt now are at work.

**Trail, B.C.**

Receipts of ore and concentrates at the Trail smelter have passed the hundred thousand ton mark. During the week ending May 14th, 5,345 tons of ore and concentrates were received. This brings the total for the year up to 104,086 tons.

Three returned soldiers, who took the special Soldiers' Civil Re-Establishment Assayers' Course in connection with the B. C. University, passed the B. C. Board's examination recently at Victoria. They are M. J. Bajus, Vancouver; S. E. Okell, New Westminster; and C. S. Gardner, Victoria.

**The Collieries.**

While definite figures cannot be given as to the coal production of British Columbia for the month of April because of the lack of returns from the Crow's Nest Pass Field it would appear, from statistics available, that the output of the collieries has fallen off slightly. Companies which show a decline in comparison with March are the Fleming Coal Co., of the Nicola-Princeton District; the Canadian Western Fuel Co., the Canadian Collieries (D) Ltd., at Extension and South Wellington, and the Pacific Coast Coal Mines. Those which have increased production are the Princeton Coal and Coke Co., of the Nicola-Princeton District; the Canadian Collieries (D) Ltd., at Comox; Wellington-Nanoose Collieries, and the Granby Consolidated Mining and Smelting Co. at Cassidy, Vancouver Island. The growth of the latter's output is one of the features of the trade. For some months it has been steadily mounting, an indication of the adoption of a policy of the development to the fullest extent of the Island fields recently opened up by the Company.

The returns in detail follow:—

**NICOLA-PRINCETON FIELD.**

	Tons
Fleming Coal Company . . . . .	2,352
Princeton Coal and Coke Co. . . . .	1,267
<hr/>	
Total . . . . .	3,619

**VANCOUVER ISLAND FIELD.**

	Tons
Canadian Western Fuel Co., Limited . . . . .	54,019
Canadian Collieries (D) Ltd., Comox . . . . .	35,139
Canadian Collieries (D) Ltd., Extension . . . . .	15,853
Canadian Collieries (D) Ltd., S. Wellington . . . . .	7,076
Pacific Coast Coal Mines . . . . .	9,332
Wellington-Nanoose Collieries . . . . .	2,015
Granby Consolidated Mng. & Smelting Co., Cassidy . . . . .	18,421
<hr/>	
Total . . . . .	141,855

**Pacific Coast Coal Mines, Ltd., to Enlarge Production**

On assuming the position of General Superintendent of the Pacific Coast Coal Mines, Ltd., George Wilkinson, late Chief Inspector of Mines for British Columbia, announces that his Company has adopted a plan for the development of its Vancouver Island coal properties that will mean the expenditure immediately of some \$500,000. Already the Company has invested over \$2,000,000 in the opening up of its Morden Mine which is fed by 1,600 acres of coal bearing land, there being three seams known as the Douglas, Newcastle and Wellington. The plant is thoroughly modern, the pit head and screening plant being constructed of steel and reinforced concrete. It is about five miles from the mine to the shipping point at Boat Harbor, transportation being furnished by a standard gauge railway. At Boat Harbor bunkers have been erected with a capacity of 5,000 tons and washing plants also have been installed. The loading is done by a conveyor of a capacity of 750 tons an hour. The Morden Mine now is producing about 400 tons of coal a day and it is expected that the daily output will reach 1,000 tons by the end of the year. It is estimated that the area held by the Company at this point will yield a quarter of a million tons a year for ninety years. The first work in connection with the Morden property will be the construction of officials and workmen's houses, sixteen acres of land having been purchased on which will be constructed excellent living quarters. The Squash holdings of the Pacific Coast Coal Mines, Limited, are situated on the east coast of the Island, on Broughton Straits opposite Alert Bay and at the entrance to Queen Charlotte Sound, about 200 miles north of Nanaimo. The coal field there is one of the largest undeveloped proved areas on the Pacific Coast and the company owns some 10,000 acres of it. Three workable seams have been located at a moderate depth. The mine workings on the second seam now are developed to a point where from 300 to 400 tons daily can be produced when a second opening is made and permanent shipping facilities are provided. Mr. Wilkinson is of the opinion that Squash is to become one of the largest coal centres of the Pacific Coast from the standpoint of production and estimates that employment ultimately will be given 2,000 men. If the coal seams run evenly and consistently over the whole area, as appears to be indicated by drilling and other development, the company will have sufficient coal here to yield half a million tons a year for two hundred and sixty-four years. The Squash Mine was closed down with the beginning of the war but Mr. Wilkinson states that it is the intention to resume operations there without delay. Some 200 men will be employed without delay. As development proceeds modern plant will be installed, and it is believed that, as the coal is comparatively



hard and well adapted to domestic use, it will not be long before the product wins popularity among the consumers of the northwest.

The coal product of the Nicola-Princeton Field of British Columbia has been attracting some attention of late and, if reports from responsible quarters are to be credited, there is to be considerable new development in that section. The Harvard Coal Co., of Princeton, recently sold some of its product in Spokane, Wn. and it is said to have given satisfaction and to have been marketed at a price that proves it can be shipped across the line and successfully compete with the output of Washington State Mines. The property of the Coalmont Collieries, Ltd. also is to be extensively developed, a bond issue of \$600,000 having been floated among Vancouver City and Calgary citizens to supply the needed finances. A tramway is to be constructed for a distance of two and a half miles between the Kettle Valley Ry. to the mine shaft, and quarters will be provided for officials and men at the mine. This work will be prosecuted with vigor during the summer to the end that transportation facilities may be available to permit a much larger production than the present to be placed on the market at Vancouver and elsewhere next winter.

A determined counter-offensive is being waged by the United Mine Workers of America against the O. B. U. in the Crow's Nest Pass coal field. The Miner's Hall at Fernie has been seized by the U. M. W. of A., so that that organization again is in possession of its old headquarters. Locals are being re-organized at Fernie, Michel, Natal and other centres with, it is stated, considerable success.

In order to better co-ordinate the coal mining industry in the Province of Alberta from the viewpoint of the operators an amalgamation has been effected which will bring under the jurisdiction of the Western Coal Operators' Association six sub-district organizations, including the Red Deer Valley Coal Operators' Association. While each sub-district will deal with questions inside its own association, all matters of policy will be referred to the Western Coal Operators' Association. The officials of the new organization are: President, O. S. Whiteside; first vice-president, Jesse Gouge; second vice-president, John Shanks; secretary-treasurer, W. R. McNeill.

In an effort to meet the situation caused by the attitude of American coal operators, and in response to an appeal from the Manufacturers' Association of Toronto, Ont., the Boards of Trade of Western Canada at a recent conference passed the following resolution:

"That every effort possible be made to increase the area of use of Western Canada's Coal, and that this conference favours the investigation of freight rates on coal from Western Canada to the manufacturing centres of western Canada to the manufacturing centres of Ontario, with a view to making Canada independent of any other country in its fuel supply.

"And that the Canadian Pacific and the Canadian National Railways be asked to give special rates for the summer haulage of coal from Western Canada.

"And further that the coal operators be requested if they have not already done so, to make special summer prices for the sale of this fuel."

## BRITISH COLUMBIA HAS DEFINITE POLICY TO ENCOURAGE IRON AND STEEL INDUSTRY. Ore Areas to be Examined and Reservations Effected

(By Our Victoria Correspondent)

F. J. Crossland, mining engineer of Vancouver, B.C., has been appointed to make a thorough inspection of the hematite and limonite deposits of the Whitewater River section of the Clinton Mining Division. Hon Wm. Sloan, Minister of Mines, has commissioned him to ascertain, as far as possible in one season's work, the tonnage of this mineral available.

