

# CANADIAN MINING JOURNAL

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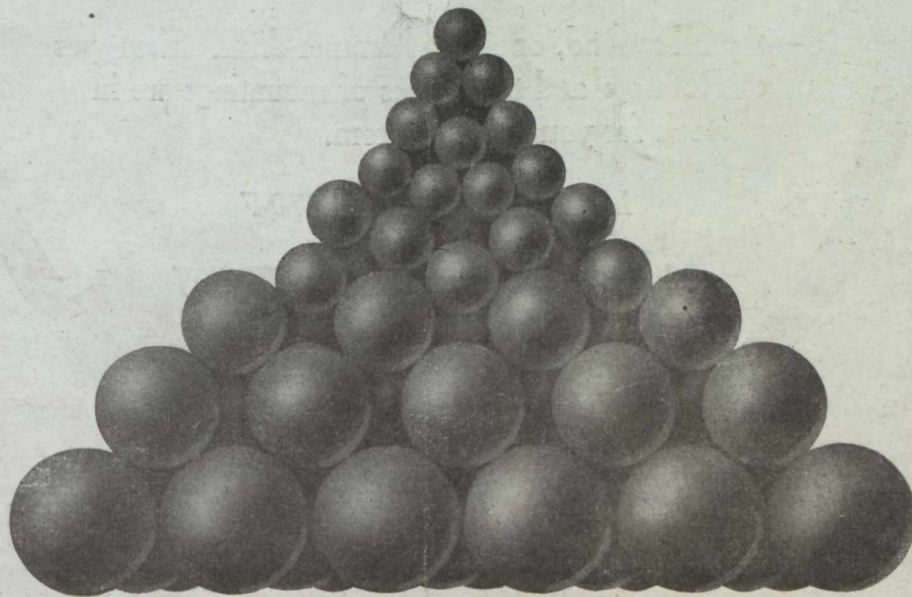
No. 38

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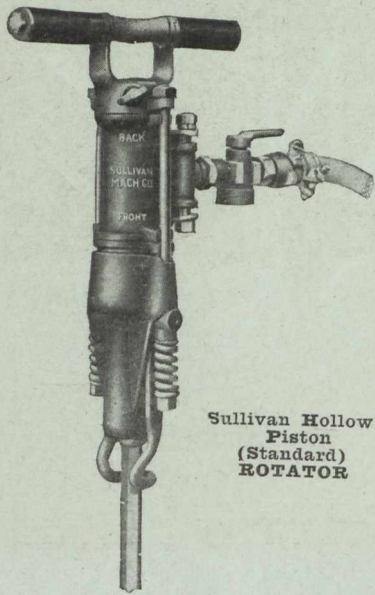
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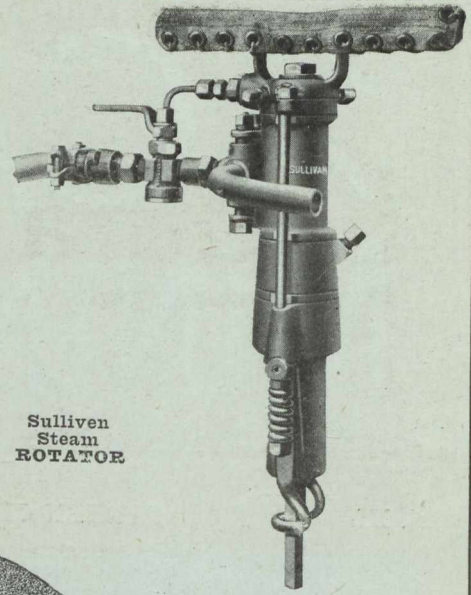
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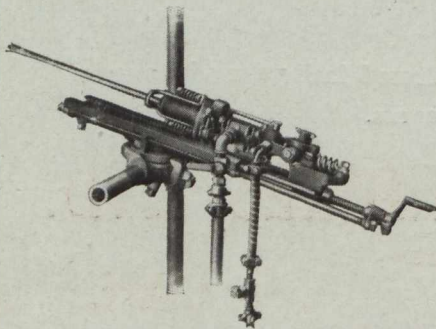
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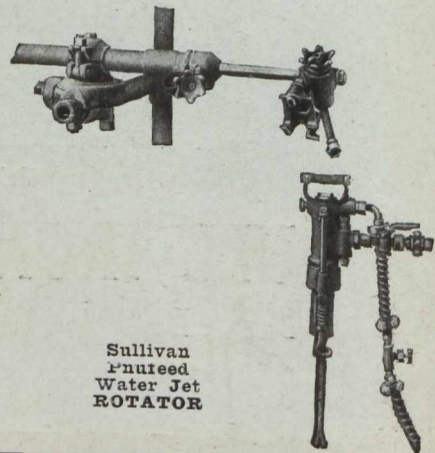
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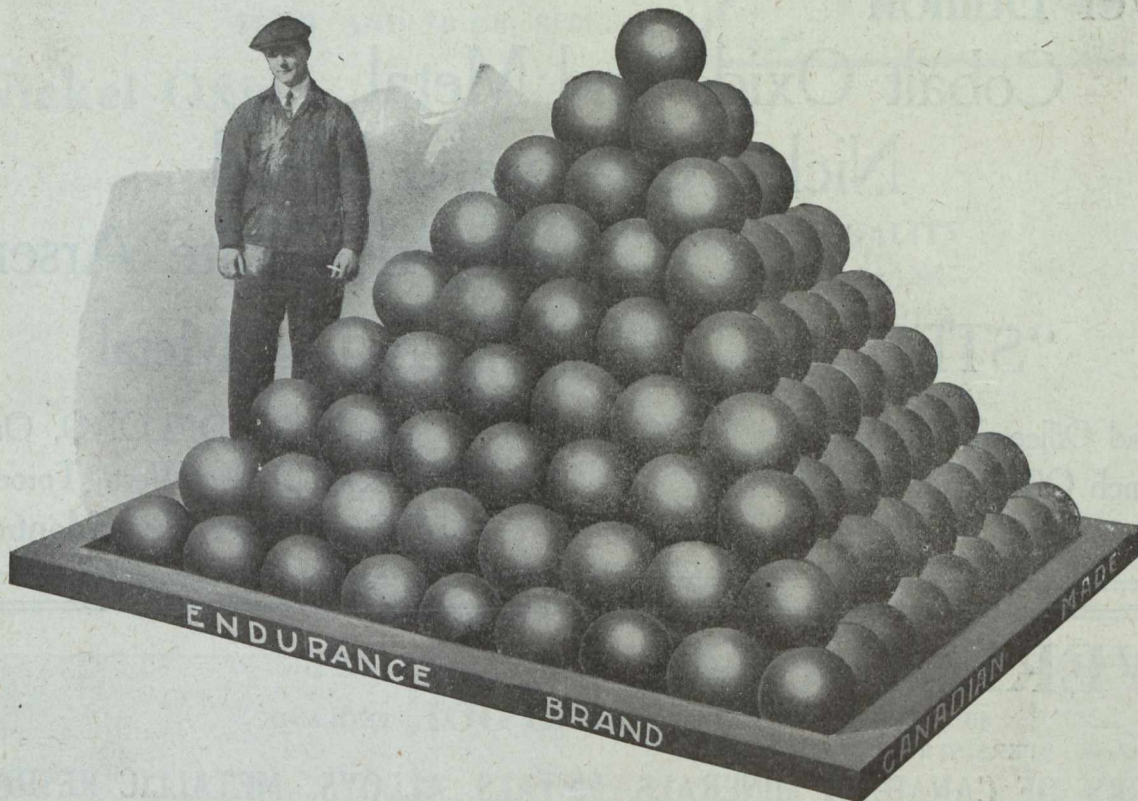


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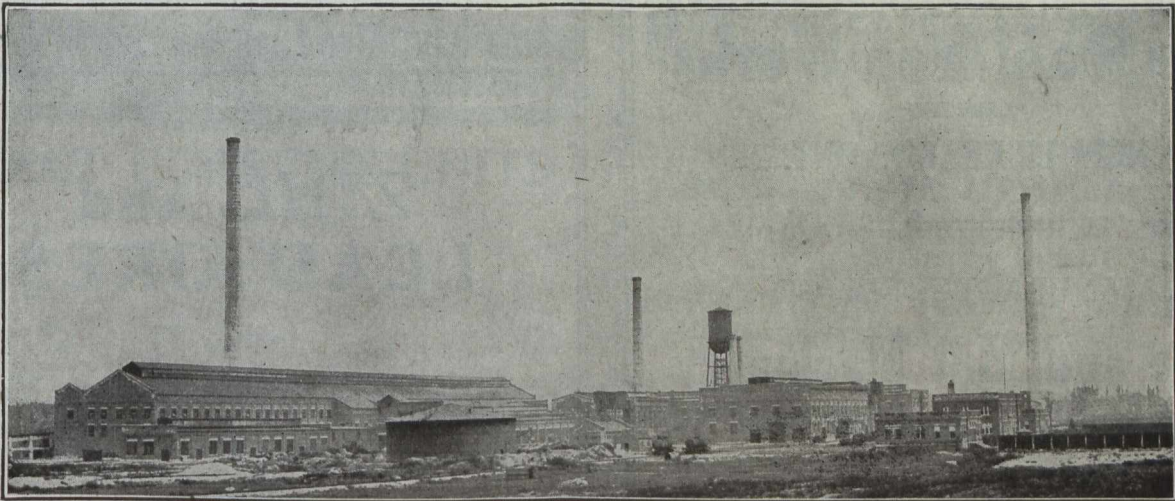
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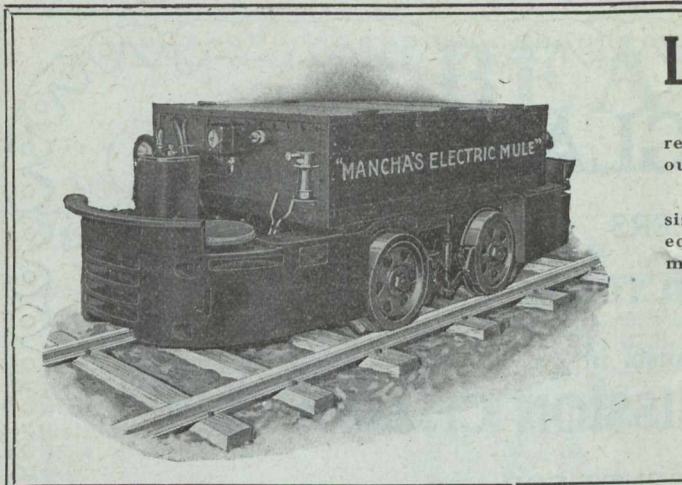
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| 7          | Gen. Elec.         | 550            | 5 x 4½ in.           | Gen. Elec.         |       |
| 7½         | Fairbanks Morse    | 350            | 8 x 10 in.           | Fairbanks Morse    |       |
| 10         | "                  | 525            | 5½ x 5 in.           | "                  |       |
| 15         | Western Elec.      | 800            | 2 x 2 in.            | Fuller             |       |
| 25         | United Elec.       | 325            | 8 x 10 in.           | Robb Armstrong     |       |
| 30         | Westinghouse       | 350            | 9 x 15 x 9 in.       | Westinghouse       |       |
| 50         | Bullock            | 275            | 12 x 12 in.          | Payne              |       |
| 50         | Gen. Elec.         | 275            | 13 x 12 in.          | Armington Sims     |       |
| 62½        | Westinghouse       |                |                      | Robb Armstrong     |       |
| 75         | Westinghouse       | 750            | 125 h.p.             | Phoenix            |       |
| 150        | Crocker Wheeler    | 225            | 18 x 17 in.          | Harrisburg Fleming |       |
| 200        | Can. Western Elec. |                | 16 x 24 x 24 in.     | Robb               |       |
|            |                    | 220/250 Volts: |                      |                    |       |
| 60         | Thompson Ryan      | 275            | 13 x 12 in.          | McEwen             |       |
| 62½        | Westinghouse       | 275            | 9 x 16 x 12 in.      | Ide                |       |
| 75         | A. C. B.           | 275            | 11-18 x 11 in.       | Shepherd           |       |
| 75         | Crocker Wheeler    | 275            |                      | Fleming Harrisburg |       |
| 75         | Bullock            | 275            | 13 x 14 in.          | Robb Armstrong     |       |
| 130        | Crocker Wheeler    | 225            | 16 in.               | Buffalo, Twin cyl. |       |
| 150        | Can. Gen. Elec.    | 230            | 17 x 16 in.          | Leonard            |       |
| 150        | Fort Wayne         | 165            | 16 x 24 in.          | Diesel             |       |
| 150        | Bullock            | 160            | 16 x 24 in.          | Bates              |       |
| 500        | Fort Wayne         | 90             | 22-38 x 48 in.       | Allis Chalmers     |       |
| 850        | Westinghouse       | 80/90          | 26½ x 44¼ in.        |                    |       |
|            |                    | 500/550 Volts: |                      |                    |       |
| 300        | Thomson Ryan       | 150            | 24 x 22 in.          | McEwen             |       |
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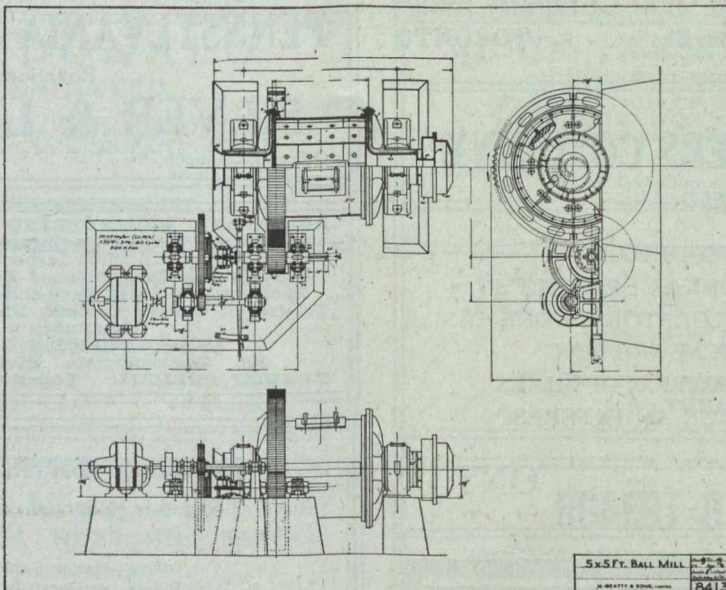
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Ontario in 1918 produced 45 per cent. of the total mineral output of Canada. Returns made to the Ontario Bureau of Mines show the output of the mines and metallurgical works of the Province for the year 1918 to be worth \$80,308,972 of which the metallic production was \$66,178,059.

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

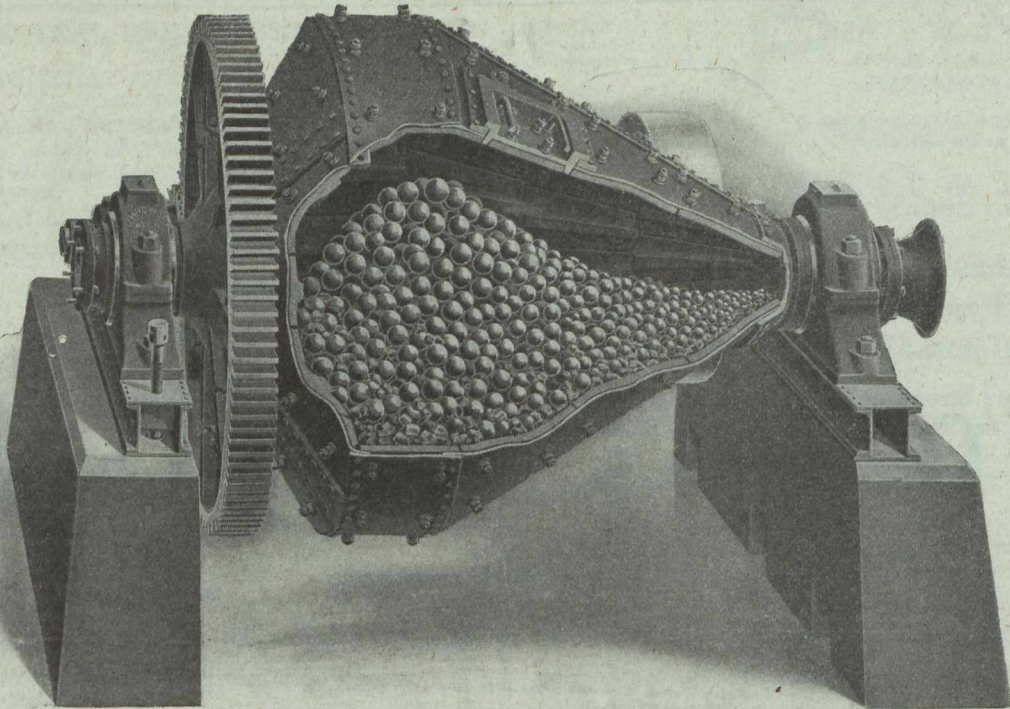
The prospector can go almost anywhere in the mineral regions in his canoe; the climate is invigorating and healthy, and there is plenty of wood and good water. Hydro-electric power is available in many parts of the Province, and many undeveloped water-powers remain to be harnessed. A miner's license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

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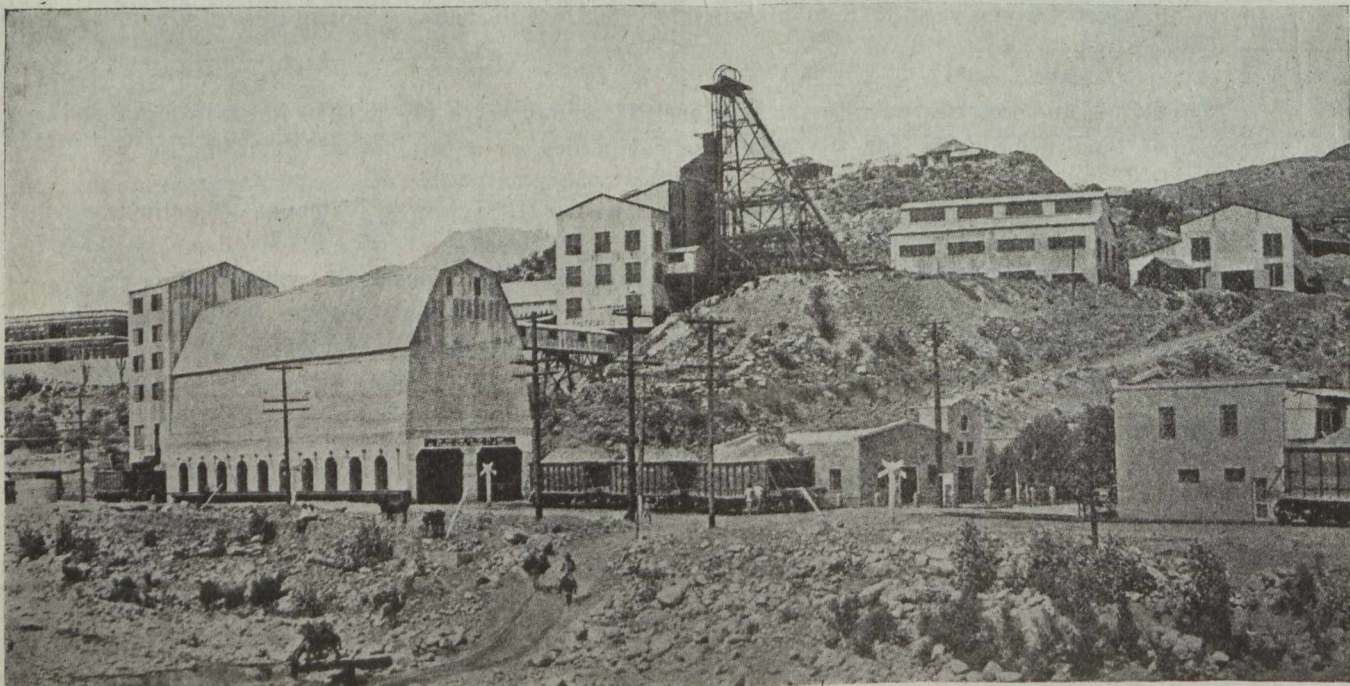
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# Canadian Mining Journal

A Weekly Journal devoted to the Science and Practice of the Mining, Metallurgical and Allied Industries, with an Up-to-date Review of existing conditions.

