

CANADIAN MINING JOURNAL

VOL. XL.

February 5th, 1919

No. 5

The keynote of Business for the next few years will be "SALES"

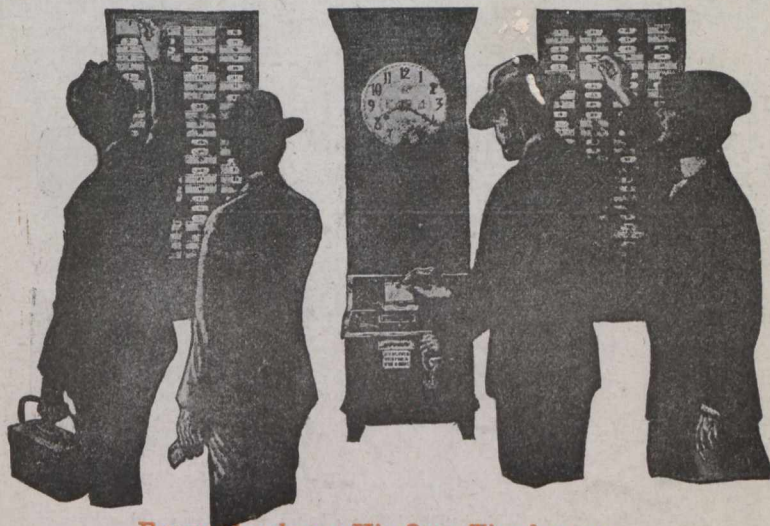
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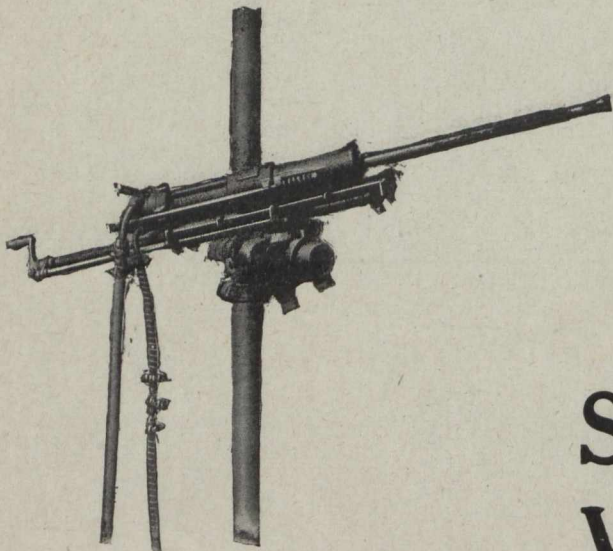
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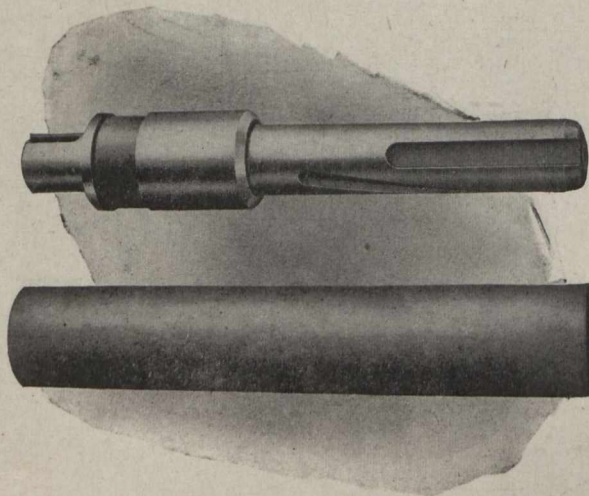
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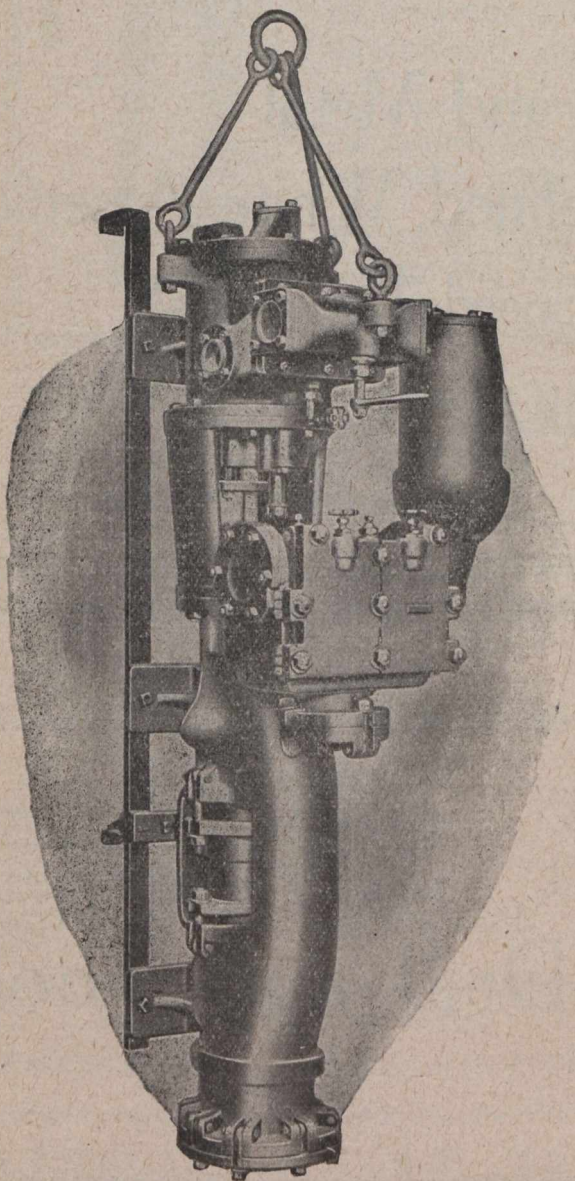
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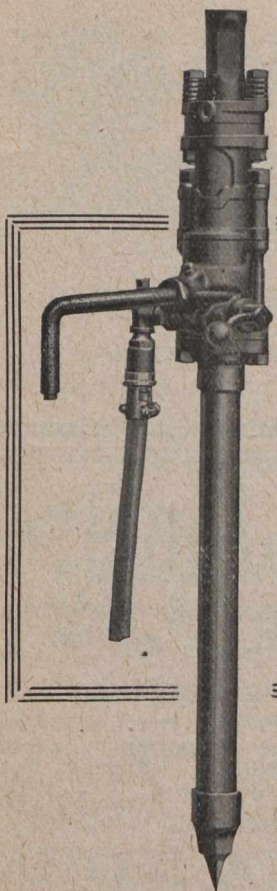
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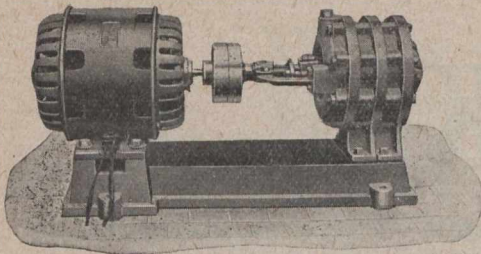