In an address before the last session of the Legislative Assembly Mr. Sloan spoke of a report received from Wm. M. Brewer, Government Mining Engineer, on these deposits which estimated that they afford a possible 50,000,000 ton reserve of limonite of good quality, eminently suitable for fluxing with the magnetic ores of the coast in the production of pig iron by blast furnace, and so situated as to be easily recovered. The Minister then stated that it was his intention to have the district well explored and Mr. Crossland's engagement is in line with that undertaking.

This Provincial Government work is to be supplemented by the Geological Survey Branch, Ottawa, which will have two parties in the field. One, under J. D. McKenzie will make a geological survey of the Taseko (Whitewater) Lake area and the other, under C. H. Freeman, will conduct a topographical survey.

Notice has been given, also, that a reserve, as authorized by a recent amendment to the Mineral Act, has been placed on the drainage area of the Taseko (Whitewater) Lake, Chilko Lake, Tauniah, Chilquoit and the Chilko River and Big Creek, Clinton Mining Division. This reserve takes effect on the 1st of June. Claims already recorded will not be interfered with but all open iron showings within the limits defined will be held by the Crown until it is determined how far they may be needed for the encouragement of the industry.

## BRITISH COLUMBIA COPPER OUTPUT PROMISES IMPORTANT INCREASE

(By Our Victoria Correspondent)

The announcement that the Consolidated Mining and Smelting Company, proposes becoming one of the large copper producers of the Province of British Columbia has occasioned much interest and speculation. The Company it is found, has been laying the foundations to this end for some time. It has two large copper deposits in Vancouver Island under development, one being the Old Sport, situated on Elk Lake near the southeast arm of Quatsino Sound, and the other the Sunloch, at Jordan River not far from Victoria. Through surface work, diamond drilling, etc., some 1,500,000 tons of copper ore approximateing 1.8 per cent, have been proved on the former property and it is authentically reported that reconnaissance surveys have been made of a number of railroad routes to tidewater. The Company recently acquired control of the Sunloch where it is estimated that 2,500,000 tons of proven ore, averaging between 1 and 2 per cent copper per ton, have been blocked out. The big Interior group also has been bonded. It is situated at the head of the Great Central Lake at an altitude of 6,200 feet. This season's work will consist of the securing of all possible information regarding its possibilities, the topography and geology of the area being investigated with a view, it is understood, of es-



establishing the practicability of attacking the deposit from about the 1,500 foot level. If this can be done the problem of making the mine will be much simplified. As to transportation, the E. & N. Railway is to be extended from the town of Alberni to the south end of the Great Central Lake so that it will be a matter of running the ore down the mountain side to the water, loading it in scows for transport over water for 22 miles and dumping it in railway freight cars for removal to the point selected for treatment.

While on the subject of Vancouver Island mineral development it may be said that the Tidewater Copper Company at Sydney Inlet is proceeding with the opening up of its deposits with satisfactory results. There are at least 500,000 tons of 1½ to 2 per cent of copper ore proven in reserve with good prospects of larger quantities being shown as work continues.

Neither the Cranby Consolidated Mining and Smelting Co., Hidden Creek, nor the Britannia Mining Company are working up to capacity at present. In the old workings of the Britannia, Howe Sound, it is roughly estimated that there are 9,000,000 tons of ore in reserve and on the Victoria Claim, newly under development, it is figured that there are a possible 5,000,000 tons.

British Columbia, there is no doubt, is ready to take a more prominent place than heretofore as a copper producer as soon as labor and other costs decline or the price of the metal advances.

#### FORT RUPERT, VANCOUVER ISLAND. WAS FOUNDED AS A COAL DEPOT.

Few people are aware that Russians loaned to the Company their brig "Constantine" and crew to build a fort and established the mines at Fort Rupert. As a better idea of this operation may be had from the opening entry in the Fort Rupert Journal, dated Friday, May 11, 1849, as follows:

At 8 a.m. the H.H.B. Company's steam vessel, having the Russian American Company's brig "Constantine" in tow entered Beaver Harbor, Mr. Chief Factor Work, having with him Mr. Chief Trader MacNeil and clerks Blenkinsop, Beadmore and Simpson also a party of 28 men, being on board the two vessels to establish a fort for the trading of coal and furs. Shortly after anchoring, the above-named gentleman and a few men landed to search for a site which was found towards evening on the southeast side of the harbour rather a rugged spot but conveniently situated for a good supply of water, this article being of paramount importance. The Indians appear friendly and well pleased at our coming to establish amongst them, and have so far done all in their power to assist us, and there is every reason to believe that we shall be free from molestation; one thing, however, is certain, that they are second to none in the art of stealing. We commence to-morrow morning in earnest clearing a place for the Fort with rather a motley set for such an undertaking."

The fort was finished and the Russians sent back. Coal was not at first mined, but brought from the Indians who picked it up from a small exposed seam only 18 inches wide. In a short time there had been delivered according to the amount paid one thousand tons, but when sold and loaded on ships it was found that only about seven hundred tons were on hand. The Indians were living up to their reputation by stealing what they had already sold, then reselling it.

In order to mine in an economical and up-to-date manner necessary machinery was ordered from England, but before its arrival the Company were convinced that Fort Rupert as a coal field was a failure. Quatsino Inlet was examined with the idea of making that a great coaling port for the immense fleet of ships that these far-seeing men knew would soon swarm to the Pacific Ocean.

Before anything further was done, coal was found at Colville town, but now known as Nanaimo.

Robert Dunsmuir was soon an outstanding figure at these mines. So much were his capabilities relied on that a separate agreement was entered into with him in which he received a higher rate of remuneration than the others.

At the commencement of the operations there was an ample market but later, when the output became greater, it was a problem what to do with the stock on hand, and in spite of the numerous British warships requiring coal during the Crimea war the supply on hand reached nine thousand tons. The greatest market, San Francisco, could only pay \$8 per ton, and the freight rate was \$10 per ton so that the outlook did not appear bright.

The London management were not satisfied and sent out a new man, Mr. A. G. Dallas, to take over the full management of their affairs.

A new broom sweeps clean, and this new broom lived strictly up to that reputation. All the old hands were let out, and a Mr. C. S. Nicol, in 1860 was given full charge. He, it was, who was instrumental in forming a company to take over the whole interests of the Hudson's Bay Company, at Nanaimo, which subsequently found its way into the hands of Mr. Robert Dunsmuir. The immense fortune accumulated by him, together with the high place he reached in the affairs of the country generally, are worthy of special note in British Columbia history.—From the "Victoria Times."

#### WASIPIKA CUTS OREBODY AT 200 FT.

Development work at the Wasipika Gold Mine has recently been confined to sinking to the 200 ft. level. This level has now been reached and the orebody broken into by crosscutting. The first round in the quartz exposed good ore. Crosscutting is now being continued.

When sinking the shaft, the orebody was encountered at the 160 ft. level and for forty-four feet below that depth a large part of the drilling was in quartz. The vein dips to the west at about 65° and as the shaft is a vertical one it cuts diagonally through the vein.

Systematic sampling of the quartz in the shaft and crosscut is not yet completed. Preliminary sampling, however, gives assurance that the values are holding well with depth.