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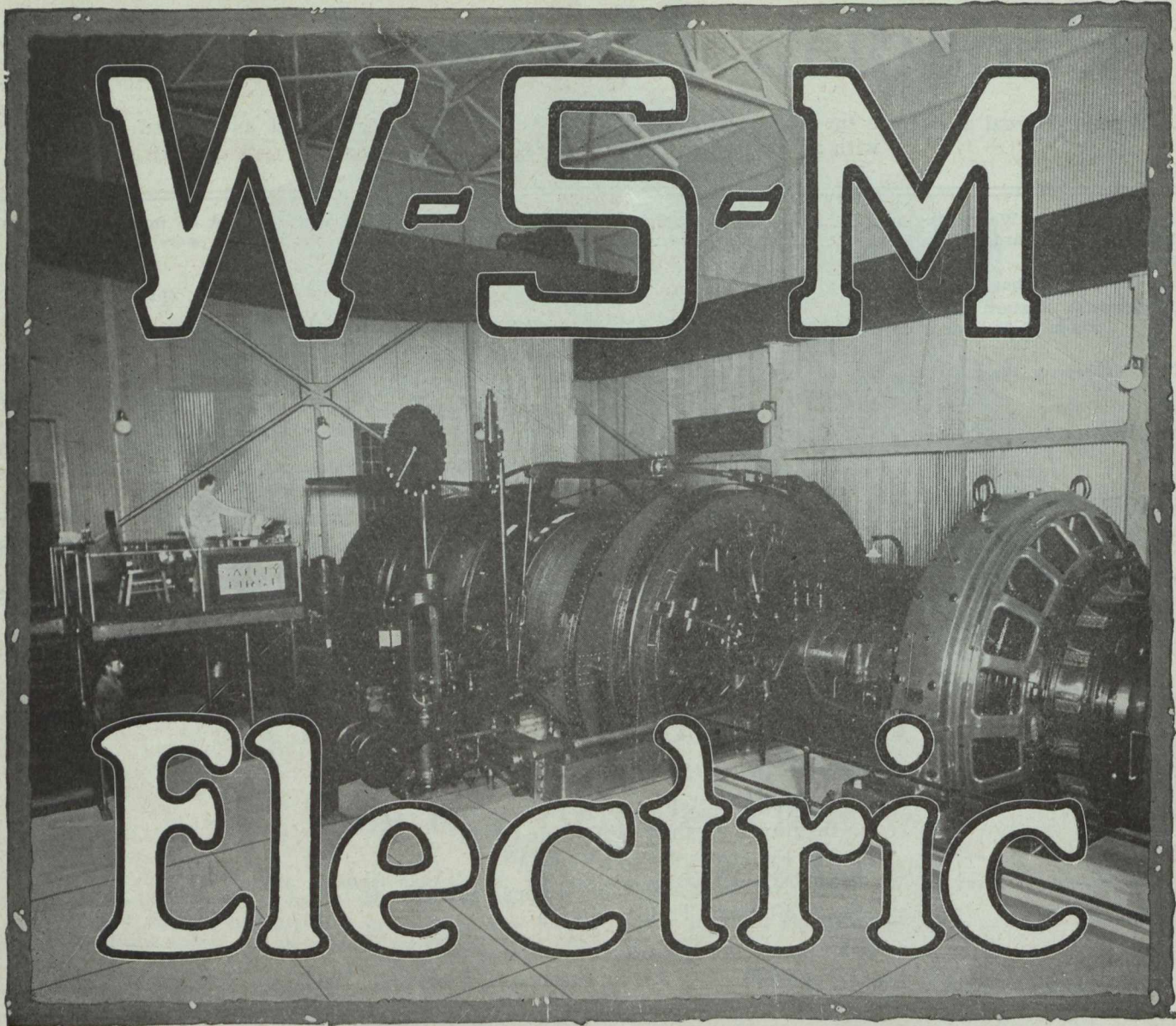
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# EDITORIAL

## A REAL MINISTER OF MINES.

This issue of the 'Journal' contains two photographs taken at the camp of the Big Missouri Mine, Salmon River, B. C. This promising silver property is owned by Sir Donald Mann and associates, and is now being developed extensively by diamond drilling. It will be noticed that snow is still lying on the ground although the pictures were taken in mid-Summer.

The photographs are of unusual interest inasmuch as they show the Hon. Wm. Sloan, Minister of Mines of British Columbia, dressed in the insignia and performing the proper duties of his office. British Columbia is evidently fortunate in having a minister who "ministers". The real significance of this word has become obscured, and in many instances the "minister" has conceived himself to be not the servant of his office, but the "boss" of all and sundry. We have no doubt that the mountain air and the exhilarating prospects that an inspection of British Columbian mining camps and prospects affords will benefit a Minister of Mines greatly, even if he hails from so salubrious a seat of government as Victoria, B. C., and that actual inspection of mines, combined with the personal acquaintance of the men who work them, will give any minister of Mines that intimate and sympathetic knowledge that is requisite for the proper discharge of his ministerial duties.

## INSURANCE AGAINST MINE INUNDATION.

In a brief article in this issue of the "Journal" Mr. F. A. McLean calls attention to the insurance value of "pumps on hand."

The necessity for an adequate reserve of pumping capacity is particularly present in submarine mining, where the ability to control an outbreak of water may depend on whether it is found possible to check the flow in the first stages and before the inrush of water has so enlarged the original point of entrance as to make subsequent endeavours to check the flow of no avail.

In one well-known instance in Nova Scotia, where water entered from the sea, it transpired that the pump at the top of the slope, which limited the discharge by its own inadequate capacity, was the smallest of a relay of pumps extending to the bottom of the slope. The pump at the bottom of the slope was furnished with about six feet of "lodgment," and was of course quickly drowned out, and the water which came in was so little controlled by the pumping equipment available, that it was always remained uncertain whether the inbreak was uncontrollable or not. If it

should prove from subsequent trial that the inbreak in question was a controllable one, it may be said with exact truth that the mine referred to was lost because of the lack of a reasonable reserve of pumping capacity, and because of the neglect to provide "lodgment" or water storage capacity sufficient to give the management time to erect dams. The whole of the assets of this mine were lost through the inundation. The invention of the centrifugal pump, combined with electrical drive, makes it possible to provide enormous pumping capacity that can be quickly transferred to the place where it is required, and the provision of such an equipment should be regarded as a necessary insurance against a contingency, which in submarine mining, is always possible.

## THE FUNCTIONS OF THE GEOLOGIST.

The service of geologists employed by the federal and provincial governments are at the present time much in demand.

Large sums of money have been expended on the geological mapping of the still largely unknown mineral-bearing rocks of Canada, and, considering the meagreness of the appropriations available for this purpose, and the pitifully inadequate salaries that the resources of the geological surveys afford to geologists, it must be conceded that the work accomplished has kept reasonably in the lead of the mining development of the mineral areas of Canada.

It may even be that the mining incorporations of Canada have come to depend too largely upon the assistance of the government geologists, and there seems to be an idea abroad that those men should jump from place to place according as importance may appear to attack, first to this place and then to that place, because of mineral discoveries.

Herein lies a certain amount of misconception as to the function of the geologists, and there is some danger of dissipating the energies of a body of scientific workers whose numbers are inadequate for the task before them.

The work of the geologist is above all a process of research, and it is a first requirement for successful research that it shall proceed slowly, being guided from discovery by the steady accumulation of ascertained facts.

A thorough absorption of the geological data appertaining to a given field is only possible by long acquaintance and uninterrupted investigation of that field, and it may take a very long time to absorb suffi-

cient information to enable a conscientious worker to commence constructive theorizing and justify him in announcing conclusions.

We distinguish here between the search for geological data and its recording, and the higher function of geological research.

Unfortunately the financial reward of the geological research worker is too often meagre, and always belated, a necessary consequence of the slow—but not necessarily leisurely—nature of research in any branch of human endeavour.

But, conversely, the reward of research is of infinite possibilities, and has been instanced in our times by very material gains.

Large consolidations of capital, controlling extensive mineral areas, because of the self-perpetuating nature of the legal incorporation, are in many respects possessed of greater stability and are less open to change than the departments of popular systems of government. Popular governments are not of necessity either democratic or of long continuance.

It is not surprising to know that some of the larger mining incorporations have realized the responsibilities that long tenure of title occasions, and have seen the advantages of continuous geological research concentrated on their properties, and have, for these reasons, added a competent geologist to their permanent staff. Such an official can in the case of large companies be offered a larger salary and more untrammelled opportunities for constructive study than is possible in universities and government positions.

From the operating standpoint the employment of a geologist by mining companies is advisable on many considerations, particularly to advise in regard to development work. To drive an expensive tunnel on the strength of a "hunch" is not a lucrative proceeding, but it has often been done, and there is still a large percentage of those who direct mine development who have not realised that mining is a science and not a gamble.

The indications which guide a geologist to his conclusions as to the places where mineral will be found, seem often to the uninitiated to have but the remotest connection with the object of his search, and indeed their connection may be most indirect. Nevertheless, if the geologist is left to his own direction—always presuming his competence—he will in due time far more than justify his appointment.

Many a shaft has been sunk in barren territory, and many a drift driven to no purpose that could have been saved had a geologist been asked for advice. But the reward that follows the casual employment of a consulting geologist is meagre compared to the advantages that would follow the life-long concentration of a competent geologist upon a selected property.

The rewards of research are always proportionate to the extent and concentration of effort, and while even occasional consultation with a geologist may

yield gold fruit, it is a proceeding that does not allow him to demonstrate the true function of his profession or to realise the full extent of the insight derived from his science.

We believe the readers of the "Canadian Mining Journal" will be interested in Mr. J. C. Murray's review of an old book upon Cornwall, reprinted in this issue from the "Mining & Scientific Press." As the Editor of "M. & S. P." writes:

"Mr. Murray, formerly Editor of the "Canadian Mining Journal" is a writer well-known on both sides of the frontier that has no guns or fortifications."

The common heritage of the English-speaking peoples is evidenced by the fact that an ancient treatise dealing with Cornwall should be regarded of sufficient interest to United States' readers to be included in the columns of so discerning a periodical as that edited by Mr. Rickard, than whom no technical writer has done more to cement the bonds which a common origin, a common language, and identical ideals have occasioned between the two nations that live, one north and the other south, of the unfortified frontier to which Mr. Rickard felicitously refers.

Mr. Richard's further comment on Mr. Murray's article will find an echo on this side of the line. He writes:

"In the antique phrasing and quaint spelling of Richard Carew's volume the reader will find many examples of archaic English, and he will recognize some of the terms used by the Cousins Jacks, who have played so useful a part in the development, for example, of the Lake Superior copper mines, of the gold mines of Gilpin county in Colorado, and of Nevada county in California. The gold that "they kept in quills" recalls the use of 'pure quill' to express richness of ore; we are reminded also of the fact that the pioneers from Georgia who first prospected Cherry Creek, near Denver, in 1849, put the gold they found into quills made from the feathers of wild geese. The Cornish cherished the fallacy, as old as mining, that veins and lodes increase in size and richness the deeper they are followed. They did it out of a meagre experience; our modern promoter does it in the face of a vast array of contrary testimony. The reader will find many delightful touches in the quotations given by Mr. Murray and will join us in thanking him for this pleasant diversion from the beaten ways."

#### THE NORTHERN MANITOBA MINERAL AREA NEEDS RAILWAY TRANSPORTATION.

The Manitoba Government has announced that if the Federal Government will not extend the railway from Le Pas the seventy miles necessary to reach the district north of Le Pas which is now showing so much promise of yielding valuable minerals, that the

Province of Manitoba would itself do this. This is real good talking, and Manitoba would have excellent precedent in the construction of the Temiskaming and Northern Ontario Railway by the Province of Ontario. True this railway was not originally designed to open up the Cobalt and Porcupine fields, but incidentally it did this.

The reports from Northern Manitoba are of a most encouraging character, and it is interesting to read in our British Columbia correspondence that recently a shipment of 1,923 tons of copper ore was delivered at Trail, B. C. from the Mandy Mine, near Schist Lake, Northern Manitoba. This ore is handled forty miles by team from the mine, then shipped 125 miles by boat and barge to Le Pas, and from there sent by rail to the Trail Smelter, being handled six or seven times in transit.

The presence of valuable minerals in the new district is now beyond question, and by the courtesy of Dr. Wallace, the Commissioner for Northern Manitoba, the "Journal" has on a number of occasions been able to give first-hand information on these occurrences.

If Manitoba desires to realize the full benefit of the Province's fairly recent acquisition of this northern country the construction of a railway would appear to be the first thing to undertake, and it may well be that enterprise of such a commendable character may be as richly rewarded as was Ontario's enterprise under like circumstances.

If the construction of an ordinary railway is not possible, why not look into the suggestion recently made in the "Journal" that a light railway—such as was used in France—should be built?

#### **RICH COPPER ORE REPORTED FROM GREAT SLAVE DISTRICT.**

It is reported from Edmonton that Major P. Bansall, M.C. of Ottawa, has recently returned from a prospecting trip to the Great Slave Lake district, where he has staked a copper claim, the ore of which assays 49.2 per cent copper, 2 ounces of silver, and a trace of nickel per ton. The claim is located twelve miles inland from navigation on the lake.

During the past four years the district had been carefully prospected by George Bruce, who, unfortunately, fell a victim to the "flu" at the Calgary Barracks last autumn, within a very few days after his return. He had brought samples of ore with him, and rough notes as to location. He was unable to make a detailed report before his death, and Major Bansall undertook to trace Mr. Bruce's course in this Northern area. The Major was fortunate in meeting with an Indian who had accompanied Mr. Bruce, and thus experienced little difficulty in locating the copper prospect.

This work from the beginning has been carried on by a small Edmonton syndicate, who are very optimistic about the mineral possibilities of the country lying to the north of Lake Athabasca, the general formation being the same as that of Porcupine, Cobalt, and Le Pas.

#### **CANADIAN ENGINEERING STANDARDS ASSOCIATION.**

At a meeting of the Main Committee of the Canadian Engineering Standard Association, held on September 8th, Mr. H. H. Vaughan in the Chair, the following new members were appointed:

Mr. J. M. R. Fairbairn, nominated by the Canadian Pacific Railway.

Mr. H. H. Kelley, nominated by the Grand Trunk Railway.

Mr. A. F. Stewart, nominated by the Canadian National Railways.

Mr. F. A. Gaby, nominated by the Hydro-Electric Commission of Ontario.

Mr. A. A. Dion, nominated by the Canadian Electrical Association, and

Mr. J. Stadler, nominated by the Canadian Pulp & Paper Association.

The lists of members for the following Sectional Committees were approved:

Electrical Sectional Committee:

Chairman: Dr. L. A. Herdt.

Sectional Committee on Steel Bridges and Construction

Chairman: Mr. G. H. Duggan.

Sectional Committee on Wire Rope:

Chairman: Professor H. M. Mackay.

Recommendations as to membership of the following Sub-Committees were received and the Committees approved accordingly:

Sub-Committee on Steel Railway Bridges:

Chairman: Mr. P. B. Motley.

Sub-Committee of Incandescent Lamps:

Chairman: Mr. John Murphy.

Sub-Committee of Transformers:

Chairman: Mr. A. A. Dion.

The secretary reported the progress made with regard to various questions already under consideration, and further reported a number of requests for action on the part of the Association. Several of these were approved for further enquiry and report.

The Chairman then welcomed Mr. C. Le Maistre, the secretary of the British Engineering Standards Association, who is now on a visit to Canada and the United States. Mr. Le Maistre described briefly the work of the B.E.S.A. and drew the attention of the Committee to certain matters in which his Association would welcome the assistance and co-operation of the Canadian Engineering Standards Association, referring especially to proposals which have been made with a view of obtaining some degree of Anglo-American agreement as to screw thread standards. Mr. Le Maistre further pointed out the desirability of international agreement as to rules affecting electric appliances and fittings, particularly for interior use.

As regards the first suggestion, it was decided to appoint a Sub-Committee on Screw Threads, with instructions to consider and report on Mr. Le Maistre's communication.