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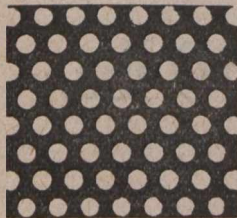
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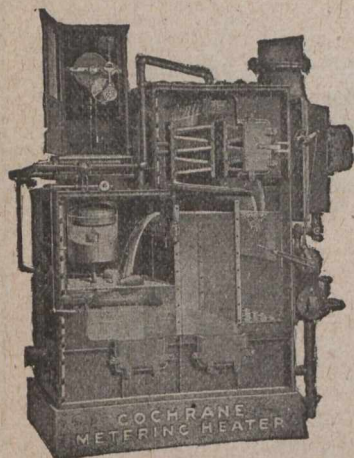
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The mineral wealth of Northern Ontario is enormous. From a few developed areas a very large output of nickel, copper, silver and gold is being made. Many promising areas are awaiting the prospector and miner.

Recently Northern Manitoba has become an important producer of copper ore, and many promising gold deposits have been located. This is an excellent field for the prospector.

One of the greatest factors in development of mineral areas is the provision of transportation facilities. Railways and the mining industry have together played a very important part in the development of several parts of Canada.

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

The Canadian Northern Railway in Manitoba gives access to the Pas Mineral Area. In Alberta the Canadian Northern is serving important coal fields.

THE DEPARTMENT OF RESOURCES CANADIAN NORTHERN RAILWAY

The Department of Resources, Canadian Northern Railway Building, Toronto, will be pleased to furnish information about the districts served.

THE FLOTATION PROCESS

MINERALS SEPARATION NORTH AMERICAN CORPORATION

Is the registered owner of the following Canadian patents: Nos. 76,621; 87,700; 94,322; 129,819; 94,516; 96,182; 96,183; 99,743; 127,397; 129,820; 134,271; 135,089; 137,404; 142,607; 147,431; 147,432; 148,275; 151,479; 151,480; 151,619; 151,810; 157,488; 157,603; 157,604; 160,692; 160,693; 160,694; 160,846; 160,847; 160,848; 160,849; 160,850; 160,937; 163,608; 163,707; 163,936; 164,587; 165,390; 166,415; 167,474; 167,475; 167,476; 167,603; 187,263.