The numerous channel samples taken at the Wasipika indicate that the values are almost entirely in the quartz. The adjacent schist nearly always shows some gold when assayed; but the values in it are low. There is unfortunately a large tonnage of quartz in the orebody and the schist can advantageously be discarded.

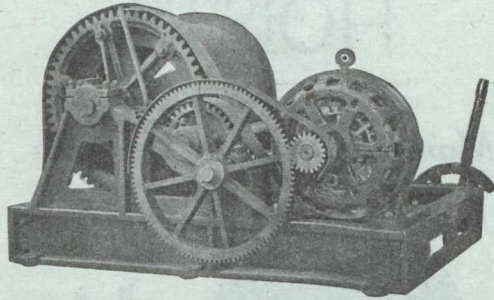
Ore from the 200 ft. level is similar to that at the 100 ft. level; but somewhat higher in pyrites content. It has the same minute black stains as noted in the ore from the 100 ft. crosscut and which may possibly be a silver mineral. It has been noted that high gold



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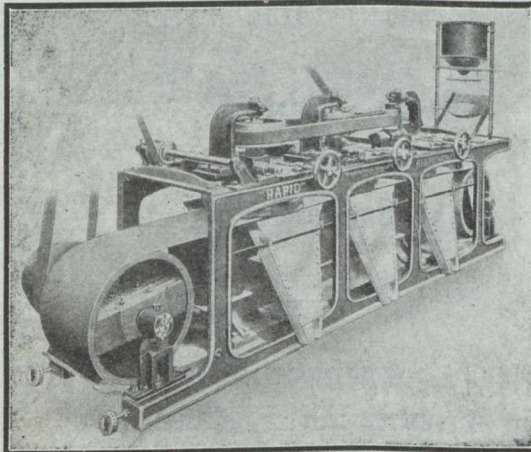
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values are frequently present in quartz showing these small black areas.

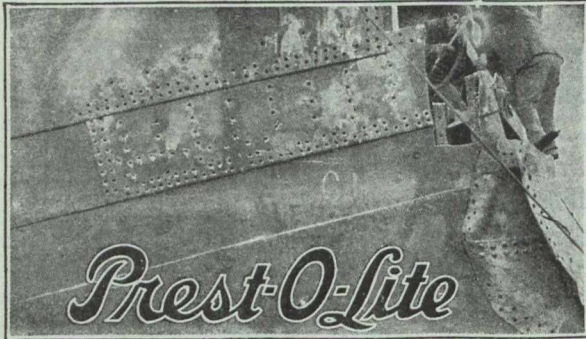
It was noted in the quartz from the 100 ft. cross-cut that the silver values are quite important at the Wasapika. The many surface samples were assayed only for gold and the silver values there are not known. Samples from the 100 and 200 ft. levels that have been assayed for silver as well as gold show important quantities of the former. One sample from the first round in the quartz at the 200 ft. level showed three and a half ounces of silver per ton as well as \$20.18 gold per ton. This would mean about \$3.50 in silver. Another sample from the quartz near the bottom of the shaft showed one half ounce of silver per ton as well as \$7 in gold per ton.

At the 100 ft. level a sample cut across the 40 inch rich shoot at the footwall assayed \$26.84 gold per ton and showed also four ounces silver per ton. Several samples showing about \$12 gold per ton for a width of 5 ft. in the 100 ft. crosscut all show silver present in important quantity. There seems good reason to believe that silver can be counted upon as an important asset in addition to the gold.—R.E.H.

It is reported that Cobalt bloom has been discovered four miles east of the Mandy Mine on Schist Lake, Northern Manitoba. Commissioner Wallace states that a sample submitted to him contained smalite.



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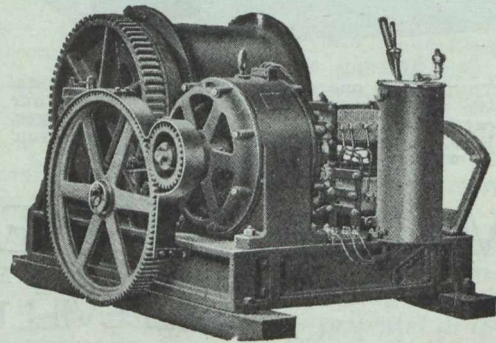
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850	380	1500	Westinghouse Parsons	150	150 lb.
1000	240	1500		1000	
1000	6600		Westinghouse	1000	
2000	2200	750	General Elec. Curtis	2000	150 lb.
2500	2400		Westinghouse	2500	150 lb.
2500	2200	1500	Westinghouse Parsons	2500	150 lb.
2500	2400	1500	Westinghouse	2500	150 lb.
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prospecting gold, tin and other placer deposits,  
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drilling of oil and water wells,  
testing of foundations, etc.

The drills were purchased from the New York Engineering Company, 2 Rector Street, New York City, and among their circulars there are testimonial letters from Mr. F. S. Clarke, British Columbia Drill and Dredging Company, Vancouver, and Mr. G. H. Knowlton, Vancouver.

Full Particulars and Prices on application to the Geological Survey, Department of Mines, at address given above, or to the Secretary, War Purchasing Commission, Ottawa, Ont.

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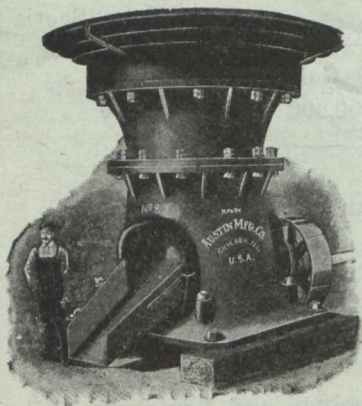
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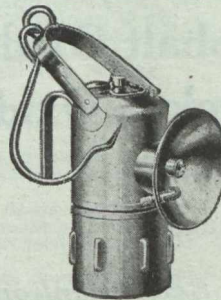
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*It will prove the durability—the steady  
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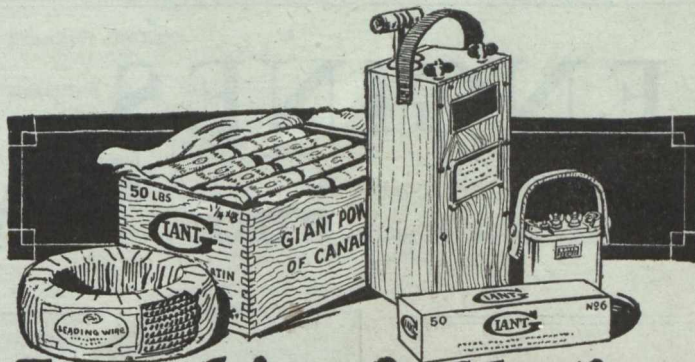
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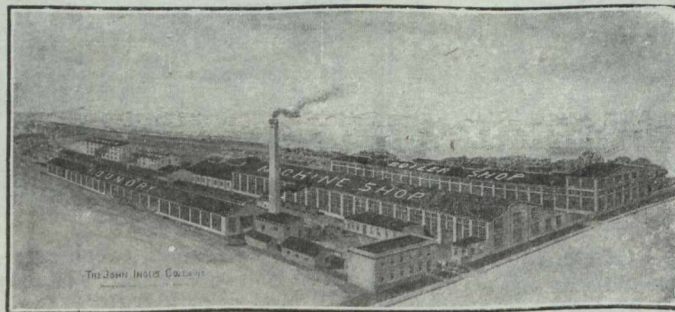
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# The Canadian Miners' Buying Directory.