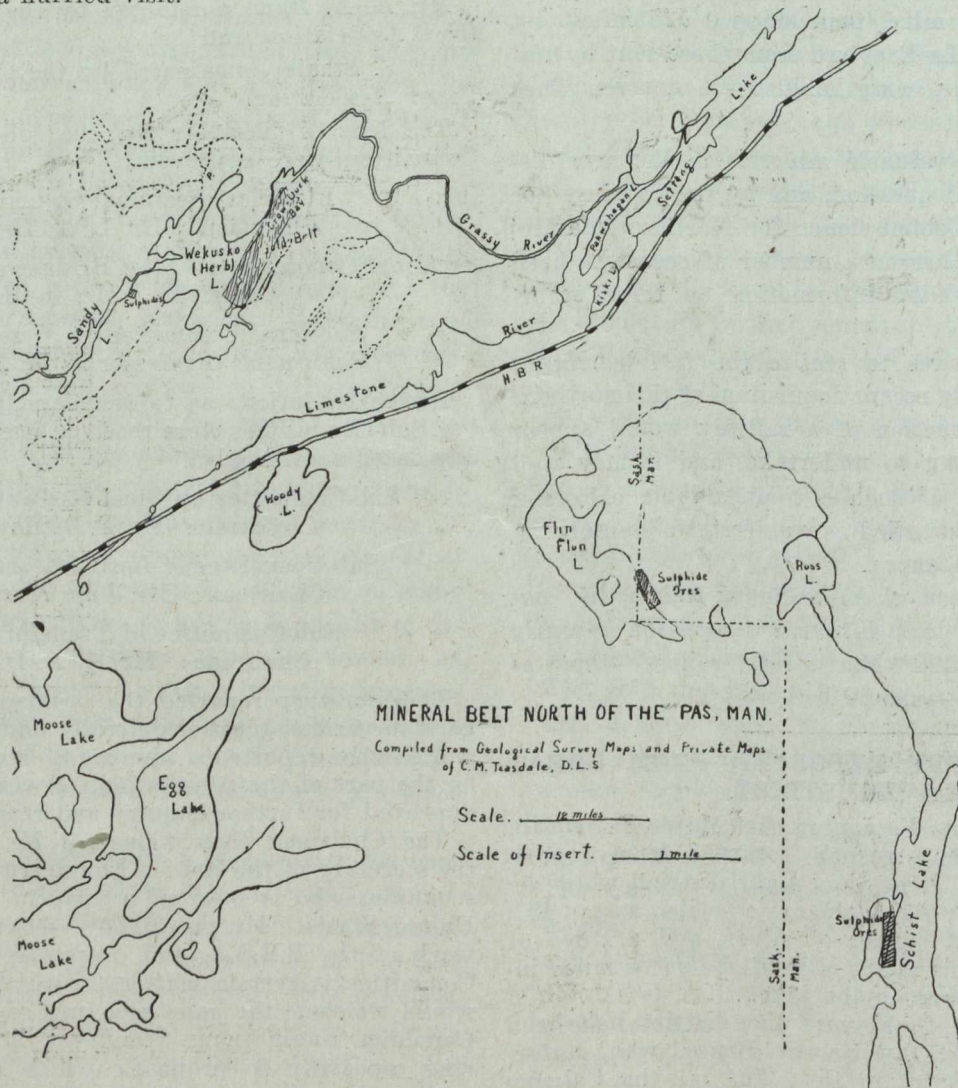
Considerable discussion took place on the question of rules for electric appliances and the Committee agreed that the formulation of a Canadian Electric Code was most desirable. The Committee then directed that a Sub-Committee should be called together to enquire and report further as to this point.

# Recent Developments in Manitoba

By Justin S. De Lury.\*

The discovery of wonderfully rich gold ore in the vicinity of Copper Lake in Northern Manitoba by J. P. Gordon and his associates has aroused country-wide interest and has made that area the Mecca of prospectors and mining men during the past few weeks. The writer was fortunate in having a day or two to spend in the Copper Lake area and as few facts have been published in connection with the several discoveries in that vicinity, he believes that readers of the Journal may be interested in reading a few notes accumulated in a hurried visit.

feet, having an average width of quartz in this length of about a foot and a half and of sheared rock and quartz of three or four feet. On an adjoining claim to the southwest is a vein which might be a continuation of the other vein, from which it is separated by overburdened rock. This vein is traceable for several hundred feet with an average width of about three feet of quartz. The quartz in these veins, or vein, if they are connected, shows the following sulphides in varying though usually small amount: pyrite, molybdenite,



## Rich Ore At Copper Lake.

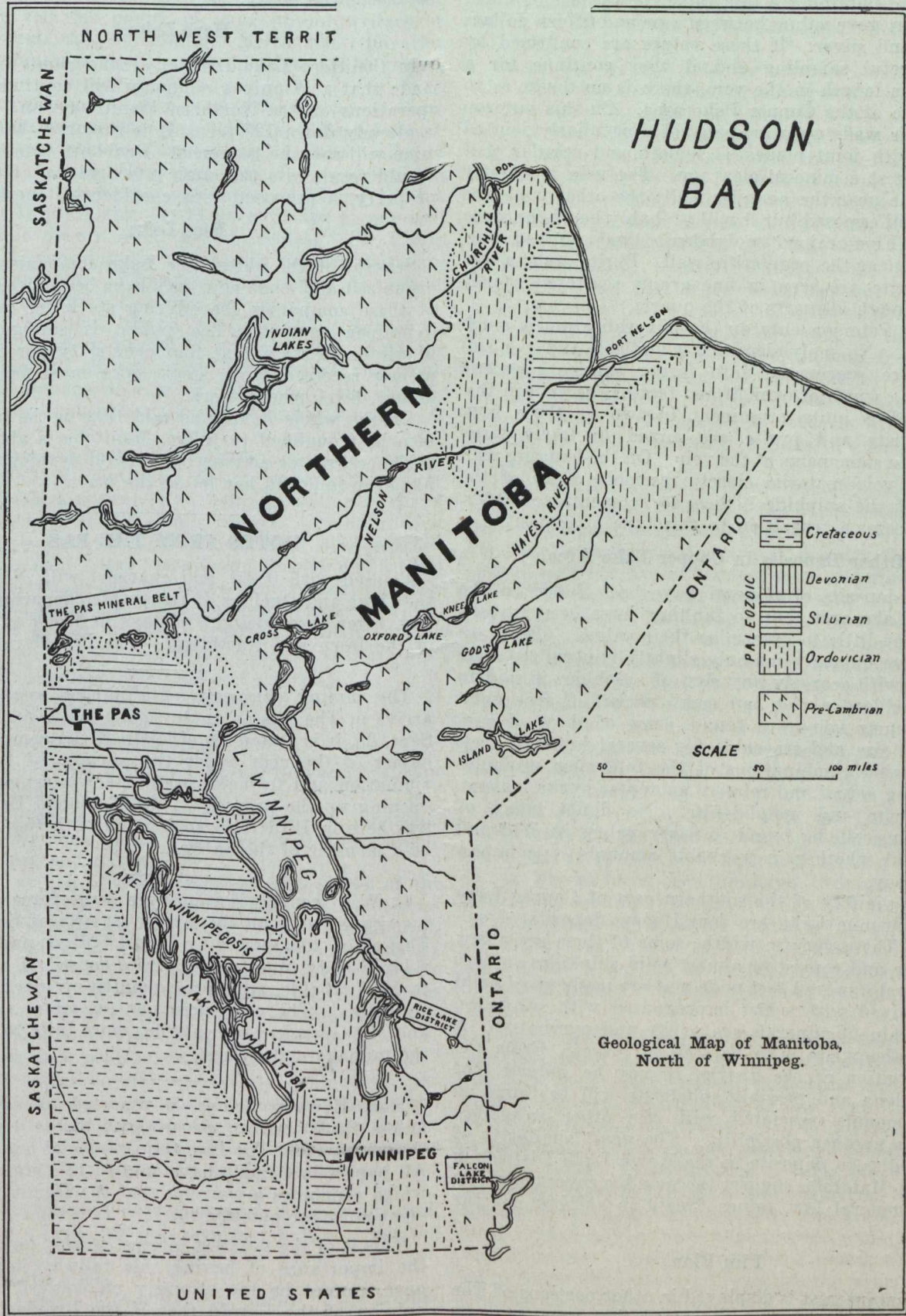
The discovery that was given widest publicity by the press of the country was that of a very rich pocket of native gold in quartz occurring in a quartz vein near the shore of Copper Lake on a claim held by J. P. Gordon. Gold to the reported value of several thousand dollars was taken from this pocket which outcropped on the surface. At the time of the writer's visit some rich ore was still to be seen at the bottom of a small pit from which the high-grade had been removed. Running each way from the pocket, the quartz vein is exposed for a length of about four hundred

feet, having an average width of quartz in this length of about a foot and a half and of sheared rock and quartz of three or four feet. On an adjoining claim to the southwest is a vein which might be a continuation of the other vein, from which it is separated by overburdened rock. This vein is traceable for several hundred feet with an average width of about three feet of quartz. The quartz in these veins, or vein, if they are connected, shows the following sulphides in varying though usually small amount: pyrite, molybdenite,

## Large Deposits on Gordon and Peterson Properties.

What appears to be a more important discovery is a large quartz vein which outcrops on claims held by J. P. Gordon and associates and on others held by Carl Peterson. This vein lies to the north of the previously described vein. It strikes northeast and is nearly vertical with a steep dip to the northwest. The average width as judged from the best outcrops appears to be at least twenty feet. The length as determined from the strikes and outcrops will doubtless be two thousand feet and may be about two miles. The writer

\* Department of Geology, University of Manitoba.



Geological Map of Manitoba,  
North of Winnipeg.

has no first-hand knowledge of the values contained in this vein, but he has information which is regarded as reliable that on the principal outcrop on one of Gordon's claims, six samples, taken by picking pieces with the idea of obtaining a fair value for the whole width of the vein, gave values between nine and fifteen dollars in gold and silver. If these values are confirmed by more careful sampling and if they continue for a reasonable length in the vein, there is no doubt as to the future of the Copper Lake area. On this outcrop the vein is made up principally of a peculiarly jointed quartz, with joint planes so smooth and regular that they suggest a mineral cleavage. The vein is slightly pegmatitic near the hanging wall; the other wall was not so well exposed but it will probably be of the same nature. Fine-grained molybdenite was noticed particularly near the pegmatitic wall. Pyrite, galena and chalcopyrite are seen in fine grains scattered apparently through all parts of the quartz.

On the Peterson outcrop the mineralization is much the same. No molybdenite was noticed and the sulphides are segregated into larger masses. Galena shows in a width of over fifteen feet of the vein in this place and is quite prominent in two or three feet. Chalcopyrite and pyrite are mixed in fairly large bunches in some parts of the vein. On the hanging wall here the vein material closely resembles some of the phases of the sulphide bodies, to be mentioned later, and indicates a transition to this type of deposit.

#### Other Deposits in Copper Lake Area.

Other deposits of mineral have been found in the Copper Lake area, but so far they have been investigated very little to determine their values. There are some large quartz veins only slightly mineralized; one of these with scarcely any sign of sulphides is said to have produced a rich but small pocket of free gold. Other quartz veins are found, some of them of considerable size and traceable for several hundred feet, and showing combinations of the following sulphides in varying actual and relative amounts: pyrite, galena, chalcopyrite and molybdenite. No doubt many of these veins will be found to carry values in gold and silver, but whether in workable amounts it is impossible to say.

In the vicinity of the southern part of Copper Lake and of Brunne Lake are found some deposits of sulphides. These vary in width; some of them are a few feet wide and consist of almost solid sulphides; others are several hundred feet wide and are made up of solid bands mixed with schist impregnated with sulphides. The prominent minerals are pyrite and pyrrhotite. A little chalcopyrite is to be seen in places. From the mineralization of the district it may be judged that some galena and possibly sphalerite will be found in small amount associated with the other sulphides. Nickel is another possibility. The great similarity of these bodies to deposits in the Hawk Lake District in southern Manitoba suggest the possible presence of tin and in general low values except in sulphur for the bodies.

#### Flin Flon.

Unusual interest is displayed in other portions of The Pas Mineral Belt. It is expected that arrangements will soon be concluded whereby work in the way of railroad building and smelter erecting will be initiated with a view to developing the Flin Flon sulphide ore bodies. If this work goes ahead, no doubt the Tona-

pah Mining Company will continue production from the Mandy Mine; at the present time this company is shipping the high-grade copper ore taken from the mine last year, by means of barges working on the Saskatchewan River.

#### Herb Lake.

In the Herb Lake District arrangements have been made that a Winnipeg company will continue sinking operations on the Northern Manitoba vein; the shaft is already down 125 feet. It is rumored that the Rex mine will soon be reopened. Deals are pending which should result in a thorough investigation of the Gasse property, a prospect with considerable merit.

#### Rice Lake.

Several of the older Rice Lake companies have re-organized and some new ones have been formed. Some of these companies are offering stock for sale in the Winnipeg market. The public is safe-guarded in Manitoba to the extent that over sixty percent of the money received from stock sales must be spent in actual development work.

On the whole it may be said that in the opinion of men best qualified to judge, Manitoba is about to experience greater activity in mineral development than has ever fallen to her lot in the past.

#### NOTES FROM THE PAS.

Pleased with it all, and charmed with Northerners, the Duke and Duchess of Devonshire departed on Monday, after three delightful days in The Pas as guests of the town and Northland.—The Pas Herald.

The mining engineers of Flin-Flon syndicate will arrive in The Pas en route to the mines on Thursday, Sept. 25, it is stated by officials of the company. The object of the visit is for the purpose of further examination and to make preliminary arrangements for opening up the property. Mr. Raymond Brooks, who was here in 1915-16 in connection with this mine, will be a member of the party.

C. W. Greenlees is running a large force of men on a claim situated on the northwest arm of Schist Lake. This claim was staked by David Collins, and he found a large body of sulphide. He disposed of his interest to H. J. Bickle, who subsequently optioned it to Mr. Greenlees. The ore taken out resembles the Mandy, and Mr. Greenlees is exploring more fully to determine the tonnage and values.

Hon. Edward Brown is reported as saying that, unless the Dominion government builds a railway to the mines, from The Pas, the Provincial one will do it. All papers in Canada have carried this announcement, which concludes a warning that the Dominion government must act quickly.

This is of the greatest interest to the northland, and the importance of having this railway built, and at once, cannot be too strongly emphasized. It is the opinion of the Herald that if the Provincial government wants to get in right with the mining people of Canada, they can do so, by giving the Dominion government time enough to reply to a wire, stating they will or will not proceed with this line to-day.

# The Survey of Cornwall

By J. C. Murray.

There is both refreshment and profit in discovering for one's self the points of view of old writers on matters pertaining to mining. Mirth and edification walk hand in hand as one reads the pages of the volume whose title is displayed above.

Richard Carew, the author of "The Survey of Cornwall," was born in the year 1555, at "East-Antonie, in the eastern part of Cornwall, within some miles of Plymouth." As a youth such was his precocity that he became a gentleman commoner of Christ Church when but 11 years old. At 14 years of age he engaged in a public debate with the "matchless" Sir Philip Sidney. Concerning his subsequent career, there are but hazy accounts. What is certain is that he became an ardent observer of natural history.

In the year 1602, Carew published his "Survey of Cornwall," and dedicated it "to the Honorable Sir Walter Raleigh, Knight, Lord Warden of the Stanaries, Lieutenant General of Cornwall." His dedication is more than ordinarily ingenuous and naive. It commences:

"This mine ill-husbanded Survey, long since begun, a great while discontinued, lately reviewed, and now hastily finished, appealeth to your (Lordship's) direction, whether it should passe; to your correction, if it doe passe; and to your protection, when it is passed."

He prays that "each wel-minded Reader will wish a merrie passage, to this my rather fancie-sporting, than gaine-seeking voyage;" and, before getting down to real business, he indites a charming little "Prosopoeia" of five verses, one of which runs thus:

"I curry not with smoothing termes,  
Ne yet rude threats I blaste:  
I seeke no patrons for my faults,  
I pleade no needless haste."

Herefrom could many an over-deprecatory author learn wisdom!

Nearly every page of the "Survey" is tempting. However, we must content ourselves with those touching on mines and mining.

A brief sketch of the topographical features of the "Duchy" closes with the remark that "in the rest of this earthy description, I will begin with such minerals as her bowels yeeld forth. . . . These minerals are not so deepe buried in the entrailles of the earth, nor so closely couched amongst the Rockes, but that desire of gaine with the instrument of Art can digge them up: they may be divided into stones and metals."

Quarry-stones, pebbles yielded by the "sea-strond," slate, and limestone are successively dealt with. As to copper, our author confesses to small knowledge and less curiosity; for he states that at one mine the ore was shipped to Wales to be refined, whether to save cost of fuel, or to conceal the profits, he does not care to venture a guess.

Silver is dismissed with the statement that although it is found, nature has not been lavish, for "what she proffereth with the one hand, shee seemeth to pull backe with the other."

The tin miners, Carew asserts, found "little hoppes of Gold" in their ore. These they kept in quills and sold to goldsmiths, but with little or no profit.

Diamonds, he declares, are found cleaving to the rocks in which tin is mined. "They are polished,

squared, and pointed by nature," from which we may estimate Mr. Carew's acquaintance with crystallography.

On tin our worthy observer becomes eloquent: "But why seeke wee in corners for pettie commodities, when as the onely mynerall of Cornish Tynne openeth so large a field to the Countries benefit? this is in working so pliant, for sight so faire, and in use so necessarie, as thereby by the Inhabitants gaine wealth, the Merchants trafficke, and the whole Realme a reputation: and with such plentie thereof hath God stuffed the bowels of this little Angle, that . . . it overfloweth England, watereth Christendome, and is derived to a great part of the world besides." Thus delightfully does Carew ramble in dithy-rambic prose.

Amongst other things, we are told of the Cornish miner's belief that Noah's flood, moving from east to west, on its course to the sea, produced by denudation all the alluvial tin. Stories of the discovery of tin veins ("loads") by means of dreams are repeated, though the author carefully refuses to guarantee their credibility.

Prospecting is described succinctly, but picturesquely, in one paragraph. "Shoad," the drift "shed from the maine Load, and made somewhat smooth and round, by the waters washing and wearing" is sought for by casting up trenches five or six feet deep and three or four wide. Rivers are turned from their courses, a practice to be condemned as being "little beneficiall to the owners of the soyle" since the low grounds have "herethrough their wrong side turned outwards."

Prospecting to find the "loadworkes" begins by "conjecturing by the sight of the ground which way the flood came that brought it thither, and so give a gesse at the place whence it was broken off." At that place a shaft five or six feet by two or three feet is sunk to a depth of seven or eight "to prove whether they may so meete with the Load" . . . "But," advises the cautious Carew, "you may not conceive that every liklyhood doth ever prove a certaintie:

For divers have been hindered through bestowing charges in seeking, and not finding, and many undone in finding and not speeding, whiles a fair show, tempting them to much cost, hath, in the end, fayled in substance, and made the adventurers Banckrupt of their hope and purse." A fair epitome, this, of the whole matter.