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

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

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

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

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

Minerals Separation North American Corporation

Head Office:
61 Broadway,
New York, N. Y.

Engineering Office:
220 Battery Street,
San Francisco, California.

Canadian Attorneys.

Messrs. Ridout & Maybee, Patent Solicitors, 59 Yonge Street, Toronto, Canada.

THE FLOTATION PROCESS

MINERALS SEPARATION NORTH AMERICAN CORPORATION

NOTICE

NOTICE is hereby given that we will enforce our patents and stop all infringements, but are prepared to grant licenses for the right to use all or any of our processes to those who wish to use them. To those who infringe or have infringed our patents, notice is given that a settlement for such infringement must precede the granting of licenses for the future use of same.

Notice is further given that no one is authorized to introduce our processes or apparatus into the United States, Canada or Mexico, without direct authority from us.

All applications should be made direct to

Minerals Separation North American Corporation

Head Office:
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220 Battery Street,
San Francisco, California.

or through

Messrs. Ridout & Maybee, Patent Solicitors, 59 Yonge Street,
Toronto, Canada

If you wanted to smash rocks, would you first cushion them with water?

Would you break the force of your sledge by splashing it to the bottom of a pool a foot or two in depth?

No, you would not. You would leave those rocks exposed to the full strength of your good right arm.

Now take ore, put it in a mill and hammer it with steel balls. Why should you cushion ore with a lot of water and thus retard the striking and grinding force of the balls, *when you don't have to do it?*

In nearly all types of mills you must drown the ore in order to overflow the fines.

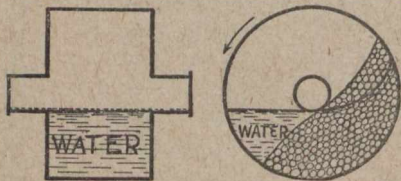
But *not* in the MARCY BALL MILL. It has a dis-

charge end (patented) which is virtually one enormous grate, or grid, from the periphery of the mill to near its centre.

So little water is needed to clear the fines through this generous grate area as fast as they are ground that the heavy steel balls go smash-bank right onto the ore.

There's no large volume of water or mass of trapped fines to hinder production on the MARCY.

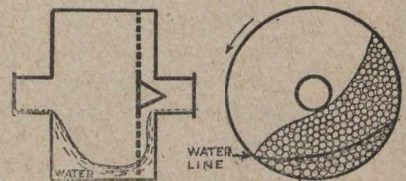
In this you see one of the reasons why the mesh ton capacity of the MARCY MILL is so enormously great, and why it is being adopted by important mining companies.



Section of ordinary wet-crushing mill in operation. Note amount of water required to overflow the fines.

MARCY BALL MILL

"One Easy Step"



Section of Marcy Mill in operation. Note low water line. Fines are rapidly ejected, thus keeping mill clear.