**Acetylene Gas:**

Canada Carbide Company, Ltd.  
Canadian Fairbanks-Morse.  
Prest-O-Lite Co. of Canada, Ltd.

**A.C. Units:**

MacGovern & Co.

**Agitators:**

The Dorr Co.

**Air Hoists:**

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

**Alloy and Carbon Tool Steel:**

H. A. Drury Co., Ltd.  
International High Speed Steel Co., Rockaway, N.J.

**Alternators:**

MacGovern & Co.

Spielman Agencies, Regd.

**Aluminium:****Amalgamators:**

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

**Antimony:**

Canada Metal Co.

**Antimonial Lead:**

Pennsylvania Smelting Co.

**Arrester, Locomotive Spark:**

Hendrick Manufacturing Co.

**Arsenic White Lead:**

Coniagas Reduction Co.

**Assayers' and Chemists' Supplies:**

Dominion Engineering & Inspection Co.  
Lymans, Limited  
Mine & Smelter Supply Co.  
Pennsylvania Smelting Co.  
Stanley, W. F. & Co., Ltd.

**Ash Conveyors:**

Canadian Link-Belt Company

**Ashes Handling Machinery:**

Canadian Mead-Morrison Co., Limited

**Assayers and Chemists:**

Milton L. Hersey Co., Ltd.  
Campbell & Deyell  
Ledoux & Co.  
Thos. Heys & Son  
C. L. Constant Co.

**Asbestos:**

Everitt & Co.

**Balls:**

Canadian Foundries and Forgings, Ltd.  
Canadian Steel Foundries, Ltd.  
Hull Iron & Steel Foundries, Ltd.  
Fraser & Chalmers of Canada, Ltd.  
The Electric Steel & Metals Co.  
The Wabi Iron Works.  
The Hardinge Conical Mill Co.

**Ball Mills:**

Hardinge Conical Mill Co.  
Hull Iron & Steel Foundries, Ltd.  
Mine and Smelter Supply Co.  
Fraser & Chalmers of Canada, Ltd.  
The Electric Steel & Metals Co.  
The Wabi Iron Works.

**Balances—Heusser:**

Canadian Fairbanks-Morse Co., Ltd.  
Mine and Smelter Supply Co.

**Babbit Metals:**

Canada Metal Co.  
Canadian Fairbanks-Morse Co., Ltd.  
Hoyt Metal Co.

**Ball Mill Feeders:**

Fraser & Chalmers of Canada, Ltd.  
Hardinge Conical Mill Co.  
Hull Iron & Steel Foundries, Ltd.

**Ball Mill Linings:**

Hardinge Conical Mill Co.

Hull Iron & Steel Foundries, Ltd.

**Belting—Leather, Rubber and Cotton:**

Canadian Fairbanks-Morse Co., Ltd.  
Link Belt Co.  
The Mine & Smelter Supply Co.  
Northern Canada Supply Co.  
Jones & Glasco.

**Belting:**

R. T. Gilman & Co.

**Belting—Silent Chain:**

Hans Renold of Canada, Limited, Montreal, Que.

**Belting (Transmission):**

Goodyear Tire & Rubber Co.

**Belting (Elevator):**

Goodyear Tire & Rubber Co.

**Belting (Conveyor):**

Goodyear Tire & Rubber Co.

**Blasting Batteries and Supplies:**

Canadian Ingersoll-Rand Co., Ltd.  
Mussens, Ltd.  
Northern Canada Supply Co.  
Canadian Explosives, Ltd.  
Giant Powder Co. of Canada, Ltd.

**Bluestone:**

The Consolidated Mining & Smelting Co.

**Blowers:**

Canadian Fairbanks-Morse Co., Ltd.  
MacGovern & Co., Inc.  
Northern Canada Supply Co.  
Fraser & Chalmers of Canada, Ltd.

**Boilers:**

Northern Canada Supply Co.  
Canadian Ingersoll-Rand Co., Ltd.  
Marsh Engineering Works  
MacGovern & Co., Inc.  
R. T. Gilman & Co.  
Fraser & Chalmers of Canada, Ltd.  
The John Inglis Company  
Wabi Iron Works.

**Blue Vitriol (Coniagas Eed):**

Canadian Fairbanks-Morse Co., Ltd.

**Bortz and Carbons:**

Diamond Drill Carbon Co.

**Boxes, Cable Junction:**

Standard Underground Cable Co. of Canada, Ltd.  
Northern Electric Co., Ltd.

**Brazilian Rough Diamonds:**

Diamond Drill Carbon Co.

**Brazilian Mica:**

Diamond Drill Carbon Co.

**Buggies, Mine Car (Steel)**

Hendrick Manufacturing Co.

**Brazilian Ballas:**

Diamond Drill Carbon Co.

**Brazilian Rock Crystal:**

Diamond Drill Carbon Co.

**Brazilian Tourmalines:**

Diamond Drill Carbon Co.

**Brazilian Aquamarines:**

Diamond Drill Carbon Co.

**Bridges—Man Trolley and Rope Operated—Material Handling:**

Canadian Mead-Morrison Co., Limited

**Bronze, Manganese, Perforated and Plain:**

Hendrick Manufacturing Co.

**Buckets:**

Canadian Ingersoll-Rand Co., Ltd.  
Canadian Mead-Morrison Co., Limited  
The Electric Steel & Metals Co.  
R. T. Gilman & Co.  
Hendrick Manufacturing Co.  
Link-Belt Co.  
Marsh Engineering Works  
Mussens, Ltd.  
MacKinnon Steel Co., Ltd.  
Northern Canada Supply Co.  
Fraser & Chalmers of Canada, Ltd.  
The Wabi Iron Works

**Buckets, Elevator:**

Hendrick Mfg. Co.

**Cable—Aerial and Underground:**

Northern Canada Supply Co.  
Standard Underground Cable Co. of Canada, Ltd.

**Cableways:**

Canadian Mead-Morrison Co., Limited  
Fraser & Chalmers of Canada, Ltd.  
Mussens, Ltd.  
The Wabi Iron Works  
R. T. Gilman & Co.

**Cages:**

Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.  
Northern Canada Supply Co.  
Fraser & Chalmers of Canada, Ltd.  
The Electric Steel & Metals Co.  
The Mine & Smelter Supply Co.  
Mussens, Ltd.  
The Wabi Iron Works



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METALS & ALLOYS**

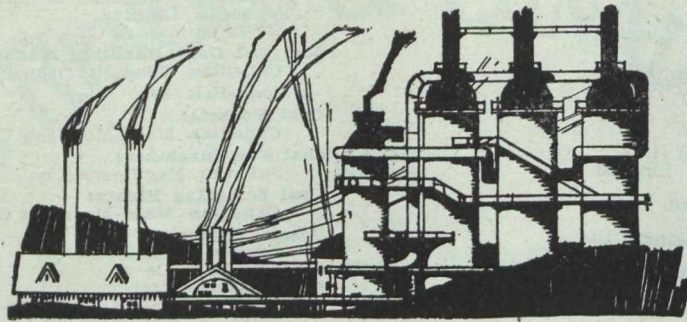
**COBALT, TUNGSTEN, MOLYBDENUM, NICKEL, ALUMINIUM, FERRO - SILICON, FERRO - CHROME, ETC  
ASBESTOS—CRUDE, FIBRES, SHINGLE STOCK.**