Carew speculates engagingly as to whether or not tin minerals grow in the rock. He discreetly leaves the question open after quoting authorities pro and con. A rich tin vein is described as one that "carrieth a foote and a halfe in breadth, and is not overbarren," a definition worthy of the most non-committal geologist of today. To work such a vein, the discoverer, unless his purse is "lined beyond ordinarie," associates himself with some more partners, who are either practical "tinnners" or else adventurers willing to contribute money. The laborers, be it noted, worked for eight pence per day, or, if paid by the year, for from four to six pounds, out of which wages they paid their own keep.

Should the new mine assume respectable proportions it was duly christened and a mine overseer, or captain, appointed. In most places, according to Carew, the

toil was so extreme that a shift lasted only four hours, no miner working more than the one shift. "The residue of the time they wear out at Coytes (quoits), Kayles, or like idle exercises. Their Kalinder also alloweth them more Holy-dayes than are warranted by the Church, our lawes, or their own profit." Carew had first-hand experience of the Cornishman's passion for pastimes, some of them so strenuous as to result in serious wounds and even in deaths. Farther on in the "Survey," in discussing the rough game of "Hurling to the Countrie," he remarks that the players retired home as from a pitched battle. Yet there was always evident the sporting spirit. "All is good play, & never Attourney (lawyer) nor Crouner (coroner) troubled for the matter."

To proceed with mining, however. The manner of working was "to follow the Load as it lieth, either side-long, or downe-right."

But here our friend Carew falls into heterodoxy by asserting that "both waies the deeper they sincke the greater they find the Load." Alluding to open stopes, he states that "from some of their bottomes you shall at noone dayes discerie the Starres." The miners were let down and hoisted up in a "stirrup" by two men on a windlass. Shaft-sinking and drifting and the problems of ventilation are mentioned. Sympathy is expressed for the poor miners who meet death through falls of rock. Foul air and mine-gases are thus touched on. "While they (the miners) thus play Mouldwarps, unsavorie Damps doe here and there distemper their heads, though not with so much daunger in the consequence, as annoyance for the present." Sometimes the rock was so hard that a good workman could "hew" only three feet in as many weeks. Pumping was effected by man-power, horse-power, and water-wheels where drainage could not be had by means of "addits" (or "audits"). Carew marvels greatly at the engineering skill of "otherwise thicke clouded braines" in driving these "audits."

He is also wonder-stricken that the operators should be "anyway able to acquite the cost" of the subsequent dressing, breaking, and stamping of the ore. The stamping-mill of the day, which the ore was conveyed either "in waynes or on horses' backs," consisted essentially of "three, and in some cases sixe, great logges of timber, bound at the ends with yron, and lifted up and down by a wheele, driven by the water." From the stamping-mill the ore passed to the "crazing" mill, where it was fed between two grinding-stones (actuated by water or man-power) and there "brused" (bruised) to a fine sand.

But innovations were already creeping in. "Of late times," the author remarks, "they mostly use wet stampers, and so have no need of the crazing mills for their best stuffe, but only for the crust of their tayles."

The process of concentration was carried on by means of riffing the crushings over green turfs, three or four feet square and one foot thick. The concentrate was put into a wooden dish, broad, flat, and round, "being about two foote over, and having two handles fastened at the sides, by which they softly shogge the same to and fro in the water betweene their legges, as they sit over it, until whatsoever of the earthie substance that was yet left, be flitted away." But mark again the march of progress. "Some of later time, with a sleighter invention, and lighter labour, doe cause certaine boyes to stir it up and downe with their feete, which worketh the same effect."

Each partner in the venture then carried his portion to the "blowing house," where it was melted and cast into "peeeces of a long and thicke squareness, from three hundred to foure hundred pound weight, at which time the owners mark is set thereupon." Once again Carew marvels wherein can lie the profit in going to such extraordinary pains—two or three months of extreme and increasing labor, numberless dangers and vicissitudes, and, last, but not in his opinion least, the "tynners" ugly countenances, tanned "with smoake, and besmeared with sweate."

The melting was done in lightly constructed thatched buildings. Once in seven or eight years these were burned down to recover the mechanically lost tin.

After reference to "coynage," the account concludes with allusion to the bargaining between metal-buyers and sellers. The former brought long tales of bad markets, idle stocks, dangers of piracy by sea, rumors of war, and so on, in their efforts to depress prices. "The owner, on the other side, stoppeth his eares against these charmes," and grows eloquent on the scarcity of tin and the waxing expense of winning it.

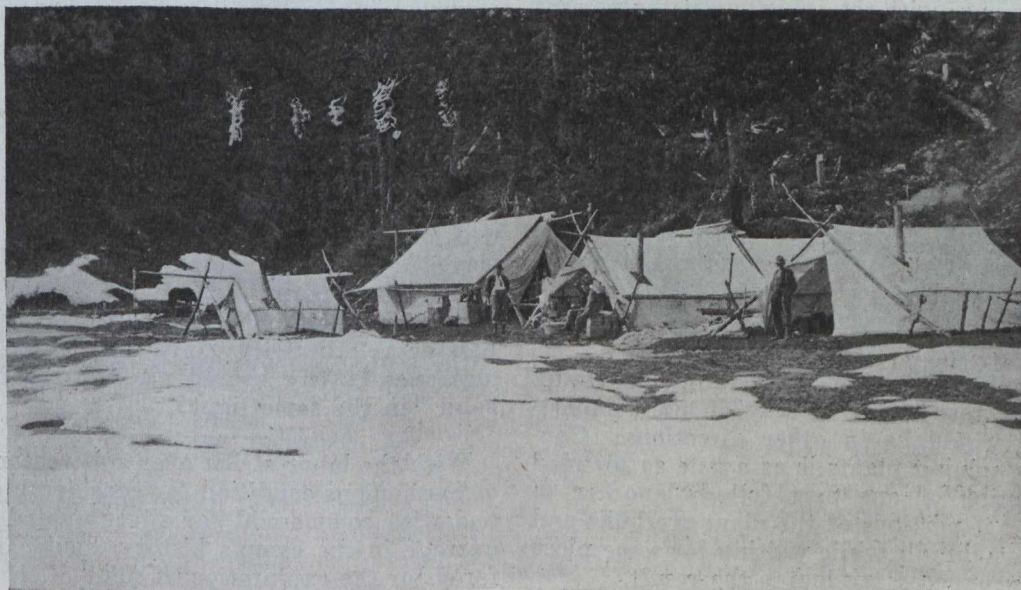
It is impossible to reproduce the charm of Carew's volume. Part of it lies in the quaint and uncertain spelling, part in the diction, which is tinged throughout with Cornish idiom despite the author's Oxford erudition. But mostly it consists in remarkable keenness of observation and frankness of expression, together with a gift for moralizing that is typical of the spacious times in which Richard Carew, Esquire, of Antonie, in the Duchy of Cornwall, lived, moved, and had his being.—Mining and Scientific Press.

In the case of Wellington Colliery vs Pacific Coast Coal Mines, Limited, in which the plaintiff company sought damages for trespass, alleging that the defendant company some years ago had gone on their property and extracted a considerable tonnage of coal, the Appeal Court of British Columbia has handed down judgment in favor of the Pacific Coast Coal Mines, Ltd. This reverses the decision of the Supreme Court Judge, who found that trespass had been committed and that the Wellington Colliery Company was entitled to substantial recompense. Chief Justice J. A. MacDonald, of the Court of Appeal, puts his judgment in few words which, in part, follow: "The question is purely one of fact, and when we have the evidence of two witnesses, whose credibility is not called in question by the learned trial judge, and who are men of standing in their respective callings, who give explicit evidence that the respondents' late manager consented to the acts complained of, his authority to do so not being questioned, and when that evidence stands uncontradicted by any other witness and is not rebutted by any other fact or document put in evidence, there can, in my opinion, be no doubt as to the course which I ought to pursue. I must either accept the evidence of these two witnesses or in effect declare that they have been guilty of perjury. In the circumstances of the case there is no reason for mistake. The consent was either given, as these witnesses have deposed to, or their evidence is false to their knowledge. We were asked to draw certain inferences in rebuttal of their evidence from what took place at an interview between Michener and Fleming, but such inferences are not necessary ones and cannot, in my opinion, prevail against the positive sworn testimony."





Showing camp at Big Missouri Mine, Salmon River, with Hon. Wm. Sloan, Minister of Mines of British Columbia, in the foreground. This was taken during Mr. Sloan's July, 1919, tour of the northern mineral districts of the Province, which now are attracting considerable attention.



General view of the camp, back of which is the property, which is owned by Sir Donald Mann and associates and now is being developed extensively by means of diamond drill. The Big Missouri is expected, by those interested in it, to have as great a future as a silver producer as the Premier, which already is widely known among mining men as one of the most promising prospects of the Canadian West. It will be noted that snow still is present, although the pictures were taken in mid-summer.

# The Steam Pump as a Factor in the Development and Operations of Mining Properties

By F. A. McLean.

Few people to-day realize to what a large extent improvements in mining practice have been dependent on the development of the steam pump nor the importance of the influence which the invention of the latter has exerted on the evolution of the steam engine.

Before the advent of the steam pump, water was removed from mines by means of buckets or antiquated wooden sucker or pitcher pumps, and it is a significant fact that all of the earliest workings in England, in China and other parts of the Orient, as well as in the United States, and Canada, were abandoned as soon as water was encountered in larger quantities than could be successfully handled by these methods.

The history of modern mining methods dates back only to the invention of the steam pump, the evolution of which has not only made extensive mining operations possible but has been indirectly responsible for the invention and wide application of the percussive rock drill for with this invention was inaugurated a new phase of civilization very aptly termed "The Age of Steam."

The invention was of such importance mechanically that it is doubtful if the steam engine would ever have been perfected were it not for the incessant demands for some form of prime mover, made necessary by the rapid expansion of the extractive industries which followed the inception of the steam pump. In its earliest forms the steam engine was little more than an adaptation of the mine steam pump and not always a successful one at that. From this point the improvement of the one has kept pace with the other till at the present day the modern steam engine and pump are a far cry from the crude form of mine pump from which they sprang.

Mining progress is still dependent on the pump, not because the development of the latter has not kept pace with the former, but because pumping equipment is not used as often or as much as it should be. Many mine officials through a mistaken desire to keep down operating expenses try to get along without a pump, or else endeavor to use an old or broken down one until they have wasted several times the cost of a good pump, which they usually have to buy in the end.

Time is generally a very important factor in mining and losses in this respect are usually of more importance than they would be in other directions. Construction of new mining plants is as a rule so planned that the completion of one part follows another in logical order and if portions of the plant are built and then forced to remain idle while waiting for some piece of equipment, an unnecessary loss is the result.

Sometimes a mine is forced to operate at only one-half or one-third of its normal tonnage while awaiting the pumping out of some shaft or drift which has been flooded or drowned out. In the case of newly opened mines, a railway siding may remain idle, or an expensive boiler and engine or compressor plant is shut down, or operated at a very small part of its capacity, because some portion of the development is under water.

With the many forms of portable electric, gasoline, and pneumatic pumping outfits for temporary use, as

well as the improved forms of gasoline, electric, steam engine or steam turbine driven centrifugal pumps for permanent installations now on the market, there is no necessity for the protracted delays which characterized the early years of mining history. There is no reason at the present time for a mine manager to say, this shaft will be sunk or this tunnel driven in so many days if we don't strike water. Portable pumps guard against such contingencies and impart a degree of assurance and certainty to the work which could not be felt in the past. It is, of course, necessary to have the pumps at hand ready to be called forth at a moment's notice in case of emergencies.

The successful mine superintendent or manager looks ahead, and realizing the difficulties before him, takes the proper precautions to overcome them or turn them aside, while the unsuccessful one either fails entirely to look ahead or when he has done so, does not make any allowance for contingencies.

Nowhere is this fact more true than in the purchase of mine pumping equipment. Many mine superintendents, either through forgetfulness or indifference, do not place an order for their pumps of small size until they are actually badly in need of them, and then have to wait for their purchasing agents to secure them through the usual channels with all the accompanying delays and red tape.

In most cases the pumps should be ordered far enough ahead so as to arrive at the mine as soon as the timbers, whether the opening is to be a shaft, slope, or tunnel. The probabilities are that in any event water will be struck within a few days and it must be expected eventually. With the pumping equipment on hand a reasonably economical removal of the water, and a steady progress with the work is assured. Large mines will find it to their advantage to keep a number of small pumps on hand, as the capital invested in them need not be large and when properly stored they will not deteriorate. The money invested in this way may be regarded as the premium on an insurance policy that guarantees as nearly as possible against the interruption of operations through water troubles. Few of us object to paying a premium on life or fire insurance. Why should we not regard "pumps on hand" in the same light?

With the labor strike over and reasonable prospects of harmonious condition for considerable time to come, and with commercial bar silver quoted at the highest average in the camp's history, double incentive is offered for the exploration of some of the old but promising Cobalt properties which have lain idle for the past several years. This, in addition to the aggressive development of the producing mines.

Among the probable new operations will be the Farah property now owned by the Nipissing Extension Company. Also, it is understood, the old Hylands property will be opened up.

On the Hylands a thick layer of keewatin formation overlies the diabase and the geological conditions appear to be favorable. The property lies north of the Ophir.

**CANADIAN COAL MEN.**

The Canadian Mining Institute recently appointed a Special Committee to consider the formation of a Coal Mining Section, and on this Committee, Mr. Thomas Graham, the subject of our sketch, was named, which, we take it, is sufficient evidence of his right to be classed among the representative coal men of Canada.

Mr. Graham was born in Ayrshire, Scotland, on Christmas Day, 1867, and we should imagine has proved not a bad Christmas gift to his folks. He received, like so many of his countrymen who have succeeded abroad, a common school education, a privilege which Scotland affords to her sons of a character, which it is no disparagement of native ability to say, accounts largely for the dominance of Scotchmen in mercantile pursuits abroad.

Mr. Graham came to Canada in 1888, and worked as



**THOMAS GRAHAM,**  
Gen'l Supt. Canadian Collieries (Dunsmuir), Ltd.

a miner in Lethbridge, Alta., until 1893. The next nine years were spent in Montana, Wyoming and Colorado. After a short return to Canada occupied as foreman at No. 2 mine of the Crows Nest Pass Company, Mr. Graham became superintendent of the Skagit Coal & Coke Co. at Cokedale, Wash. In 1904 he returned to Canada as Superintendent of the Western Fuel Company at Nanaimo, B.C., and continued in this position until the end of 1911, when he was appointed Chief Inspector of coal and metalliferous mines in British Columbia. This position he resigned in April, 1917, to accept the position of General Superintendent of the Canadian Collieries (Dunsmuir) Limited, which he now holds.

Mr. Graham's connection with the Canadian Mining Institute dates back to his election as a member in 1908. He was Chairman of the Western Branch of the C.M.I. in 1916. He was elected President of the Mine Inspectors' Institute of the United States in 1916, holding over the two years the United States was in the war, and still holds this office.

**PIONEER MINE ENGINEER JOINS GREAT MAJORITY.**

Charles McConnell, a native of California, and a foremost mining engineer of the gold and silver camps of the North, is dead. He vied with Manager McCluskey, of the McKinley-Darragh Mine, as to which was the longest in the camp. No one disputed their claims as to being the pioneers.

Mr. McConnell had been a big man for the North and a big man for the financial and speculating people of the United States. Not only was he connected with



**CHARLES MCCONNELL.**

the development of many valuable properties, but he made hundreds of trips to New York to interest investors in properties and succeeded in bringing much American capital to the North. He had a big New York connection.

In 1905 Mr. McConnell was connected with the Hargraves Mine. Later he was with the Red Rock, then the Trethewey, the Walkman, Touch Oakes' Gold Mine and up to the time it fell prey to the bush fires this Spring, he managed the Patricia at Boston Creek.

His wife was a daughter of Senator Clemow, Ottawa, and she, with three children, survive.

## Special Correspondence

### BRITISH COLUMBIA.

#### The Collieries.

##### Coal Selling Prices Advanced:

Coal continues to advance in price in British Columbia, the quotation per ton to the consumer now being \$11.50 a ton, as compared with the \$6.50 asked before the war. The explanation, of course, is the high cost of production, although there is a disposition in some quarters to doubt whether the value placed on the fuel is justified. The jump from \$6.50 to \$11.50 did not come at once without notice. The process has been more or less gradual. During the war there was an investigation into production costs authorized by the Dominion Fuel Controller and, as a result, the price of coal at the bunkers of the various companies was fixed. Since the first of the present year the coal miners have received increases to their wages. Those employed by the Canadian Collieries (D) Ltd., the Pacific Coast Coal Mines, the Nanoose Collieries, and other companies, with the exception of the Canadian Western Fuel Co., have had their pay raised at intervals in proportion to the increase in the cost of the necessities of life. The extent of the additions to their pay envelopes is shown by the following table:

| Date of Increase         | Amount per day.                  |
|--------------------------|----------------------------------|
| February 1st, 1919 ..... | 23 <sup>3</sup> / <sub>4</sub> c |
| May 1st .....            | 21 <sup>1</sup> / <sub>2</sub> c |
| August 1st .....         | 15 c                             |

Total .....

201<sup>1</sup>/<sub>4</sub>c  
The men of the Canadian Western Fuel Company did not come within the general arrangement which brought to the employed of the other companies these increases. Recently, however, their representatives waited on the management and pointed out that their wages were not sufficient to meet the demands of the day on the purse of the householder. After some negotiation the company, recognizing the position in which the men were placed, agreed to advance the men's pay all round to the extent of 25c a day, and the same went into effect on the 1st of September.

With the increase in the miner's pay the companies, as was expected, there were some changes in the price of domestic coal at the bunkers and, to make the cycle complete, advances were recorded, almost simultaneously, by the retailers. On April 1st last the latter announced an increase of 50 cents a ton; on June 29th there was added another 50 cents; and on September 1st there was a further addition of 75 cents. Thus, since the beginning of the year, the retail price of domestic coal in this province has climbed \$1.75 a ton.

While it is not expected that there will be any shortage of coal in the Pacific Northwest this winter it is a noteworthy fact that the miners have not been working full time during the summer. Owing to slack trade the Reserve Mine was closed down on the 30th of May, previous to which time the mines of the Canadian Western Fuel Company had been operating only four days a week. With the Reserve inactive it was thought that the other mines could be kept producing to capacity but this did not prove so evidently, as the other mines thereafter were worked an average of only 18 days a month.

All the Island Mines, as a matter of fact, have been working short time since the month of April and a

careful computation of the loss in output from that month to the present date because of slack trade shows that it reached the substantial total of 192,807 tons. In this connection Hon. Wm. Sloan, Minister of Mines, has had prepared the following statistical table indicating how this loss was distributed among the various operating companies:

A detailed statement of days worked by different mines on the Island and estimated loss of tonnage through there being no demand, is herewith submitted up to the 31st of August, 1919.