from coarse feed to non-selective product

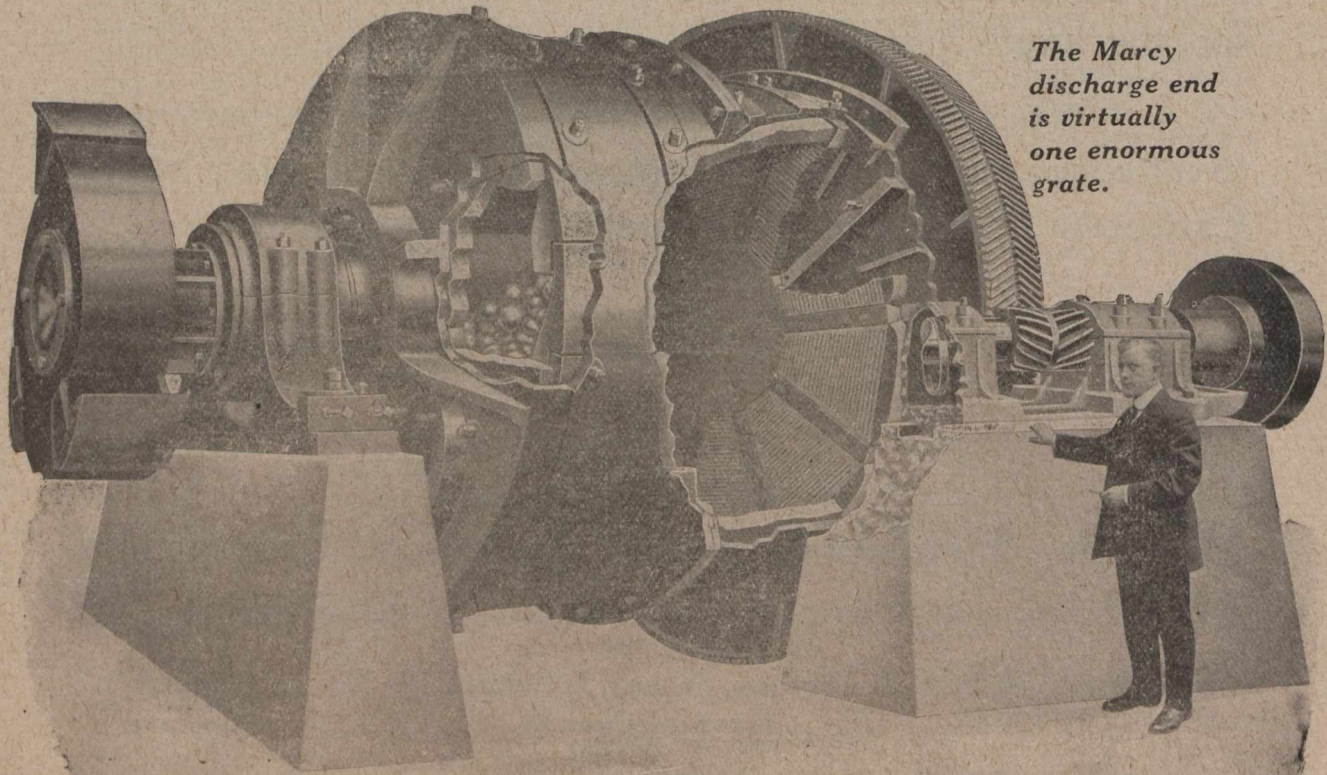
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The Marcy discharge end is virtually one enormous grate.

BRITISH COLUMBIA

The Mineral Province of Western Canada

Has produced Minerals valued as follows: Placer Gold, \$75,116,103; Lode Gold, \$93,717,974; Silver, \$43,623,761; Lead, \$39,366,144; Copper, \$130,597,620; Other Metals (Zinc, Iron, etc.), \$10,933,466; Coal and Coke, \$174,313,658; Building Stone, Brick, Cement, etc., \$27,902,381; making its Mineral Production to the end of 1917 show an

Aggregate Value of \$595,571,107

The substantial progress of the Mining Industry of this Province is strikingly exhibited in the following figures, which show the value of production for successive five-year periods: For all years to 1895, inclusive, \$94,547,241; for five years, 1896-1900, \$57,605,967; for five years, 1901-1905, \$96,509,968; for five years, 1906-1910, \$125,534,474; for five years, 1911-1915, \$142,072,603; for the year 1916, \$42,290,462; for the year 1917, \$37,010,392.

Production During last ten years, \$296,044,925

Lode-mining has only been in progress for about twenty years, and not 20 per cent. of the Province has been even prospected; 300,000 square miles of unexplored mineral bearing land are open for prospecting.

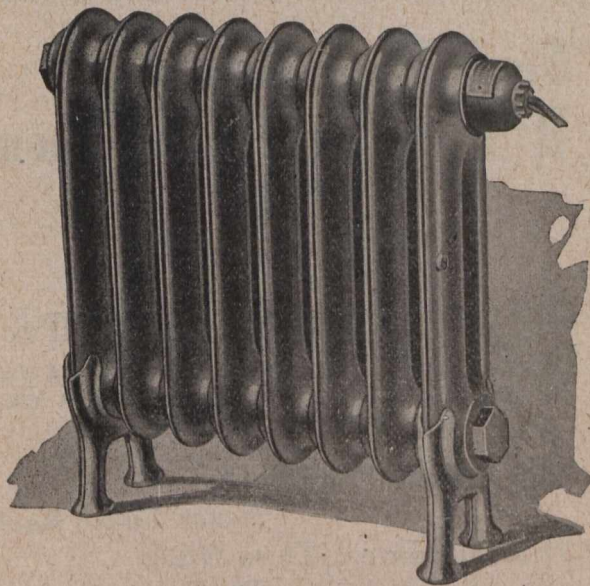
The Mining Laws of this Province are more liberal and the fees lower than those of any other Province in the Dominion, or any Colony in the British Empire.

Mineral locations are granted to discoverers for nominal fees.

Absolute Titles are obtained by developing such properties, the security of which is guaranteed by Crown Grants.