## Canadian Miners' Buying Directory.—(Continued)

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

- Cut Gears:**  
Hans Renold of Canada, Limited, Montreal, Que.
- Cyanide:**  
American Cyanamid Company.
- Cyanide Plant Equipment:**  
The Dorr Co.  
The Mine & Smelter Supply Co.
- D. C. Units:**  
MacGovern Co.
- Derricks:**  
Smart-Turner Machine Co.  
Canadian Mead-Morrison Co., Limited.  
Marsh Engineering Works  
R. T. Gilman & Co.  
Canadian Fairbanks-Morse Co., Ltd.  
Mussens, Limited
- Diamond Drill Contractors:**  
Diamond Drill Contracting Co.  
E. J. Longyear Company  
Smith & Travers  
Sullivan Machinery Co.
- Diamond Tools:**  
Diamond Drill Carbon Co.
- Diamond Importers:**  
Diamond Drill Carbon Co.
- Digesters:**  
Canadian Chicago Bridge and Iron Works
- Dies:**  
Canada Foundries & Forgings, Ltd.  
Hull Iron & Steel Foundries, Ltd.
- Dredger Pins:**  
Canadian Steel Foundries, Ltd.  
Hull Iron & Steel Foundries, Ltd.  
The Electric Steel & Metals Co.  
Hadfields, Limited
- Dredging Machinery:**  
Canadian Steel Foundries, Ltd.  
Canadian Mead-Morrison Co., Limited.  
Hadfields, Limited  
Hull Iron & Steel Foundries, Ltd.  
R. T. Gilman & Co.
- Dredging Ropes:**  
Allan, Whyte & Co.  
Greening, B., Wire Co., Ltd.  
R. T. Gilman & Co.
- Drills, Air and Hammer:**  
Canadian Ingersoll-Rand Co., Ltd.  
Canadian Rock Drill Co.  
Denver Rock Drill Mfg. Co., Ltd.  
Sullivan Machinery Co.  
Northern Canada Supply Co.  
Osborn, Sam'l (Canada) Limited.  
The Mine & Smelter Supply Co.  
Mussens, Limited
- Drills—Core:**  
Canadian Ingersoll-Rand Co., Ltd.  
E. J. Longyear Company  
Standard Diamond Drill Co.  
Sullivan Machinery Co.
- Drills—Diamond:**  
Sullivan Machinery Co.  
Northern Canada Supply Co.  
E. J. Longyear Company
- Drill Steel—Mining:**  
H. A. Drury Co., Ltd.  
Hadfields, Limited  
International High Speed Steel Co., Rockaway.  
Osborn, Sam'l (Canada) Limited.  
Mussens, Limited  
Swedish Steel & Importing Co., Ltd.
- Drill Steel Sharpeners:**  
Canadian Ingersoll-Rand Co., Ltd.  
Canadian Rock Drill Co.  
Denver Rock Drill Mfg. Co., Ltd.  
Northern Canada Supply Co.  
Sullivan Machinery Co.  
Osborn, Sam'l (Canada) Limited.  
The Wabi Iron Works
- Drills—Electric:**  
Canadian Fairbanks-Morse Co., Ltd.  
Sullivan Machinery Co.  
Northern Electric Co., Ltd.
- Drills—High Speed and Carbon:**  
Canadian Fairbanks-Morse Co., Ltd.  
Osborn, Sam'l (Canada) Limited.  
H. A. Drury Co., Ltd.  
Hadfields, Limited
- Dynamite:**  
Canadian Explosives  
Giant Powder Company of Canada, Ltd.  
Northern Canada Supply Co.
- Dynamos:**  
Canadian Fairbanks-Morse Co., Ltd.  
MacGovern & Company
- Ejectors:**  
Canadian Fairbanks-Morse Co., Ltd.  
Canadian Ingersoll-Rand Co., Ltd.  
Northern Canada Supply Co.
- Elevators:**  
Canadian Mead-Morrison Co., Limited.  
Sullivan Machinery Co.  
Northern Canada Supply Co.  
Hadfields, Limited  
Fraser & Chalmers of Canada, Ltd.  
Mussens, Limited  
The Wabi Iron Works
- Engineering Instruments:**  
C. L. Berger & Sons
- Engines—Automatic:**  
Canadian Fairbanks-Morse Co., Ltd.  
Canadian Mead-Morrison Co., Limited.  
Fraser & Chalmers of Canada, Ltd.
- Engines—Gas and Gasoline:**  
Canadian Fairbanks-Morse Co., Ltd.  
Alex. Fleck  
Fraser & Chalmers of Canada, Ltd.  
Osborn, Sam'l (Canada) Limited.  
Sullivan Machinery Co.  
Gould, Shapley & Muir Co., Ltd.  
MacGovern & Co., Inc.  
The Mine & Smelter Supply Co.
- Engines—Haulage:**  
Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.  
Canadian Mead-Morrison Co., Limited.  
Marsh Engineering Works  
Fraser & Chalmers of Canada, Ltd.
- Engines—Marine:**  
Canadian Fairbanks-Morse Co., Ltd.  
MacGovern & Co., Inc.  
Swedish Steel & Importing Co., Ltd.
- Engines—Steam:**  
Canadian Fairbanks-Morse Co., Ltd.  
Canadian Mead-Morrison Co., Limited.  
R. T. Gilman & Co.  
MacGovern & Co., Inc.  
Fraser & Chalmers of Canada, Ltd.
- Engines—Stationary:**  
Swedish Steel & Importing Co., Ltd.
- Engineers:**  
General Engineering Co., New York  
The Dorr Co.
- Ferro-Alloys (all Classes):**  
Everitt & Co.
- Feed Water Heaters:**  
MacGovern & Co.
- Fire Fighting Supplies:**  
Gutta Percha & Rubber, Ltd.
- Flashlights—Electric:**  
Spielman Agencies, Regd.
- Flood Lamps:**  
Northern Electric Co., Ltd.
- Flourspar:**  
The Consolidated Mining & Smelting Co.  
Everitt & Co.
- Forges:**  
Canadian Fairbanks-Morse Co., Ltd.  
Northern Canada Supply Co.
- Forging:**  
Canadian Mead-Morrison Co., Limited.  
Canadian Foundries and Forgings, Ltd.  
Hull Iron & Steel Foundries, Ltd.  
Smart-Turner Machine Co.  
Hadfields, Limited  
Fraser & Chalmers of Canada, Ltd.
- Frogs:**  
Canadian Steel Foundries, Ltd.  
Hull Iron & Steel Foundries, Ltd.  
John J. Gartshore
- Frequency Changers:**  
MacGovern & Co., Inc.
- Furnaces—Assay:**  
Canadian Fairbanks-Morse Co., Ltd.  
Lymans, Limited  
Mine & Smelter Supply Co.
- Fuse:**  
Canadian Explosives  
Giant Powder Company of Canada, Ltd.  
Northern Canada Supply Co.
- Gaskets:**  
Gutta Percha & Rubber, Ltd.
- Gears:**  
Hans Renold of Canada, Limited, Montreal, Que.