#### Canadian Western Fuel Company.

| Loss of time by mines in | Days. | Loss in Tonnage. |
|--------------------------|-------|------------------|
| March .....              | 3     | 7,566            |
| April .....              | 4     | 10,449           |
| May .....                | 8     | 21,336           |

#### Reserve Mine Closed Down.

| Loss of time other mines | Days.                         | Loss in Tonnage. |
|--------------------------|-------------------------------|------------------|
| June .....               | 9                             | 20,664           |
| July .....               | 8                             | 19,376           |
| August .....             | 1 <sup>1</sup> / <sub>2</sub> | 3,057            |

Reserve mine closed down June, July, Aug. 77 29,800

Total loss in tonnage through slack trade .....

#### Canadian Collieries, Extension Mines.

| Loss of time by mines in | Days. | Loss in Tonnage. |
|--------------------------|-------|------------------|
| April .....              | 2     | 1,610            |
| May .....                | 3     | 2,616            |
| June .....               | 6     | 4,782            |
| July .....               | 4     | 3,220            |
| Aug. ....                | 3     | 2,346            |

Total .....

#### Comox Mines.

| Loss of time by mines in | Days. | Loss in Tonnage. |
|--------------------------|-------|------------------|
| April .....              | 5     | 12,150           |
| June .....               | 2     | 3,074            |
| July .....               | 6     | 12,534           |
| Aug. ....                | 8     | 15,688           |

Total .....

#### South Wellington Mines.

| Loss of time by mines in | Days.                         | Loss in Tonnage. |
|--------------------------|-------------------------------|------------------|
| May .....                | 3                             | 1,014            |
| June .....               | 2                             | 444              |
| July .....               | 10                            | 4,350            |
| Aug. ....                | 3 <sup>1</sup> / <sub>2</sub> | 1,152            |

Total .....

#### Pacific Coast Coal Mines, South Wellington.

| Loss of time by mines in | Days. | Loss in Tonnage. |
|--------------------------|-------|------------------|
| March .....              | 2     | 440              |
| May .....                | 6     | 1,848            |
| June .....               | 8     | 2,592            |
| July .....               | 8     | 1,864            |
| Aug. ....                | 1     | 271              |

Total .....

#### British Columbia Coal Mining Company.

| Loss of time by mines in | Days. | Loss in Tonnage. |
|--------------------------|-------|------------------|
| Feb. ....                | 2     | 248              |
| March .....              | 1     | 111              |
| April .....              | 6     | 600              |
| May .....                | 7     | 546              |
| June .....               | 1     | 141              |

Total .....

**Nanoose Collieries.**

|                                       | Days. | Loss in Tonnage. |
|---------------------------------------|-------|------------------|
| Loss of time by mines in Feb. . . . . | 19    | 1,900            |
| " " " March . . . . .                 | 10    | 1,180            |
| " " " April . . . . .                 | 23    | 1,035            |
| " " " May . . . . .                   | 20    | 1,320            |
| " " " June . . . . .                  | 9     | 792              |
| " " " July . . . . .                  | 7     | 700              |
| Total . . . . .                       | 88    | 6,927            |

**By Vancouver Island Mines.**

Total loss of output through slack trade during 1919 equals 192,807 tons.

**New Coal Developments:**

A promising coal property situated about two miles west of Midway, B.C., and owned by the Boundary Mining & Exploration Company, which has been idle during the war, is likely to be developed. At a recent meeting of the shareholders of the Company, held at Cranbrook, B.C., a debenture issue was authorized to provide the funds necessary and it is expected that a substantial proportion of the same will be taken up by the shareholders. James Finch, of Medicine Hat, Alberta and E. B. Sawyer, of Spokane, were elected president and vice-president of the company. The property to which attention is to be directed has been developed to the extent that a seam having a general width of from four to eight feet has been exposed. Two tunnels have been driven, one 400 and the other 200 feet.

A considerable investment of capital in the development of Vancouver Island coal lands, situated in the vicinity of Nanaimo, B. C., is promised by Frank Carrel, proprietor of the "Quebec Daily Telegraph," who with other Eastern Canadians, is interested in these properties. Mr. Carrel returned a short time ago after making a trip to the Canadian West.

**The Metal Mines.**

**Nelson, B.C.**—On the property of the Electric Point Mining Company, which is situated south of the international boundary near Waneta, a new chimney of ore has been uncovered on which development is proceeding. Located on Gladstone mountain, about 12 miles from its shipping point, the Electric Point has a carbonate and sulphide ore, practically free of zinc and containing little silver. It occurs in large chimneys, 40 to 48 feet in diameter. The mine has been developed for the past four or five years almost exclusively by sinking with cross-cuts to connect the shafts, the depth of 800 feet being attained. The same lead ore belt is being developed on the Canadian side, where Messrs. Waldbeser & Reeves have opened a large low-grade vein on the low divide between the lower Salmon River and the Pend d'Oreille.

With further reference to the Eureka Mine it is announced by H. H. Vincent, president of the Vincent Development Company, which is handling the development of the combined Eureka-Granite-Poorman property for the Inland Mining Company, that the surveying of the 6,000 ft. extension of the tramway has been completed and that a contract for its construction will be awarded immediately. Mr. Vincent has inspected the work at the mines recently and reports that a car of concentrates is ready for shipment to the Trial Smelter. He says that it is much cleaner and better than that shipped in the month of August, owing to the

tuning up of the Granite-Poorman Mill and to other improvements effected in the interval.

**Merritt, B.C.**

A systematic sampling of the iron ores of this district has been in progress recently with results which are described as satisfactory. Specimens were taken from Iron Mountain, the Titanic Group, the Porter Claims and from the Nicola District. While the assay returns are not all to hand those available run between 48 and 66 per cent hematite iron. Interested parties believe that this supply will solve the problem of the treatment of the large known deposits of magnetite of the Pacific Northwest by means of the blast furnace. On the other hand the extension deposits of limonite in the Bridge River District, carrying an exceedingly small percentage of objectionable impurities, is thought to assure a better flux for this purpose by others. W. M. Brewer, Government Mining Engineer, and a number of other experts, inspected the latter property this summer. Their reports have not yet been seen but from what can be gathered this limonite is deemed to be the ideal material for use with the magnetites of British Columbia in ordinary smelting practice. If this is so it would appear that the problem of the treatment of the magnetite referred to, a problem which has been concerning the Provincial Government and mining engineers for years and which led the former not long ago to obtain a report from Dr. Alfred Stansfield on the practicability of the treatment of these ores economically by means of the electric furnace, has been solved. However, until the new deposits are better known and have been proved up all that may be said on this point, after all, is speculation. This much, however, may be added: that capital is looking to the Canadian West with the idea of establishing an iron and steel industry and with the uncertainty as to fluxes for the magnetites which are known to exist in large quantity set at rest it is possible that the industry so much sought may become a realized fact before long.

**Vancouver, B.C.**

A representative collection of the ores of British Columbia was shown at the Vancouver Exhibition, which took place from the 8th to the 13th of September inclusive. There were attractive samples of silver, gold, copper, zinc, magnetite, wolframite, scheelite, cinnabar, bismuth, molybdenite, etc. displayed, the whole having been assembled under the supervision of the British Columbia Chamber of Mines. The exhibit from the Kootenays prepared by Fred A. Starkey, of Nelson, B.C., was one of the most prominent. It was a first-class index of the mineral wealth of that section of the Province. The lode properties of Sheep Creek, which are being extensively developed at present, were represented by specimens which attracted much attention. There were special exhibits also from the Surf Inlet Mines, the Dolly Varden Mines, the Britannia Mining Co.'s properties, the Granby Consolidated Mining & Smelting Co.'s mine at Anyox and elsewhere, the Canadian Consolidated Mining & Smelting Co.'s properties, the Drum Lummon, and the Bear River, Salmon River, and Portland Canal, gold silver, copper countries. The Skeena District and Gambier Island also were represented, as well as Alta Lake and Ypres, the two latter being on the line of the Pacific Great Eastern Ry. Another feature was samples of native and manufactured salts from the Basque Lake Deposits on the Thompson River near Ashcroft. Officials of the

Chamber of Mines, among whom may be mentioned specially W. Gray, the Secretary, as he had active personal charge of the exhibition, are to be commended for the satisfactory results of their efforts to prepare a display that would to some extent tell the story of British Columbia's mineral wealth. Prof. J. M. Turnbull, of the University of British Columbia, judged the samples.

#### Stewart, B.C.

Preston Locke, a mining engineer representing the American Smelting & Refining Co., Tacoma, Wash., recently visited the Portland Canal and Salmon River districts. Mr. Locke was favorably impressed with the development in progress. He said that the Remier and the Joker already were mines and there were many good prospects.

#### Great Activity in Northern Mines.

Just now there are many rumors of sensational developments in connection with the Big Missouri group of claims at the head of Portland Canal and 22 miles from Stewart, B.C.

A gold-silver ore body has been discovered on the Laura and E. Pluribus claims which has resulted in assays of from \$50 a ton to over \$600. One test showed \$200 gold and 414 oz. of silver to the ton. There is also an immense amount of ore running \$15 to the ton. Diamond drills are in operation, in some places being down 400 ft. and there is no sign of the ore body petering out.

Sir Donald Mann, who is now in Vancouver, holds the property under bond but refuses to say anything. It is said on good authority that he laughed at an offer of \$2,500,000 for the property. Professor Bancroft of the McGill University, department of mines; Mr. Minard, a mining engineer of New York and E. Campbell, mining superintendent for the Granby Consolidated, are now inspecting the property. Some of the largest mining concerns have shown interest in the property and made offers for purchase.

It is believed that the Provincial Government has more information regarding this than has been made public as they are spending large sums in wharves, bridges and trails in this district. Supplies have been sent to the Missouri group from Vancouver the last few weeks and the number of men on the ground has been doubled.

Sir Donald is making his second trip north in eight weeks and mining men who have watched developments closely state that this is one of the finest gold and silver properties in the world.

#### Ore Exhibits At Vancouver Exhibition.

Mr. Lloyd Thomas, director of the Chamber of Mines and director of the Exhibition, were in charge of the British Columbia Chamber of Mines' exhibit at the Vancouver Exhibition, Sept. 8 to 13. They were assisted by Mr. K. Milne and Mr. H. W. Poole, returned soldiers, who are taking the assay course at the University of British Columbia. Their energetic efforts resulted in a splendid showing at the Exhibition this year. The display including every known grade of ore in British Columbia and many samples from outside districts, was the best ever collected in B.C. and one of the finest in Canada.

Considerable space in the Forestry Building was taken up by the exhibit and if the ore in sight were run through the crushers and concentrators there would result many thousands of dollars worth of copper, gold, silver, platinum, lead, zinc and other minerals.

A large collection of rare stones and minerals gathered from all over the world caused considerable interest.

It would be hard to select the most interesting exhibit, there were so many attractive ones. Much attention was shown to that from Nelson, which contained ores from Ainsworth and Sheep Creek. There were also special exhibits from Surf Inlet, the Dolly Varden, Britannia, Granby, Trail, Drum Lummon, Bear River, Portland Canal and a score of other districts. Good samples were on exhibit from R. N. Neill's famous Premier mine. The far-famed Engineer mine of Atlin had a fine exhibit of gold ores. An interesting display was that of concentrates from Surf Inlet gold ores, Ypres on the P.G.E., Gambier Island, Alta Lake, the Skeena, Queen Charlotte Islands, the Bush mines, were all to be seen in good array. There was silver and gold, copper and zinc, magnetite, wolframite, scheelite, mercury, bismuth, molybdenite and a score of other desirable metals and ores, and many other exhibits too numerous to mention.

A Faust concentrator was in operation showing the gold running over the tables. The concentrator handled at different times gold, silver, lead and zinc. Mr. F. H. Lamey was in charge and explained the process.

The display of mining machinery and equipment proved of great interest.

#### List of Awards.

The judge of the mineral exhibits at the Vancouver Exhibition was J. M. Turnbull, B.Sc., professor of mineralogy, University of British Columbia. Following is the complete official prize list:

Best exhibit of natural mineral salts, Basque Chemical Product Co.

Best general exhibits of ores, first (gold medal), Kootenay district, entered by Fred A. Starkey; second (silver medal), Portland Canal district, entered by Stewart Prospectors' Association.

Exhibits of ores from mines in various districts, first (gold medal), Kamloops, entered by Max Cameron, from the Kathleen group; second (silver medal), Coast district, from the Drum Lummon Mines.

Best exhibit of silver ore, Dolly Varden Mines.

Best exhibit of copper ore, Drum Lummon Mines.

Best exhibit of gold ore, Surf Inlet Gold Mines, Ltd.

Best exhibit of gold-copper ores, Bowena Copper Mines, Ltd.

Best exhibit of coal tar products, The Barret Co.

Best exhibit of molybdenite, Index Molybdenite Co.

Best exhibit of hand samples by individual prospects, first, Gretna group, Alberni district; second, P. Gillhoe, Spence's Bridge, and third, D. A. McKinnon, Vancouver.

The Drum Lummon Mines entered a splendid exhibit which attracted much attention from mining men. The specimens were taken from a mine on Douglas Channel, which is now shipping high grade ore and concentrates. The ore body is bornite and chalcocite with free gold.

**NORTHERN ONTARIO.**

The new policy recently adopted by the Baldwin Gold Mining Company in disposing of treasury shares without commission or brokerage charge is one that is looked upon with considerable favor in Northern Ontario. While it is only reasonable that in a good many cases there should be more or less expense in connection with disposing of shares in new mining enterprise, and while there has been no general complaint against charging commission sufficient to make it worth while for financial and brokerage houses to use their organization for the purpose of financing new developments, yet there have been a number of instances where the commissions charged, or the rake-off secured by the underwriters has been decidedly unreasonable.

The general impression appears to be that if other new companies would adopt a somewhat similar policy as has the Baldwin the ultimate result would be more favorable in that the money subscribed for shares would actually find its way toward development work, and not be "carved" to such an extent as to allow pennies to be devoted toward mining where in reality dollars may have been subscribed.

According to opinion in the north, it would perhaps be too much to expect that all new companies could arrange to do their own financing. Indeed, many of the brokerage firms are performing excellent service in raising finances for the development of mining properties. The impression appears to be that these concerns should continue to be encouraged, and an endeavor made to eliminate any of the concerns which abuse their privileges. In this such a policy as that adopted by the Baldwin Gold Mines should help, while the intention of the Ontario Government to enforce the Ontario Companies' Act should in a general way serve to elevate Ontario mining promotions to their proper plane.

The Argonaut Gold Mines, Ltd., a company which was recently organized for the purpose of taking over La Mine D'Or Huronia as well as a number of the adjoining claims, has completed the re-construction of the mill which was installed on the property several years ago. It is planned to use the mill as a testing plant for the time being.

The property is situated close to Beaverhouse Lake, along the east boundary of the township of Gauthier, in the Larder Lake district. Gold was discovered on the property several years ago, since which time considerable exploration work has been done. In a general way the result of exploration work has been quite favorable, and under efficient management and properly financed, the proposition would appear to be a mine in the making.

The Argonaut Gold Mine, Ltd., is stated to be a closed corporation. Mr. J. H. Rainville, ex-Deputy-Speaker in the House of Commons, being the president. The majority of those interested in the company are resident in Montreal, the head office of the company being in the Royal Trust Bldg., of that city. Mr. J. E. Hardman, of Montreal, is consulting engineer, while John W. Morrison has been engaged as general superintendent. Mr. Morrison is well known in this district, having managed the Lake Shore Mine of Kirkland Lake for a number of years.

During the week ended Sept. 12, the Coniagas shipped two cars containing approximately 137,125 pounds of ore. This is the first shipment from the Cobalt camp since the ending of the strike on the 7th inst.

During the course of the labor strike, the McKinley-Darragh was the only company to ship ore, while the Nipissing sent out a limited amount of silver bullion which had been held in storage at the mine.

The Nipissing Extension Mines, Ltd., which was just recently incorporated under the laws of Ontario, has since purchased property formerly owned by Nipissing Extension Mining Company, as well as the property formerly owned by the Farah Mining Company. It will be recalled that a discovery of high grade ore was made at outcrop on the Farah property in June, last.

The company has an authorized capital of \$3,000,000, some \$2,000,000 of which is outstanding and with \$1,000,000 in the treasury.

A. J. Young, president of the new company, is well known in the north, being president of the Northern Customs Concentrators, Ltd. The vice-president, W. E. Stevenson, was formerly a director of the Temiskaming and other companies, and at present is a director of the Beaver. Hon. Albert Loening, New York, who is a director once served as United States Consul in Europe, and was a former commissioner of Texas for the city of New York. John W. Pickup, one of the directors, is a member of the firm of Fasken, Robertson, Chadwick & Sedgewick, and is intimately associated with a number of the mining companies operating in this district. M. Abbott Kimball, New York, is also a director of the new company.

Major Birkett, who will be resident manager, is a graduate of Queen's University and the Kingston School of Mines. In the early days he was in Cobalt, and later entered the Gowganda field. At the time of the outbreak of war he was general superintendent of the DeLamar Mine, Idaho, and which was then owned by the London Consolidated Mines Company, at which time Major Birkett joined the Canadian Expeditionary Forces.

"A collapse in the cost of material, the cost of labor and the cost of living is in sight," declared a prominent mining man during the course of an interview this week with the writer. "The producing capacity of plants in the United States in 1914 was twenty-four billion dollars. The producing capacity of plants in that country is at present ninety billion dollars. Figured on a basis of prices obtaining in 1914 the present capacity is fifty billion dollars, or an increase of over one hundred per cent. The population of the United States increased only ten per cent, and ninety per cent of the increased output has been absorbed in foreign countries, the majority of which will now reduce imports to a minimum. The result will be unprecedented competition in the United States, followed by the closing of a large number of plants, a collapse in prices, very considerable unemployment, and a collapse in wages."

Asked as to what effect such a development would have on the mining industry, this mining man declared that it would "mark the commencement of one of the greatest booms ever known, particularly in connection with the gold mining industry. This, owing to the fact that the greater the collapse in wages the cheaper it will be to produce gold, and the greater the collapse in the cost of material and supplies, the greater will be the purchasing power of gold." He further declared that, in his opinion, as a result of developments of the immediate future the intrinsic value of gold mines would record a steady increase, and that already many big financial concerns were seeking opportunities

to place large sums in the shares of the important gold mining companies.