- 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.  
Gutta Percha & Rubber, Ltd.
- Hose (Fire):**  
Goodyear Tire & Rubber Co.  
Gutta Percha & Rubber, Ltd.
- Hose (Packings)**  
Goodyear Tire & Rubber Co.  
Gutta Percha & Rubber, Ltd.
- Hose (Suction):**  
Goodyear Tire & Rubber Co.  
Gutta Percha & Rubber, Ltd.
- Hose (Steam):**  
Goodyear Tire & Rubber Co.  
Gutta Percha & Rubber, Ltd.
- Hose (Water):**  
Goodyear Tire & Rubber Co.  
Gutta Percha & Rubber, Ltd.
- Hammer Rock Drills:**  
Canadian Rock Drill Co.  
Denver Rock Drill Mfg. Co., Ltd.  
Osborn, Sam'l (Canada) Limited.  
Mussens, Limited  
The Mine & Smelter Supply Co.
- Hangers and Cable:**  
Standard Underground Cable Co. of Canada, Ltd.
- High Speed Steel:**  
Canadian Fairbanks-Morse Co. Ltd.  
H. A. Drury Co., Ltd.  
Osborn, Sam'l (Canada) Limited.  
Hadfields, Limited  
International High Speed Steel Co., Rockaway, N.J.
- High Speed Steel Twist Drills:**  
Canadian Fairbanks-Morse Co., Ltd.  
H. A. Drury Co., Ltd.  
Northern Canada Supply Co.  
Osborn, Sam'l (Canada) Limited.
- Hoists—Air, Electric and Steam:**  
Canadian Ingersoll-Rand Co., Ltd.  
Canadian Fairbanks-Morse Co., Ltd.  
Canadian Rock Drill Co.  
Denver Rock Drill Mfg. Co., Ltd.  
Jones & Glassco  
Canadian Mead-Morrison Co., Limited.  
Marsh Engineering Works  
Northern Canada Supply Co.  
Mine & Smelter Supply Co.  
Fraser & Chalmers of Canada, Ltd.  
The Electric Steel & Metals Co.  
The Wabi Iron Works  
R. T. Gilman & Co.  
Mussens, Limited  
Link-Belt Co.
- Hoisting Engines:**  
Canadian Fairbanks-Morse Co., Ltd.  
Canadian Rock Drill Co.  
Denver Rock Drill Mfg. Co., Ltd.  
The Electric Steel & Metals Co.  
Mussens, Limited  
Sullivan Machinery Co.  
Canadian Ingersoll-Rand Co., Ltd.  
Canadian Mead-Morrison Co., Limited.  
Marsh Engineering Works  
Fraser & Chalmers of Canada, Ltd.  
The Mine & Smelter Supply Co.
- Hoisting Towers:**  
Canadian Mead-Morrison Co., Limited.
- Hose:**  
Canadian Fairbanks-Morse Co., Ltd.  
Gutta Percha & Rubber, Ltd.  
Northern Canada Supply Co.
- Hydraulic Machinery:**  
Canadian Fairbanks-Morse Co., Ltd.  
Hadfields, Limited  
MacGovern & Co., Inc.  
Fraser & Chalmers of Canada, Ltd.  
The Wabi Iron Works
- Industrial Chemists:**  
Hersey, M. & Co., Ltd.
- Ingot Copper:**  
Canada Metal Co., Ltd.  
Hoyt Metal Co.
- Insulating Compounds:**  
Standard Underground Cable Co. of Canada, Ltd.
- Inspection and Testing:**  
Dominion Engineering & Inspection Co.
- Inspectors:**  
Hersey, M. & Co., Ltd.
- Jacks:**  
Canadian Fairbanks-Morse Co., Ltd.  
Can. Brakeshoe Co., Ltd.  
Northern Canada Supply Co.  
R. T. Gilman & Co.  
Mussens, Limited
- Jack Screws:**  
Canadian Foundries and Forgings, Ltd.
- Laboratory Machinery:**  
Mine & Smelter Supply Co.
- Lamps—Acetylene:**  
Dewar Manufacturing Co., Inc.
- Lamps—Carbide:**  
Dewar Manufacturing Co., Inc.
- Lamps—Miners:**  
Canada Carbide Company, Limited  
Canadian Fairbanks-Morse Co., Ltd.  
Dewar Manufacturing Co., Inc.  
Northern Electric Co., Ltd.  
Mussens, Limited
- Lamps:**  
Dewar Manufacturing Co., Inc.
- Lanterns—Electric:**  
Spielman Agencies, Regd.
- Lead (Pig):**  
The Canada Metal Co., Ltd.  
Consolidated Mining & Smelting Co.
- Levels:**  
C. L. Berger & Sons
- Locomotives (Steam, Compressed Air and Storage Steam):**  
Canadian Fairbanks-Morse Co., Ltd.  
H. K. Porter Company  
R. T. Gilman & Co.  
Fraser & Chalmers of Canada, Ltd.  
Mussens, Limited
- Link Belt**  
Canadian Fairbanks-Morse Co. Ltd.  
Northern Canada Supply Co.  
Jones & 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  
Osborn, Sam'l (Canada) Limited.  
Hull Iron & Steel Foundries, Ltd.  
Fraser & Chalmers of Canada, Ltd.  
The Wabi Iron Works
- Metal Marking Machinery:**  
Canadian Fairbanks-Morse Co., Ltd.
- Metal Merchants:**  
Henry Bath & Son  
Geo. G. Blackwell, Sons & Co.  
Coniagas Reduction Co.  
Consolidated Mining & Smelting Co. of Canada  
Canada Metal Co.  
C. L. Constant Co.  
Everitt & Co.
- Metallurgical Engineers:**  
General Engineering Co., New York  
The Durr Co.
- Metallurgical Machinery:**  
General Engineering Co., New York  
The Durr Co.  
The Mine & Smelter Supply Co.
- Metal Work, Heavy Plates:**  
Canada Chicago Bridge & Iron Works
- Mica:**  
Everitt & Co.  
Diamond Drill Carbon Co.
- Mining Engineers:**  
Hersey, M. Co., Ltd.
- Mining Drill Steel:**  
H. A. Drury Co., Ltd.  
Osborn, Sam'l (Canada) Limited.  
International High Speed Steel Co., Rockaway, N.J.
- Mining Requisites:**  
Canadian Steel Foundries, Ltd.  
Dominion Wire Rope Co., Ltd.  
Hadfields, Limited  
Osborn, Sam'l (Canada) Limited.  
Hull Iron & Steel Foundries, Ltd.  
Fraser & Chalmers of Canada, Ltd.  
The Electric Steel & Metals Co.  
The Wabi Iron Works
- Mining Ropes:**  
Dominion Wire Rope Co., Ltd.
- Mine Surveying Instruments:**  
C. L. Berger & Sons
- Molybdenite:**  
Everitt & Co.
- Monel Metal (Wire, Rod, Sheet and Foundry Metal):**  
International Nickel Co.
- Motors:**  
Canadian Fairbanks-Morse Co., Ltd.  
R. T. Gilman & Co.  
MacGovern & Co.  
The Mine & Smelter Supply Co.  
The Wabi Iron Works