As though in corroboration of this view, is the statement by H. C. Hoover, who on his arrival at New York from overseas declared that "we have entirely passed the crest of high prices."

After examining a group of claims situated in the township of Katrine in the Larder Lake gold area, the Nipissing Mining Company has not been sufficiently encouraged to take over the property.

It is understood that some high grade gold ore is in evidence, but occurs chiefly in quartz stringers, and with the stringers not numerous enough to make the entire dike in which they occur of commercial value.

The proposition, it would appear, is characteristic of the Larder Lake district, where high grade shoots are found to be narrow and isolated, and where, according to government geologists, the success of mining will depend upon whether or not bodies of low grade ore will develop in sufficient quantity to be profitable to mine.

Cross-cutting at the top of a raise from the 310-ft. level a new vein has been encountered on the Adanae. At the point where cut the vein is about three inches in width, the composition being calcite containing fairly heavy leaf silver. It is too soon to be able to tell whether or not the find will prove to be of importance.

The Dome Mines, treating ore at the rate of upwards of 900 tons daily, and now taking steps to increase working forces by another hundred men, would appear likely to be operating at full blast before the end of the current year. The addition of 100 men to present working forces should serve to add about 400 tons daily above the present rate, and bring the plant up to full capacity of around 1,350 tons daily.

Development work is understood to continue favorable, and there appears to be an altogether optimistic outlook for the mine.

In some instances very considerable difficulty is still being experienced in securing a satisfactory number of men with which to carry on operations at the desired capacity at some of the mines in the gold district. The general impression appears to be that the arrival of winter will in all probability bring the desired relief, and, instead of working under capacity, the influx of men due to increasing unemployment in the cities will make it possible to operate at full blast.

The situation appears to offer an opportunity for the excess labor supply in the larger centres in old Ontario, to be absorbed in part at least in the gold mines of the Porcupine district where working and living conditions are very favorable, and where high wages are being paid. Working at a mine does not necessarily mean working underground. Forces are divided between surface and underground, some working in the mining plants and mills and others preferring to work underground. During the winter months the majority endeavor to get underground work where the temperature always remains the same, winter or summer.

Work is being carried on aggressively on the property of the Boston-McCrea Company, in the Boston Creek district. Although it was only during the past summer that the new company was formed, a large

amount of exploration work has been done, and a number of important discoveries have been made.

Before commencing operations, Alfred R. Whitman, mining geologist, was engaged to examine the ground and offer advice. As a consequence of this, the work carried on has been systematic. So far, work has been confined to exploring the surface, and sinking shallow test-pits. Tellurides of gold have been found to occur in spectacular quantities, and assays show a gold content in the various deposits ranging all the way from around \$1 or \$2 to as high as several thousand dollars to the ton. Just as soon as the vein system is thoroughly explored on surface, the work of developing the more important veins will be gone ahead with, toward which end an electrically driven mining plant will be installed and sinking operations commenced.

During the past week a party of visitors, among whom were the following, spent several days at the property: E. L. Wettlaufer, Toronto; Geo. W. Morris, James W. Savage and C. F. Jordan, Buffalo; and N. W. Kirkpatrick, Dayton, Ohio.

With about 58 per cent of the total gold output of the Dominion coming from Northern Ontario, and with a probable extensive increase in output during the next year or so, the gold mines situated in the district of Temiskaming are taking on added importance. According to present indications, the gold mines of Porcupine and of Kirkland Lake, during 1920 will produce approximately seventeen per cent as much gold as the total output of the United States for one year. In spite of the present shortage of labor at Porcupine the production is now averaging close to one million dollars every thirty days. For the whole of 1920, with the labor dispute at Kirkland Lake settled, and with adequate working forces at Porcupine, and with the addition of one producer in the Boston Creek district, the output should exceed fifteen million dollars for the year.

According to the annual statement, the Porcupine Crown Mines, Limited, had a surplus of about \$260,000 at the beginning of 1919. At the annual meeting held January 22nd, 1919, it was announced that ore reserves approximated \$500,000. Owing to adverse economic conditions caused by the war, the mine was closed down about the middle of 1918. In the early spring of 1919 it was re-opened, but at the beginning of September the mill was still idle. It is planned, however, to resume production at an early date. The company is recognized as being conservative and the management is efficient. At the middle of September quotations on the open market place a value of from 31 to 32 cents a share. Taking all visible evidence into consideration the current quotations appear reasonable, and, with production once more under way a limited increase might follow. Up to the end of 1917 the company had paid dividends at the rate of 12 per cent annually. As to whether or not such a high rate can again be established seems problematical, although a moderate return for a limited period appears probable. The mine secures its income from one vein which has already been developed to a depth of 1,100 feet. For this reason it does not present very great possibilities of adding to ore reserves to more than more or less limited extent. The mine is equipped with a first class mining plant and a mill with a capacity for treating about 140 tons of ore daily. At from 30 to 40 cents a share it appears comparatively safe.



**NOVA SCOTIA NOTES.**

The Nova Scotia Steel & Coal Company is understood to be developing the lower seam in the Jubilee Shaft at Sidney Mines. The so-called Jubilee seam has two divisions, known as "Jubilee 'A'" and "Jubilee 'B'". The top seam has been worked more extensively, but the coal it produces is not suited for metallurgical uses, and it has not been found possible to work this seam as regularly as the other seam in the Sidney Mines area. About twenty years ago a shaft was sunk to the lower seam, and a small area of workings was developed around the shaft bottom, after which the mine was temporarily abandoned. Quite recently a new shaft was sunk, also reaching the lower seam. For some time three headings have been driving to connect the old and new shafts and these headings have now been driven through. In the lower seam it is understood that a long wall face is developed, and if other conditions prove satisfactory, the output from this lower seam can be increased to any desired extent. The seam has an average thickness of 3 ft. 6 in., which is significant of the conditions obtaining in Nova Scotia that are forcing the development of the thinner seams.

In the "A" Jubilee seam, the Scotia Company has for some time been using a storage-battery electric locomotive for haulage purposes, with excellent results, so it is said. So far as the writer knows this is the only storage-battery locomotive in use in a Nova Scotia coal mine, and it points in the direction of the extended use of electricity in underground operations. Electric power in some form offers the only known motive power by which the development of the submarine coal areas off Cape Breton Island can be carried out. Steam and compressed air have limits of transmission that are too small to allow of their use in undersea workings to the extent that these workings are likely to reach in the future.

**Dominion Coal Company:**

The transformer house and three transformers at No. 7 Colliery were recently destroyed by fire.

The collieries in the Glace Bay district were idle on the 17th September for a local peace celebration. In publishing its decision to enforce a 24-hours' strike in the local collieries on this date in protest against the refusal of bail to the Winnipeg strike leaders, the U.M.W. leaders did not mention that it had previously been arranged that this date was to be observed as a general holiday.

The publishing of inaccurate rumors as to impending changes in officials at the headquarters of the Dominion Coal Company, has lately assumed annoying frequency. The possibility of obtaining accurate information by enquiry from those who are in a position to know, and the personal annoyance and even worse things that follow these irresponsible rumors, do not seem to occur to those who originate these rumors. The rule appears to be, publish the rumor first and the contradiction afterwards. Unfortunately, a thoughtlessly published newspaper rumor may damage or destroy a reputation gained by long years of endeavor.

A reflex of the slackness in the steel trade is seen in a recent report from Glace Bay that slack coal is being banked out at the No. 2 Colliery of the Dominion Coal Company. Owing to the practical stoppage of coke manufacture at Sydney—only sufficient coke is being made to keep the ovens heated—an outlet for some

3,000 tons of slack coal per day is temporarily closed. The genesis of the Dominion Steel Company was in the necessity for an outlet for slack coal, which formerly had been sold to New England gas companies at unremunerative prices, and the cessation of coke manufacture in Sydney has caused a recurrence of the old problem.

The Dominion Coal Company possesses a very fine coal-washery which was designed to wash slack coal for the Montreal market. A very saleable product was delivered from this washery before the war, but the plant has not been put to the extensive use that was contemplated when it was erected because of the demand for coal during the war, and the large amount of slack coal required for coking purposes, which on occasions even required coal to be crushed to slack to make up the shortage in the screened slack coal.

If the Dominion Company can find transportation for the washed slack, it will probably decide to commence washing slack coal for the Montreal market as was originally intended.

It is an interesting coincidence that an exactly similar reversal of slack demand was during the past week reported from Sydney, Australia, where owing to the stoppage of steel manufacture, a surplus of slack coal is accumulating.

**The Late George Gray of Stellarton, N.S.**

With much regret we learn of the death of Mr. George Gray of Stellarton. Mr. Gray was the doyen of the Nova Scotia coal trade. His connection with the Acadia Coal Company commenced in 1883 as a clerk in the office, from which position he rose to be the assistant general manager.

Mr. Gray's abilities as an executive and his understanding of labor difficulties were well known, and few men had such an all-round knowledge of the daily round of the operation of coal mines and the business of selling coal.

Mr. Gray took a keen interest in the duties of a citizen, and was prominent in all works of relief and mercy. As a citizen, and as an adviser in the difficult times through which the coal industry is passing, Mr. Gray's loss will be much felt. He had worked hard all his life and was looking forward to some well-earned leisure when he was attacked by a hopeless malady. Mr. Gray's death removes an outstanding figure in the Nova Scotian coal industry, and he can be ill spared.

**Inverness District.**

The management of the Inverness Colliery, which is being operated under conditions of unusual difficulty, have asked the workmen to consent to a reduction in wages, but so far the men have not consented to this suggestion. It is stated that the mine now employs 673 men, of which 390 are producers. The production per man employed is less than a ton per day. The Inverness Colliery, unfortunately has reached a point in its development when it can only be operated under conditions of high selling price for coal. It is the only operating colliery now left in Inverness county, except a small enterprise at Port Hood, and it is to be feared that production in Inverness will still further decline. The only hope for Inverness county to remain a factor in the coal trade consists in the possibility that some day a strong company, with adequate capital, may con-

solidate under one ownership all the coal properties in the county.

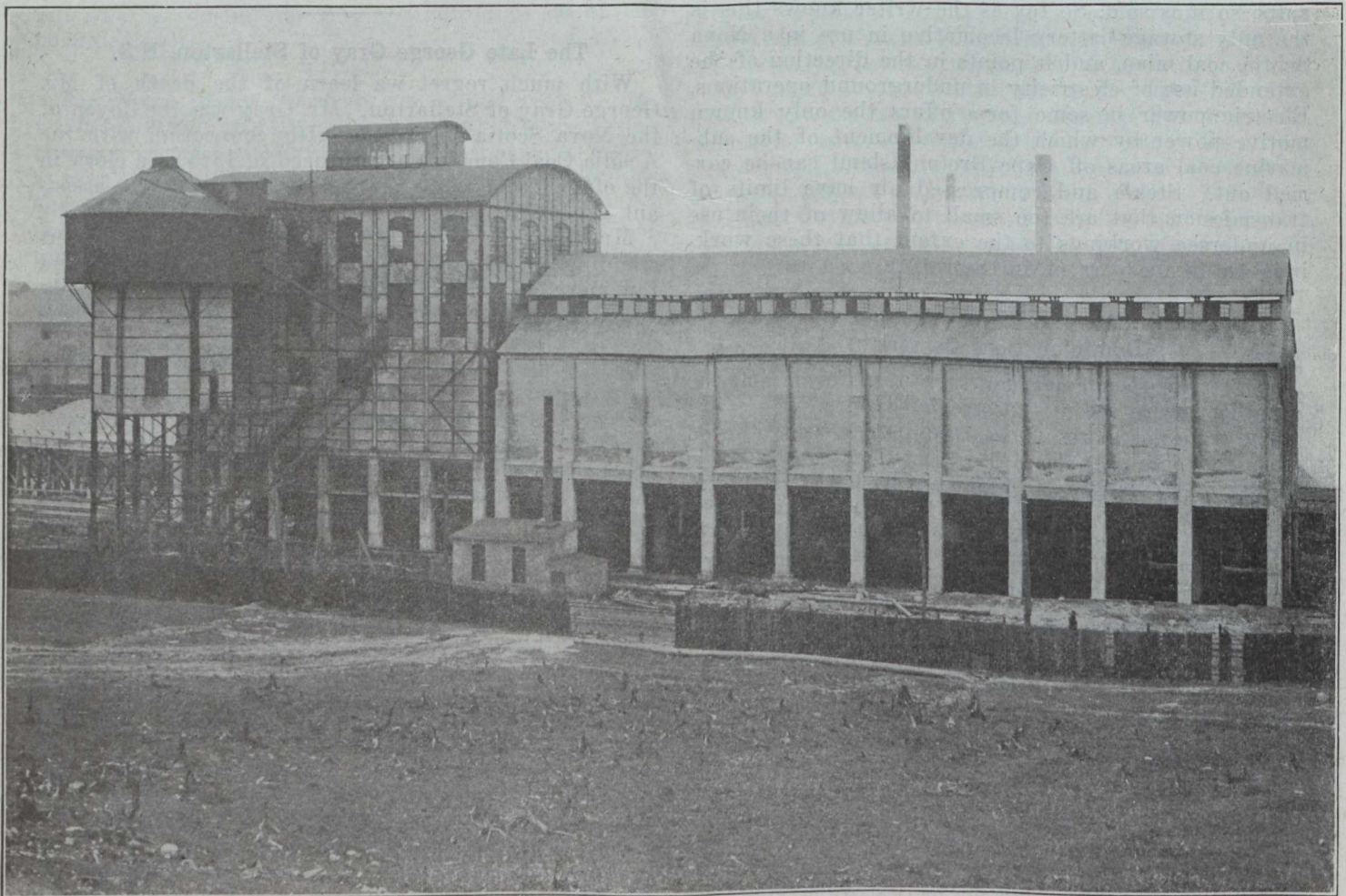
J. Allan MacDonald, manager of No. 10 Colliery of the Dominion Coal Company, was accidentally shot on a hunting trip and died as a result of his wounds. Mr. MacDonald had been in the service of the Dominion Coal Company all his life, having come to the Glace Bay district from Springhill Mines as a boy. He had risen by merit to be manager of the colliery where he was for a number of years the underground manager, and his death, by accident, deprives the Dominion Coal Company of a valuable official in the prime of life.

#### Minto, N.B.

A Board of Conciliation has been granted to consider the demands of the workmen at the Minto Mines. Local mining is being conducted under the limited conditions that the limited nature of the coal occurrences permits, and some of the requests of the miners, such as for check-weigh men, may require to be conditioned by the relative smallness of the industry in this neighborhood. This point does not seem to be quite realized.

#### Newfoundland.

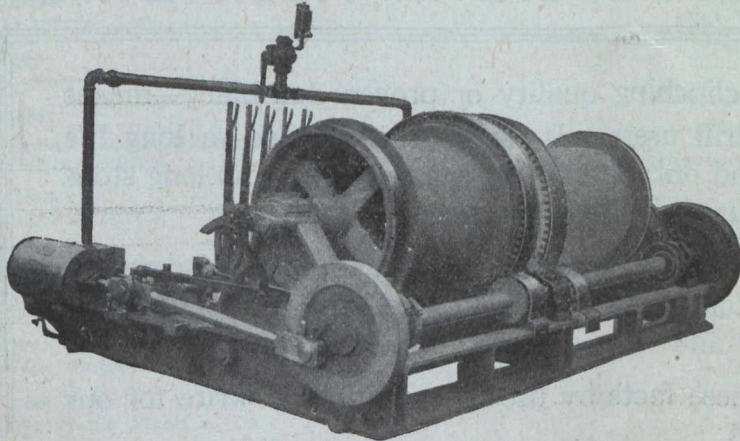
Encouraging reports of development in the St. George's Coal Fields' properties are heard. Exposures of the Jukes' seam on the Barachois River are said to have revealed up to 11 feet thickness of coal, but these reports must be accepted with reserve, as the coal occurrences in this neighborhood consist of seams highly inclined, and the measurements may not have been taken at right angles to the roof measures. The "Journal" is endeavoring to obtain accurate information on this interesting coal deposit. The lack of coal in Newfoundland is one of that colony's economic drawbacks, and any important coal occurrence there would have great meaning for the newly created Dominion of Newfoundland. Again the occurrence of coal on the other side of the Cabot Straits is quite evidently a continuance of the ancient coalfield which underlies portions of Nova Scotia and New Brunswick, and has an unknown extension under the Gulf and the Cabot Straits, and for this second reason much geological interest attaches to coal occurrences in Newfoundland.



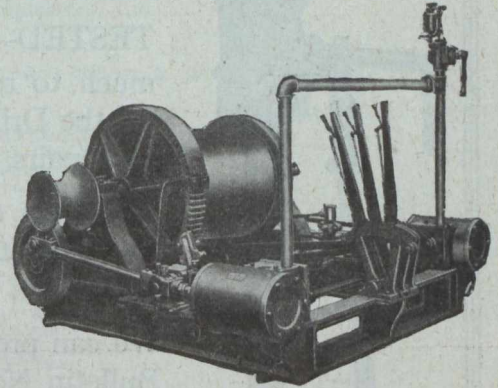
Dominion Coal Company's Baum Coal Washer at Sydney, shows Washer and Storage Hoppers for washed slack.

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## Vancouver Starts Plans for the Western Meeting of the Canadian Mining Institute.

With Dr. E. T. Hodge as organizer of the General Western meeting of the Canadian Mining Institute, to be held in Vancouver, Nov. 26 to 28, all members of the Institute may rest assured that they will have one great big time in the Western centre of Canadian mining.

Plans are being made which will insure the success of this meeting from every point of view. Readers of the Mining Journal will find something in the way of plans for this meeting in every weeks issue from now on. We want every member to read it and come on out and see our great big West if you have not already seen it. Those that have come again and renew old acquaintances, and see what we are doing out here in this great live country.

An endeavor is being made to raise additional finances preparatory to resuming work in due course on the property of the Baldwin Gold Mines, at Kenogami station, a few miles north from Swastika.

Before the labor strike caused curtailment of operations a shaft was driven to a depth of 215 feet on the Baldwin, and about 175 feet of cross-cutting was done, during the course of which considerable encouragement was met with. The property is equipped with a steam driven mining plant.

## Mr. Charles Camsell of Dominion Geological Survey Returns From Kettle Valley District.

On Sept. 2 Mr. Charles Camsell of the Dominion Geological Survey arrived in Vancouver after a two weeks trip during which he surveyed gold deposits

along the Kettle Valley Railway line. He reports many rich gold quartz veins. The "Emancipation" mine is the only lode working along the line and though it contains high grade ore, operations are carried on in a small way. The cost of labor and equipment has advanced considerably during the last few years and the price of gold has remained stationary, making it impossible to operate gold mines at a profit unless they are very high grade.

By placer methods of mining prospectors have discovered these same veins running across Siwash Creek and the Fraser River about Yale. By a slow process of denudation these veins have supplied much of the gold that has been taken from these streams. Estimates place the value of that taken from Siwash Creek at \$3,000,000. Very little placer mining is carried on in this district now.

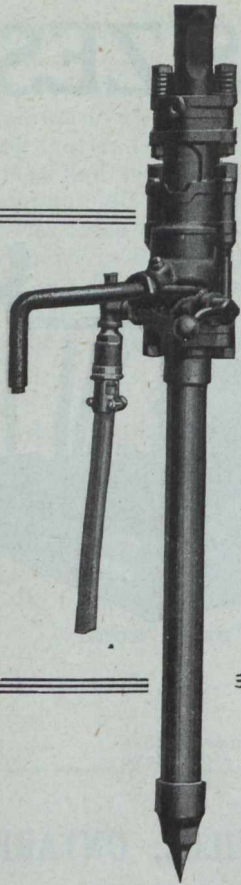
## PERSONALS.

Mr. J. P. Gordon has returned to The Pas after a visit to Toronto.

Mr. Evered and Mr. Moodie of the Davidson Gold Mines are visiting the Herrick gold property, Wasapika area.

Mr. R. E. Hore has returned to Toronto after examining properties in the Wasapika area. He looked over a group of claims there and has directed attention to an area where the geological conditions are favorable for gold deposits.

Dr. W. G. Miller, Provincial Geologist of Ontario, who is at present in London as Canada's representative of the Imperial Mineral Resources' Bureau, expects to return to Toronto in October.



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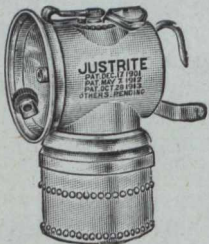
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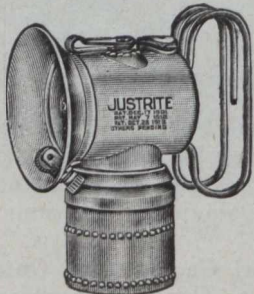
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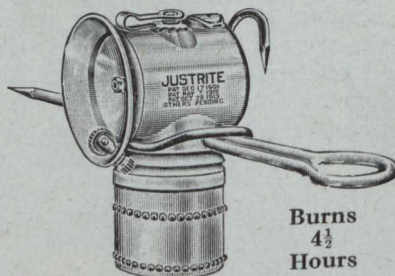
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No. 101—26 Gauge Brass  
No. 103—22 Gauge Brass (Extra Heavy)

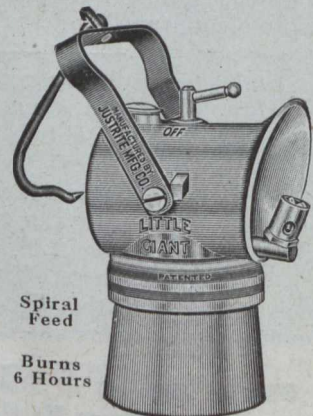
The hearty recommendation of Justrite users speaks for their perfection and ease of operation. Best of all is their economy. The name “Justrite” expresses its cost of operating as well as the quality of light furnished. It includes the great saving over the cost of candles—about one-half to be exact. Certainly this saving is worth every operator's consideration from the standpoint of economy. Scores of the largest mines in this and foreign countries use “Justrite” lamps EXCLUSIVELY. Whatever the conditions are, there is a “Justrite” made for every mining purpose.

**Justrite Manufacturing Co.**  
Dept C. Chicago, U. S. A.

## CARBIDE MINE LAMPS

A few of our many models. We make a suitable lamp for every mining purpose. Catalog on request.

“LITTLE GIANT”  
Seamless Aluminum



Spiral  
Feed

Burns  
6 Hours

No. 110

# The Canadian Miners' Buying Directory.

**Acetylene Gas:**

Canada Carbide Company, Ltd.  
Canadian Fairbanks-Morse.

**A.C. Units:**

MacGovern & Co.

**Agitators:**

The Dorr Co.

**Air Hoists:**

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

**Alternators:**

MacGovern & Co.

**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.

**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.  
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.

**Ball Mill Linings:**

Hardinge Conical Mill Co.

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

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

**Belting:**

R. T. Gilman & Co.

**Belting (Transmission):**

Goodyear Tire & Rubber Co.

**Belting (Elevator):**

Goodyear Tire & Rubber Co.

**Belting (Conveyor):**

Goodyear Tire & Rubber Co.

**Blasting Batteries and Supplies:**

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

**Bluestone:**

The Consolidated Mining & Smelting Co.

**Blowers:**

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

**Boilers:**

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

**Blue Vitriol (Coniagas Red):**

Canadian Fairbanks-Morse Co., Ltd.

**Bortz and Carbons:**

Diamond Drill Carbon Co.

**Boxes, Cable Junction:**

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

**Brazilian Rough Diamonds:**

Diamond Drill Carbon Co.

**Brazilian Mica:**

Diamond Drill Carbon Co.

**Buggies, Mine Car (Steel)**

Hendrick Manufacturing Co.

**Brazilian Ballas:**

Diamond Drill Carbon Co.

**Brazilian Rock Crystal:**

Diamond Drill Carbon Co.

**Brazilian Tourmalines:**

Diamond Drill Carbon Co.

**Brazilian Aquamarines:**

Diamond Drill Carbon Co.

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

Hendrick Manufacturing Co.

**Buckets:**

Canadian Ingersoll-Rand Co., Ltd.  
The Electric Steel & Metals Co.  
R. T. Gilman & Co.  
Hendrick Manufacturing Co.  
Link-Belt Co.  
M. Beatty & Sons, Ltd.  
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:**

M. Beatty & Sons, Ltd.  
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.  
Mussens, Ltd.  
The Wabi Iron Works

# CANADA

## DEPARTMENT OF MINES

HON. MARTIN BURRELL, *Minister*

R. G. McCONNELL, *Deputy Minister*

### MINES BRANCH

#### Recent Publications

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

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

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

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

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

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

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

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

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

Summary Report of the Mines Branch, 1917.

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

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

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

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

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

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

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

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

### GEOLOGICAL SURVEY

#### Recent Publications

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

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

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

Memoir 107. Road materials in the vicinity of Regina, Saskatchewan, by L. Reinecke.

Memoir 108. The Mackenzie River basin, by Charles Cammell and Wyatt Malcolm.

Memoir 109. The Harricanaw-Turgeon basin, northern Quebec, by T. L. Tanton.

Memoir 110. Preliminary report on the economic geology of Hazelton district, British Columbia, by J. J. O'Neill.

Memoir 112. Geology of the district belt of southwestern Alberta, by J. S. Stewart.

Map 42A. Duncan sheet, Vancouver Island. Geology.

Map 44A. Sooke sheet, Vancouver Island. Geology.

Map 115A. Sheep river, Alberta. Topography.

Map 164A. St. John, New Brunswick. Topography.

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

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

Map 1585. Mackenzie River basin. Geology.

Map 1680. Portions of Grenville, Harrington, Chatham and Wentworth townships, Argenteuil county, Quebec. Geology.

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

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

Map 1702. Klotassin, Yukon Territory. Geology.

Map 1708. Bridge river, Lillooet district, B.C. Topography.

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

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

Map 1714. The Niagara peninsula, Ontario. Geology.

Map 1715. The Ontario peninsula. Geology.

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

The Geological Survey will, under certain limitations, give information and advice upon subjects relating to general and economic geology. Mineral and rock specimens, when accompanied by definite statements of localities, will be examined and their nature reported upon.

Communications should be addressed to The Director, Geological Survey, Ottawa.

## 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.  
R. T. Gilman & Co.

**Cam Shafts:**

Canada Foundries & Forgings, Ltd.

**Car Dumps:**

Sullivan Machinery Co.  
R. T. Gilman & Co.  
Canadian Fairbanks-Morse Co., Ltd.

**Carbide of Calcium:**

Canada Carbide Company, Ltd.

**Cars:**

Canadian Foundries and Forgings, Ltd.  
Canadian Ingersoll-Rand Co., Ltd.  
Canadian Fairbanks-Morse Co., Ltd.  
MacKinnon Steel Co., Ltd.  
The Electric Steel & Metals Co.  
Northern Canada Supply Co.  
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  
Marsh Engineering Works, Ltd.  
The Electric Steel & Metals Co.  
The Wabi Iron Works

**Carriers (Gravity):**

Jones & Glassco

**Castings (Iron and Steel)**

Burnett & Crampton  
Canadian Steel Foundries, Ltd.  
The Electric Steel & Metals Co.  
The Wabi Iron Works

**Cement Machinery:**

Northern Canada Supply Co.  
Hadfields, Limited  
Fraser & Chalmers of Canada, Ltd.  
Canadian Fairbanks-Morse Co., Ltd.  
The Electric Steel & Metals Co.  
R. T. Gilman & Co.  
Burnett & Crampton

**Chains:**

Jones & Glassco  
Northern Canada Supply Co.  
Canadian Fairbanks-Morse Co., Ltd.  
Link-Belt Co.  
Greening, B., Wire Co., Ltd.

**Chain Drives:**

Jones & Glassco

**Chemical Apparatus:**

Mine and Smelter Supply Co.

**Chemists:**

Canadian Laboratories  
Campbell & Deyell  
Thos. Heyes & Sons  
Milton Hersey Co.  
Ledoux & Co.  
Constant, C. L. Company

**Chrome Ore:**

The Electric Steel & Metals Co.  
Everett & Co.

**Classifiers:**

Mine and Smelter Supply Co.  
Mussens, Limited  
Fraser & Chalmers of Canada, Ltd.  
The Wabi Iron Works  
R. T. Gilman & Co.  
The Dorr Company

**Coal:**

Dominion Coal Co.  
Nova Scotia Steel & Coal Co.

**Coal Cutters:**

Sullivan Machinery Co.  
Canadian Ingersoll-Rand Co., Ltd.

**Coal Mining Explosives:**

Canadian Explosives, Ltd.

**Coal Mining Machinery:**

Canadian Ingersoll-Rand Co., Ltd.  
Sullivan Machinery Co.  
March Engineering Works  
Hadfields, Ltd.

Hendrick Mfg. Co.  
Fraser & Chalmers of Canada, Limited  
Mussens, Limited  
R. T. Gilman & Co.

**Coal and Coke Handling Machinery**

Link-Belt Co.

**Coal Pick Machines:**

Sullivan Machinery Co.

**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:**

Mine & Smelter Co.  
Deister Concentrator Co.  
The Wabi Iron Works

**Converters:**

Northern Canada Supply Co.  
MacGovern & Co., Inc.

**Contractors' Supplies:**

Canadian Fairbanks-Morse Co., Ltd.

**Consulters and Engineers:**

Hersey Milton Co., Ltd.

**Conveyor Flights:**

Hendrick Mfg. Co., Ltd.

**Conveyor—Trough—Belt:**

Canadian Fairbanks-Morse Co., Ltd.  
Link-Belt Co.  
Hendrick Mfg. Co.  
Mussens, Limited  
Jones & Glassco (Roller, Belt and Chain)  
Hendrick Mfg. Co.  
The Wabi Iron Works

**Conical Mills:**

Hardinge Conical Mill Co.

**Copper:**

Consolidated Mining & Smelting Co.

**Cranes:**

Canadian Fairbanks-Morse Co., Ltd.  
Link-Belt Co.  
R. T. Gilman & Co.  
Smart-Turner Machine Co.  
M. Beatty & Sons, Ltd.

**Crane Ropes:**

Allan Whyte & Co.  
Greening, B., Wire Co., Ltd.

**Crucibles:**

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

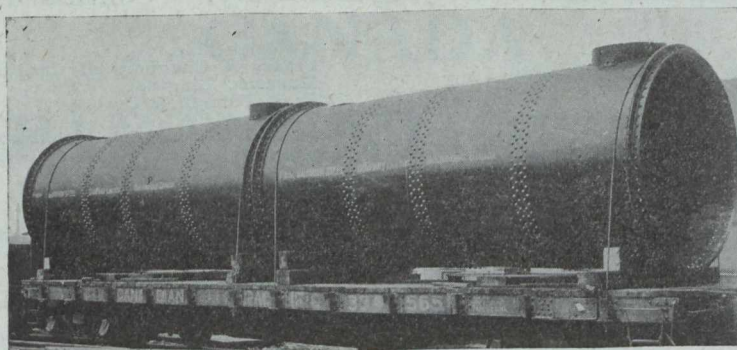
**Crusher Balls:**

Canada Foundries & Forgings, Ltd.

**Crushers:**

Canadian Fairbanks-Morse Co., Ltd.  
Canadian Steel Foundries, Ltd.  
Hardinge Conical Mill Co.  
The Electric Steel & Metals Co., Ltd.  
R. T. Gilman & Co.  
Lyman, Ltd.  
Mussens, Limited  
Mine and Smelter Supply Co.  
Hadfields, Limited  
Fraser & Chalmers of Canada, Ltd.  
The Wabi Iron Works

Structural  
Steel  
and  
Steel  
Plate  
Work



Furnace Sheets  
Buildings  
Air Receivers  
Aftercoolers  
Tanks  
Skips

MacKINNON STEEL CO. Limited, SHERBROOKE, Que.

MONTREAL OFFICE:  
404 New Birks Building

THE BEST BY TEST

# SISCO Drill and Tool Steel

FOR SALE BY

**Northern Canada Supply  
Co. Limited**

COBALT, HAILEBURY, SOUTH  
PORCUPINE, TIMMINS

5

# Sure

To Open  
To Close  
To Protect  
and  
To Save Life

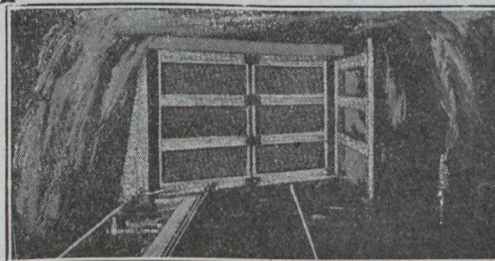
When you realize that the

## Canton Automatic Mine Door

will actually do these things, you'll begin to realize that you are more than paying for the cost of it in the wages you pay your trapper boys.

Moreover, in addition to saving the wages of the boy, it gives you control of air currents, absolute and complete; and that factor alone should make it worth your while to install.

Catalog contains full description.



Canadian  
Manufacturers

**G. C.  
Hall & Co.**

CALGARY  
ALTA.

## The Consolidated Mining and Smelting Company

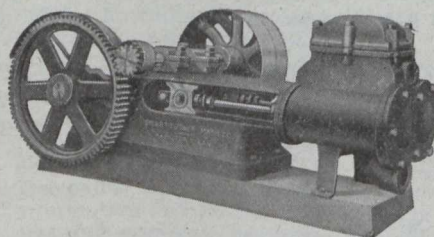
OF CANADA, LIMITED

Smelting and Refining : TRAIL, BRITISH COLUMBIA

Buyers of  
GOLD, SILVER, COPPER, LEAD and ZINC ORES

Producers and Sellers of  
Copper - Lead - Zinc  
Tadanac Brand

Sales Offices : - - C. P. R. Building, Toronto



FOR  
PUMPS

that give

**BETTER SERVICE**

**LONGER SERVICE**

TRY—

**The Smart-Turner Machine Co., Limited**

HAMILTON,

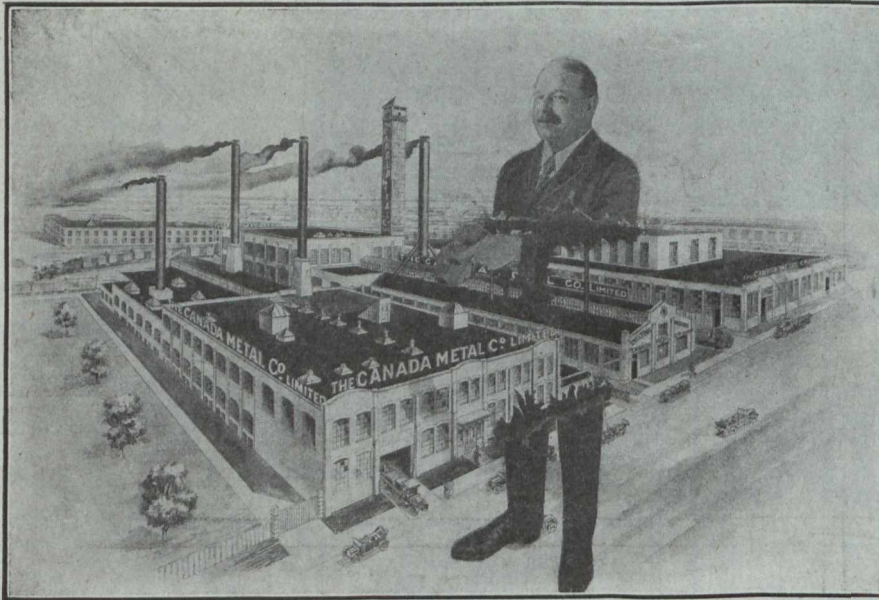
CANADA.