## Canadian Miners' Buying Directory.—(Continued)

- Motor Generator Sets—A.C. and D.C.**  
MacGovern & Co.
- Nails:**  
Canada Metal Co.
- Nickel:**  
International Nickel Co.  
Coniagas Reduction Co.  
The Mond Nickel Co., Ltd.
- Nickel Anodes:**  
The Mond Nickel Co., Ltd.
- Nickel Salts:**  
The Mond Nickel Co., Ltd.
- Nickel Sheets:**  
The International Nickel Co. of Canada  
The Mond Nickel Co., Ltd.
- Nickel Wire:**  
The Mond Nickel Co., Ltd.  
The International Nickel Co. of Canada
- Oil Analysts:**  
Constant, C. L. Co.
- Ore Handling Equipment:**  
Canadian Mead-Morrison Co., Limited.
- Ore Sacks:**  
Northern Canada Supply Co.
- Ore Testing Works:**  
Ledoux & Co.  
Can. Laboratories  
Milton Hersey Co.  
Campbell & Deyell  
General Engineering Co., New York  
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.  
Gutta Percha & Rubber, Ltd.
- Paints—Special:**  
Spielman Agencies, Regd.
- Perforated Metals:**  
Northern Canada Supply Co.  
Hendrick Mfg. Co.  
Canada Wire and Iron Goods Company.  
Greening, B., Wire Co.
- Permissible Explosives:**  
Giant Powder Company of Canada, Ltd.
- Pig Tin:**  
Canada Metal Co., Ltd.  
Hoyt Metal Co.
- Pig Lead:**  
Canada Metal Co., Ltd.  
Hoyt Metal Co.  
Pennsylvania Manufacturing Co.
- Pillow Blocks:**  
Canadian Link-Belt Company
- 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 & Glasco  
R. T. Gilman & Co.
- Powder:**  
Giant Powder Company of Canada, Ltd.
- 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, L.  
The Wabi Iron Works
- Pumps—Pneumatic:**  
Canadian Fairbanks-Morse Co., Ltd.  
Smart-Turner Machine Co.  
Sullivan Machinery Co.
- Pumps—Steam:**  
Canadian Fairbanks-Morse Co., Ltd.  
Canadian Ingersoll-Rand Co., Ltd.  
The Electric Steel & Metals Co.  
The Mine & Smelter Supply Co.  
Mussens, Limited  
Northern Canada Supply Co.  
Smart-Turner Machine Co.  
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.  
Canadian Mead-Morrison Co., Limited.  
Canadian Ingersoll-Rand Co., Ltd.  
Mine & Smelter Supply Co.  
Fraser & Chalmers of Canada, Ltd.  
The Wabi Iron Works
- Pumps—Diaphragm**  
The Dorr Company
- Pumps—Electric**  
Canadian Fairbanks-Morse Co., Ltd.  
Fraser & Chalmers of Canada, Ltd.  
Mussens, Limited  
Smart-Turner Machine Co.
- Pumps—Sand and Slime:**  
Canadian Fairbanks-Morse Co., Ltd.  
Fraser & Chalmers of Canada, Ltd.  
Mine & Smelter Supply Co.  
The Electric Steel & Metals Co.  
The Wabi Iron Works  
Smart-Turner Machine Co.
- Quarrying Machinery:**  
Canadian Rock Drill Co.  
Denver Rock Drill Mfg. Co., Ltd.  
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.
- Roller Chain:**  
Hans Renold of Canada, Limited, Montreal, Que.
- Roofing:**  
Canadian Fairbanks-Morse Co., Ltd.  
Northern Canada Supply Co.
- Rope—Manilla:**  
Osborn, Sam'l (Canada) Limited.  
Mussens, Limited
- Rope—Manilla and Jute:**  
Jones & Glasco  
Northern Canada Supply Co.  
Osborn, Sam'l (Canada) Limited.  
Allan, Whyte & Co.



## Canadian Miners' Buying Directory.—(Continued)

**Rope—Wire:**

Allan, Whyte & Co.  
 Dominion Wire Rope Co., Ltd.  
 Greening, B. Wire Co.  
 Northern Canada Supply Co.  
 Mussels, Limited

**Rolls—Crushing**

Canadian Steel Foundries, Ltd.  
 Fraser & Chalmers of Canada, Ltd.  
 Hull Iron & Steel Foundries, Ltd.  
 Osborn, Sam'l (Canada) Limited.  
 Hadfields, Limited  
 The Electric Steel & Metals Co.  
 Mussels, 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.  
 Mussels, Limited

**Scales—(all kinds):**

Canadian Fairbanks-Morse Co., Ltd.

**Screens:**

Greening, B. Wire Co.  
 Hendrick Mfg. Co.  
 Mine & Smelter Supply Co.  
 Canada Wire and Iron Goods Company.  
 Link-Belt Co.

**Screens—Cross Patent Flanged Lip:**

Hendrick Mfg. Co.

**Screens—Perforated Metal:**

Hendrick Mfg. Co.

**Screens—Shaking:**

Hendrick Mfg. Co.

**Screens—Revolving:**

Hendrick Mfg. Co.

**Scheelite:**

Everitt & Co.

**Separators:**

Canadian Fairbanks-Morse Co., Ltd.  
 Smart-Turner Machine Co.  
 Mine & Smelter Supply Co.

**Shaft Contractors:**

Hendrick Mfg. Co.

**Sheet Metal Work:**

Hendrick Mfg. Co.

**Sheets—Genuine Manganese Bronze:**

Hendrick Mfg. Co.

**Shoes and Dies:**

Canadian Foundries and Forgings, Ltd.  
 H. A. Drury Co., Ltd.  
 Fraser & Chalmers of Canada, Ltd.  
 Hull Iron & Steel Foundries, Ltd.  
 The Electric Steel & Metals Co.  
 The Wabi Iron Works

**Shovels—Steam:**

Canadian Foundries and Forgings, Ltd.  
 Canadian Mead-Morrison Co., Limited.  
 Osborn, Sam'l (Canada) Limited.  
 R. T. Gilman & Co.

**Ship Bunkering Equipment:**

Canadian Mead-Morrison Co., Limited.

**Silent Chain:**

Hans Renold of Canada, Limited, Montreal, Que.

**Silene:**

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:**

Hans Renold of Canada, Limited, Montreal, Que.  
 Link-Belt Co.

**Spring Coil and Clips Electric:**

Canadian Steel Foundries, Ltd.

**Steel Barrels:**

Smart-Turner Machine Co.  
 Fraser & Chalmers of Canada, Ltd.

**Stamp Forgings:**

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

**Steel Castings:**

Canadian Brakeshoe Co., Ltd.  
 Canadian Steel Foundries, Ltd.  
 Fraser & Chalmers of Canada, Ltd.  
 Osborn, Sam'l (Canada) Limited.  
 Hull Iron & Steel Foundries, Ltd.  
 The Electric Steel & Metals Co.  
 Hadfields, Limited  
 The Wabi Iron Works

**Steel Drills:**

Canadian Fairbanks-Morse Co., Ltd.  
 Canadian Rock Drill Co.  
 Denver Rock Drill Mfg. Co., Ltd.  
 Sullivan Machinery Co.  
 Northern Canada Supply Co.  
 The Electric Steel & Metals Co.  
 Osborn, Sam'l (Canada) Limited.  
 Canadian Ingersoll-Rand Co., Ltd.  
 Mussels, Limited  
 Swedish Steel & Importing Co., Ltd.

**Steel Drums:**

Smart-Turner Machine Co.

**Steel—Tool:**

Canadian Fairbanks-Morse Co., Ltd.  
 H. A. Drury Co., Ltd.  
 N. S. Steel & Coal Co.  
 Osborn, Sam'l (Canada) Limited.  
 Hadfields, Limited  
 Swedish Steel & Importing Co., Ltd.

**Structural Steel Work (Light):**

Hendrick Mfg. Co.

**Stone Breakers:**

Hadfields, Limited  
 Fraser & Chalmers of Canada, Ltd.  
 The Electric Steel & Metals Co.  
 Osborn, Sam'l (Canada) Limited.  
 Mussels, 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.  
 Mussels, Limited.