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

- Cyanide Plant Equipment:**  
The Dorr Co.
- D. C. Units:**  
MacGovern Co.
- Derricks:**  
Smart-Turner Machine Co.  
M. Beatty & Sons, Ltd.  
Marsh Engineering Works  
R. T. Gilman & Co.  
Canadian Fairbanks-Morse Co., Ltd.  
Mussens, Limited
- Diamond Drill Contractors:**  
Diamond Drill Contracting Co.  
E. J. Longyear Company  
Smith & Travers  
Sullivan Machinery Co.
- Diamond Tools:**  
Diamond Drill Carbon Co.
- Diamond Importers:**  
Diamond Drill Carbon Co.
- Digesters:**  
Canadian Chicago Bridge and Iron Works
- Dies:**  
Canada Foundries & Forgings, Ltd.
- Dredger Pins:**  
Canadian Steel Foundries, Ltd.  
The Electric Steel & Metals Co.  
Hadfields, Limited
- Dredging Machinery:**  
Canadian Steel Foundries, Ltd.  
M. Beatty & Sons  
Hadfields, Limited  
R. T. Gilman & Co.
- Dredging Ropes:**  
Allan, Whyte & Co.  
Greening, B., Wire Co., Ltd.  
R. T. Gilman & Co.
- Drills, Air and Hammer:**  
Canadian Ingersoll-Rand Co., Ltd.  
Sullivan Machinery Co.  
Northern Canada Supply Co.  
Canadian Rock Drill Co.  
The Mine & Smelter Supply Co.  
Mussens, Limited
- Drills—Core:**  
Canadian Ingersoll-Rand Co., Ltd.  
E. J. Longyear Company  
Standard Diamond Drill Co.  
Sullivan Machinery Co.
- Drills—Diamond:**  
Sullivan Machinery Co.  
Northern Canada Supply Co.  
E. J. Longyear Company
- Drill Steel—Mining:**  
Hadfields, Limited  
Mussens, Limited
- Drill Steel Sharpeners:**  
Canadian Ingersoll-Rand Co., Ltd.  
Northern Canada Supply Co.  
Sullivan Machinery Co.  
Canadian Rock Drill Co.  
The Wabi Iron Works
- Drills—Electric:**  
Canadian Fairbanks-Morse Co., Ltd.  
Sullivan Machinery Co.  
Northern Electric Co., Ltd.
- Drills—High Speed and Carbon:**  
Canadian Fairbanks-Morse Co., Ltd.  
Hadfields, Limited
- Dynamite:**  
Canadian Explosives  
Northern Canada Supply Co.
- Dynamos:**  
Canadian Fairbanks-Morse Co., Ltd.  
MacGovern & Company
- Ejectors:**  
Canadian Fairbanks-Morse Co. Ltd.  
Canadian Ingersoll-Rand Co., Ltd.  
Northern Canada Supply Co.
- Elevators:**  
M. Beatty & Sons  
Sullivan Machinery Co.  
Northern Canada Supply Co.  
Hadfields, Limited  
Fraser & Chalmers of Canada, Ltd.  
Mussens, Limited  
The Wabi Iron Works
- Engineering Instruments:**  
C. L. Berger & Sons
- Engines—Automatic:**  
Canadian Fairbanks-Morse Co., Ltd.  
Fraser & Chalmers of Canada, Ltd.
- Engines—Gas and Gasoline:**  
Canadian Fairbanks-Morse Co., Ltd.  
Alex. Fleck  
Fraser & Chalmers of Canada, Ltd.  
Sullivan Machinery Co.  
Gould, Shapley & Muir Co., Ltd.  
MacGovern & Co., Inc.  
The Mine & Smelter Supply Co.
- Engines—Haulage:**  
Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.  
Marsh Engineering Works  
Fraser & Chalmers of Canada, Ltd.
- Engines—Marine:**  
Canadian Fairbanks-Morse Co., Ltd.  
MacGovern & Co., Inc.
- Engines—Steam:**  
Canadian Fairbanks-Morse Co., Ltd.  
M. Beatty & Sons  
R. T. Gilman & Co.  
MacGovern & Co., Inc.  
Fraser & Chalmers of Canada, Ltd.
- Engineers:**  
The Dorr Co.
- Ferro-Alloys (all Classes):**  
Everitt & Co.
- Feed Water Heaters:**  
MacGovern & Co.
- Flood Lamps:**  
Northern Electric Co., Ltd.
- Flourspar:**  
The Consolidated Mining & Smelting Co.  
Everitt & Co.
- Forges:**  
Canadian Fairbanks-Morse Co., Ltd.  
Northern Canada Supply Co.
- Forging:**  
M. Beatty & Sons  
Canadian Foundries and Forgings, Ltd.  
Smart-Turner Machine Co.  
Hadfields, Limited  
Fraser & Chalmers of Canada, Ltd.
- Frogs:**  
Canadian Steel Foundries, Ltd.
- Frequency Changers:**  
MacGovern & Co., Inc.
- Furnaces—Assay:**  
Canadian Fairbanks-Morse Co., Ltd.  
Lymans, Limited  
Mine & Smelter Supply Co.
- Fuse:**  
Canadian Explosives  
Northern Canada Supply Co.
- Gears (Cast):**  
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.

*It is a great responsibility to recommend a BEARING METAL where human life depends upon it.*



*W. G. Harris*

President.

Tell us of your difficult Bearing Problems. We can help you.

**Imperial Genuine Bearing Metal**

For High Speed, heavy Engine bearings.

**Harris Heavy Pressure**

For General Machine bearings.

**Aluminoid Bearing Metal**

For Light countershaft work.

**THE CANADA METAL COMPANY LIMITED**

TORONTO

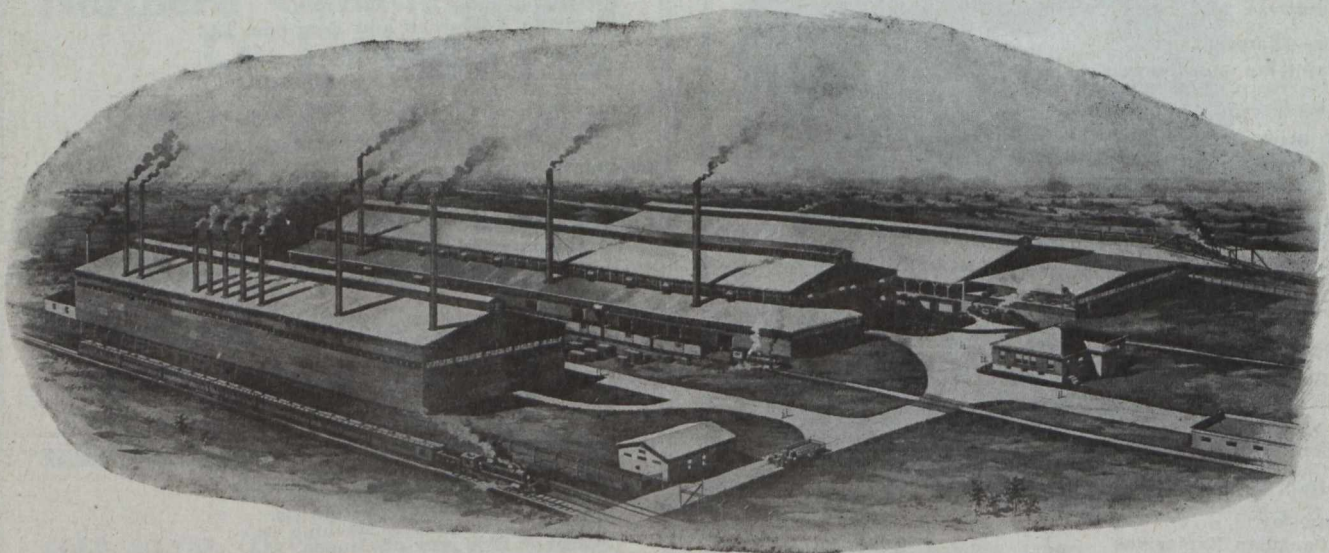
MONTREAL

WINNIPEG

VANCOUVER

**BULLDOG**

HOLLOW and SOLID  
**Mining & Rock Drill Steel**



WORKS: ROCKAWAY, NEW JERSEY, U.S.A.

**INTERNATIONAL HIGH SPEED STEEL CO.**

Agents: Eastern Canada, H. L. Osborne, Toronto.

British Columbia, E. G. Prior & Co., Victoria, B.C.

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

- Gold Trays:**  
Canada Chicago Bridge & Iron Works
- Hose (Air Drill):**  
Goodyear Tire & Rubber Co.
- Hose (Fire):**  
Goodyear Tire & Rubber Co.
- Hose (Packings)**  
Goodyear Tire & Rubber Co.
- Hose (Suction):**  
Goodyear Tire & Rubber Co.
- Hose (Steam):**  
Goodyear Tire & Rubber Co.
- Hose (Water):**  
Goodyear Tire & Rubber Co.
- Hammer Rock Drills:**  
Mussens, Limited  
The Mine & Smelter Supply Co.
- Hangers and Cable:**  
Standard Underground Cable Co. of Canada, Ltd.
- High Speed Steel:**  
Canadian Fairbanks-Morse Co. Ltd.  
Hadfields, Limited
- High Speed Steel Twist Drills:**  
Canadian Fairbanks-Morse Co., Ltd.  
Northern Canada Supply Co.
- Hoists—Air, Electric and Steam:**  
Canadian Ingersoll-Rand Co., Ltd.  
Canadian Fairbanks-Morse Co., Ltd.  
Jones & Glassco  
M. Beatty & Sons  
Marsh Engineering Works  
Northern Canada Supply Co.  
Mine & Smelter Supply Co.  
Fraser & Chalmers of Canada, Ltd.  
The Electric Steel & Metals Co.  
The Wabi Iron Works  
R. T. Gilman & Co.  
Mussens, Limited  
Link-Belt Co.
- Hoisting Engines:**  
Canadian Fairbanks-Morse Co., Ltd.  
The Electric Steel & Metals Co.  
Mussens, Limited  
Sullivan Machinery Co.  
Canadian Ingersoll-Rand Co., Ltd.  
M. Beatty & Sons  
Marsh Engineering Works  
Fraser & Chalmers of Canada, Ltd.  
The Mine & Smelter Supply Co.
- Hose:**  
Canadian Fairbanks-Morse Co., Ltd.  
Northern Canada Supply Co.
- Hydraulic Machinery:**  
Canadian Fairbanks-Morse Co., Ltd.  
Hadfields, Limited  
MacGovern & Co., Inc.  
Fraser & Chalmers of Canada, Ltd.  
The Wabi Iron Works
- Industrial Chemists:**  
Hersey, M. & Co., Ltd.
- Ingot Copper:**  
Canada Metal Co., Ltd.  
Hoyt Metal Co.
- Insulating Compounds:**  
Standard Underground Cable Co. of Canada, Ltd.
- Inspection and Testing:**  
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- Lamps—Acetylene:**  
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- Levels:**  
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Everitt & Co.
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The Dorr Co.
- Metallurgical Machinery:**  
The Dorr Co.
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Diamond Drill Carbon Co.
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Fraser & Chalmers of Canada, Ltd.  
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The Wabi Iron Works
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Oxford Copper Co.  
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Everitt & Co.  
Pennsylvania Smelting Co.**Packing:**

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Greening, B., Wire Co.**Pig Tin:**Canada Metal Co., Ltd.  
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Hoyt Metal Co.  
Pennsylvania Manufacturing Co.**Pipes:**Canadian Fairbanks-Morse Co., Ltd.  
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Consolidated M. & S. Co.  
Northern Canada Supply Co.  
R. T. Gilman & Co.**Pipe Fittings:**

Canadian Fairbanks-Morse Co., Ltd.

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

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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.  
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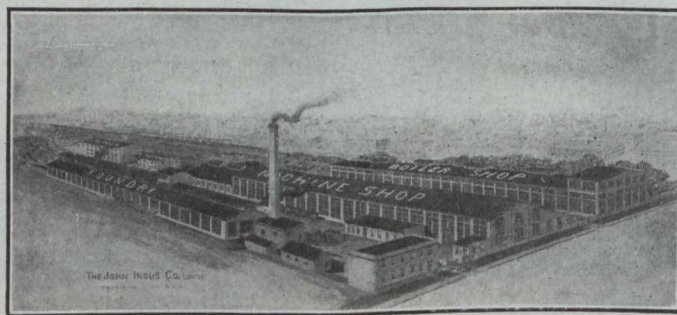
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Marsh Engineering Works  
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Fraser & Chalmers of Canada, Ltd.  
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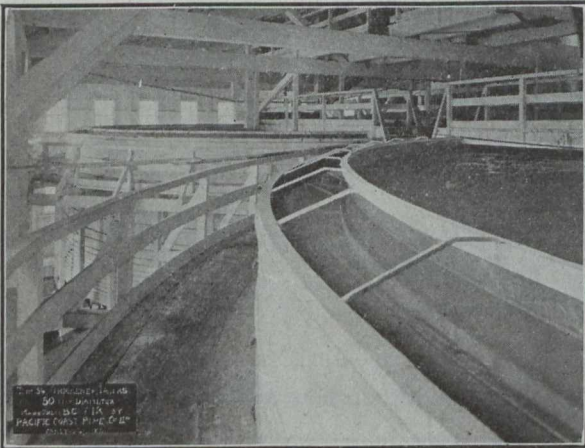
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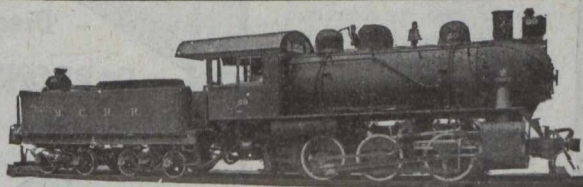
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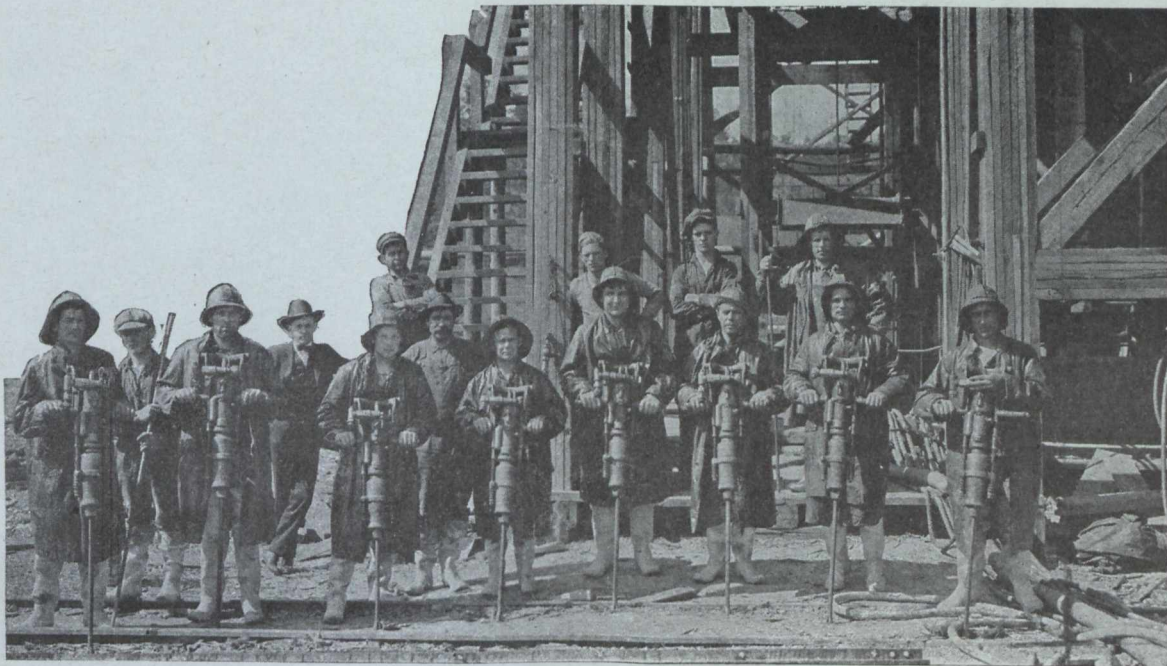
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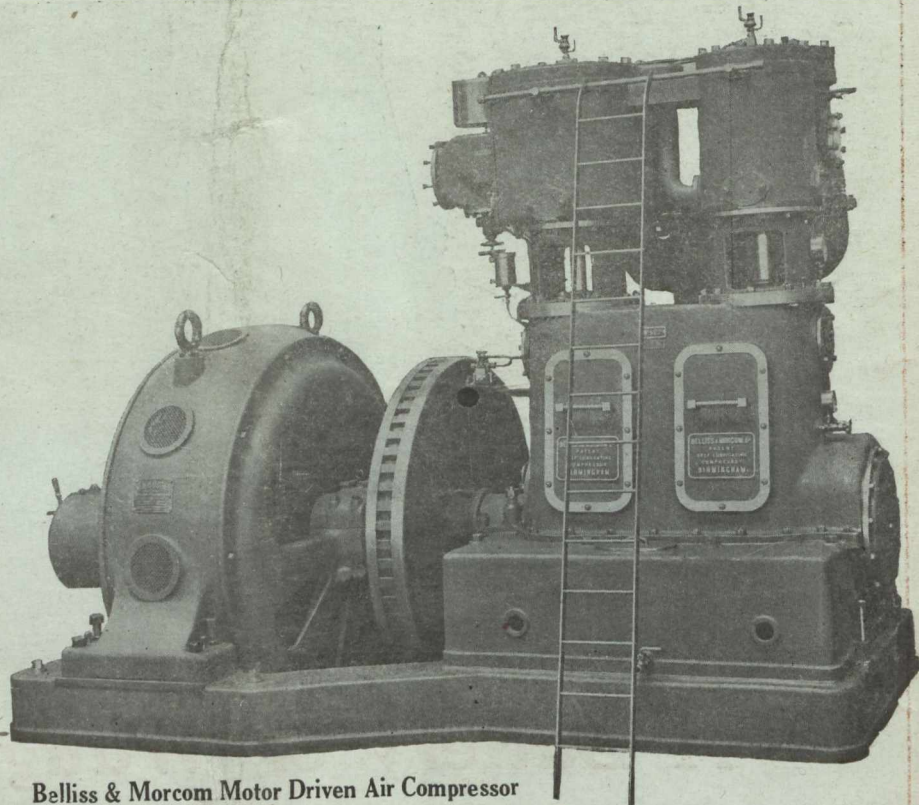
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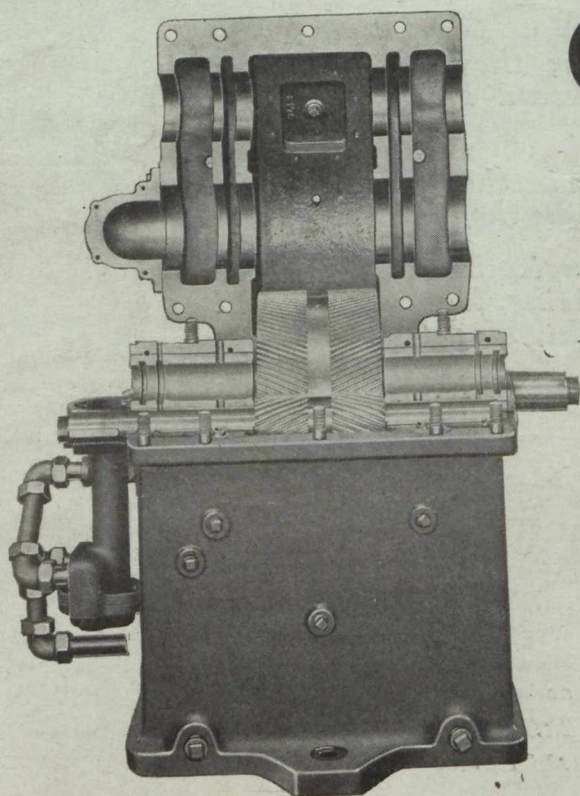
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