**Switches and Turntables:**

John J. Gartshore

**Tables—Concentrating:**

Mine & Smelter Supply Co.  
 Fraser & Chalmers of Canada, Ltd.  
 The Electric Steel & Metals Co.

**Tanks:**

R. T. Gilman & Co.

**Tanks—Acid:**

Canadian Chicago Bridge & Iron Works  
 The Mine & Smelter Supply Co.

**Tanks (Wooden):**

Canadian Fairbanks-Morse Co., Ltd.  
 Gould, Shapley & Muir Co., Ltd.  
 Pacific Coast Pipe Co., Ltd.  
 Mine & Smelter Supply Co.  
 The Wabi Iron Works

**Tanks—Cyanide, Etc.:**

Hendrick Mfg. Co.  
 Pacific Coast Pipe Co.  
 MacKinnon Steel Co.  
 Fraser & Chalmers of Canada, Ltd.  
 Mine & Smelter Supply Co.  
 The Wabi Iron Works

**Tanks—Steel:**

Canadian Fairbanks-Morse Co., Ltd.  
 Canadian Ingersoll-Rand Co., Ltd.  
 Canadian Chicago Bridge & Iron Works  
 Marsh Engineering Works  
 Osborn, Sam'l (Canada) Limited.  
 MacKinnon Steel Co.  
 Fraser & Chalmers of Canada, Ltd.  
 The Electric Steel & Metals Co.  
 Hendrick Mfg. Co.  
 The Wabi Iron Works

**Tanks—Oil Storage:**

Canadian Chicago Bridge & Iron Works  
 The Mine & Smelter Supply Co.

**Tanks (water) and Steel Towers:**

Canadian Fairbanks-Morse Co., Ltd.  
 Canadian Chicago Bridge & Iron Works  
 Gould, Shapley & Muir Co., Ltd.  
 MacKinnon Steel Co.  
 Mine & Smelter Supply Co.  
 The Wabi Iron Works

**Tires—Auto, Truck and Bicycle:**

Gutta Percha & Rubber, Ltd.



## 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 Apparatus:**  
Jones & Glasco

**Transmission Machinery:**  
Hans Renold of Canada, Limited, Montreal, Que.

**Troughs (Conveyer):**  
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.

**Twineemes:**  
Canada Foundries & Forgings, Ltd.

**Uranium:**  
Everitt & Co.

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

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

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

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

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

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

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

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

**Wire Rope Fittings:**  
Canada Wire and Iron Goods Company.

**Wire Cloth:**  
Northern Canada Supply Co.  
Greening, B. Wire Co.  
Canada Wire & Iron Goods Company

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

**Wolfram Ore:**  
Everitt & Co.

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

**Zincium:**  
Everitt & Co.

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

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

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**Aero Brand Cyanide** deliveries are practically free from dependance upon outside raw materials. **Common Salt** is the only thing that is bought in the open market. The other materials are produced in large quantities right in the same plant where Aero Brand Cyanide is made.

Regular operation at pre-determined costs makes possible the quoting of a uniformly low price, together with dependable deliveries.

The efficiency of Aero Brand Cyanide has been proved in the use of thousands of tons in Mexico, Canada and the United States, for the reduction of gold and silver ores, and for chemical purposes.

*Send for Booklet "C," giving details  
about this interesting product.*

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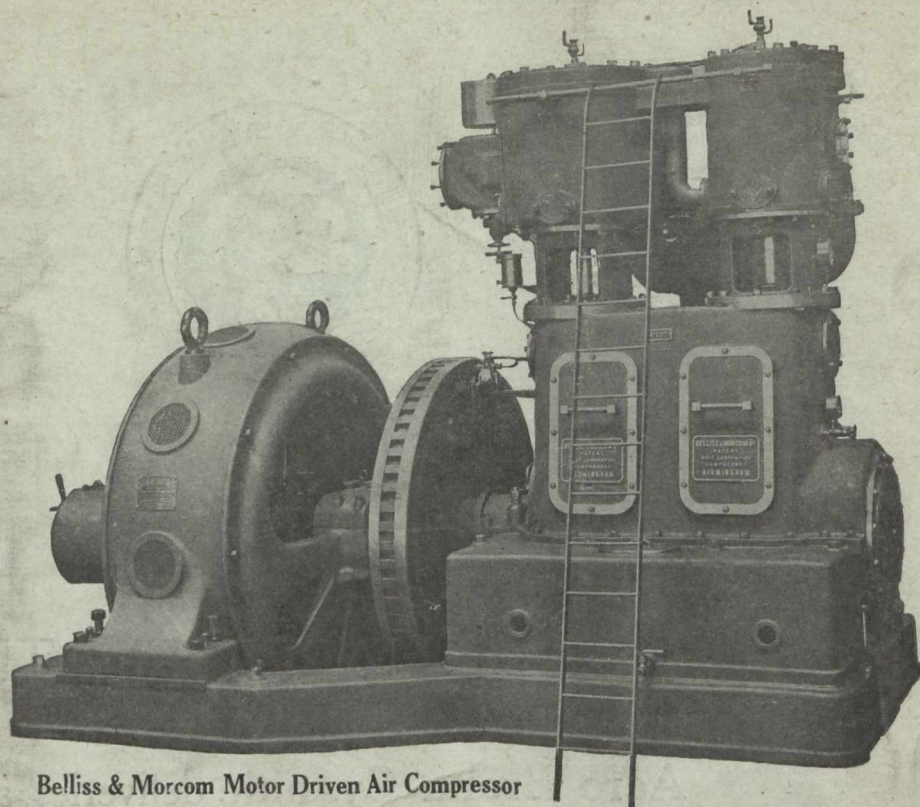


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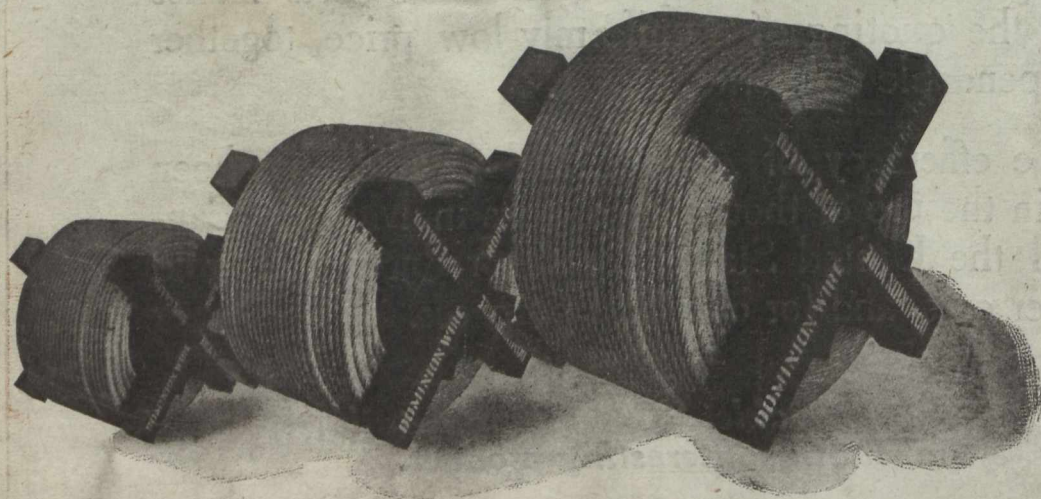
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