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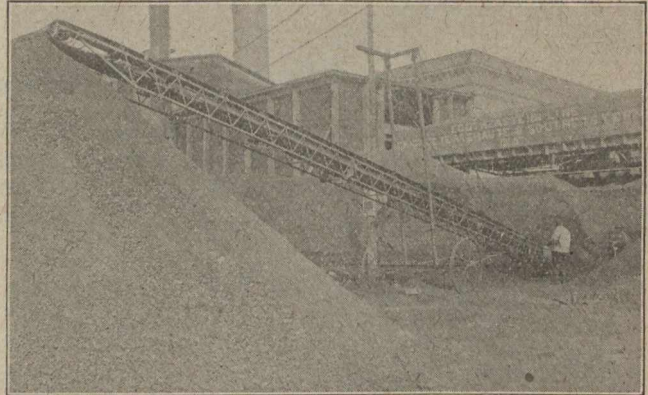
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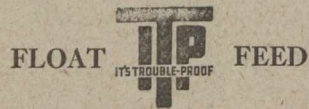
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VOL. XL.

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No. 5

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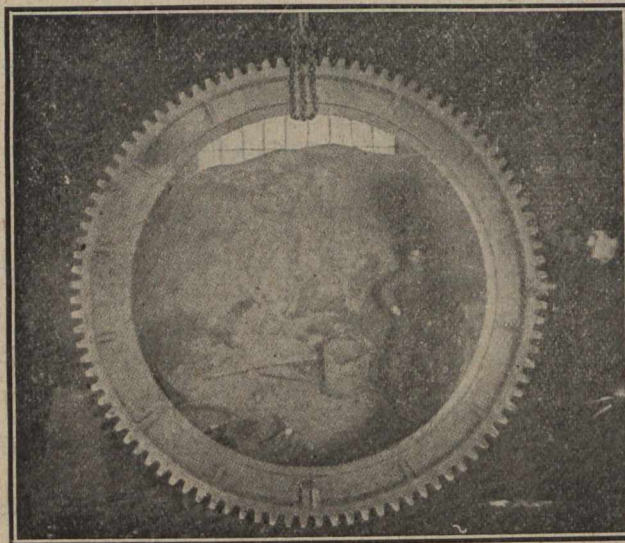
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:-: EDITORIAL :-:**MINING ENGINEERS AND WAR WORK.**

The part that mining engineers have played in the war is well indicated by an article by Mr. F. F. Sharpless in a recent number of the "Engineering and Mining Journal." Aside from the work of producing the raw materials for munitions, the mining industry has furnished men for many important duties, besides those that are purely military. Needless to say, mining engineers and miners have proven to be excellent and versatile soldiers and transportation officers. They played a big part on the battlefields in France and Belgium. Used to hardships and to overcoming difficulties promptly as they present themselves, they were not easily disconcerted. On the firing line and behind it, in tunnelling and in transportation, they helped to make the Canadian army second to none.

At home as well as at the front, mining engineers have distinguished themselves. Chief among these is Herbert C. Hoover, an American mining engineer, who was in London when war broke out. The story of those days is told by Mr. F. F. Sharpless, who writes:

Upon the declaration of war between Germany and the Allies, the chaotic situation produced among the tourist population, which we may now recall with some mirth, developed almost over night. London found herself the rather unwilling harbinger of many a shipwrecked traveler, men and women without home, food, shelter, or friends, and with nothing in their pockets that resembled real money. Willing as they were, the American consulates and the Embassy found themselves overwhelmed with the care of a disorganized horde of scared women and brainless men. The American Ambassador, in this emergency, thought of an American, well known in London for his capacity and executive ability. He called up H. C. Hoover and asked if he would lend his assistance. He would; and within a few hours Hoover had organized a force, the members of which were busy in financing and moving, in orderly manner, this crowd of lost or strayed Americans.

"Hoover was a mining engineer; his relief organization was chiefly of engineers, most of them mining engineers. They were selected not *because* they were mining engineers; they were selected because they had had experiences fitting them for handling any sort of unexpected human, physical, or financial trouble. Many of them had themselves been stranded, lost in darkest Africa, near death's door in half a dozen places, and had tackled and handled successfully much worse situations than the feeding and shipping of a lot of stray sheep in a place where there was plenty of food and lots of shipping. Hoover's assistants were chosen for

their ability; it only happened that they were nearly all mining engineers.

"This work having been finished so successfully, it was only a short time until another big organization problem presented itself, one of vast proportion and of complications scarcely conceivable at its inception—the relief of the Belgians. Without a moment's question this stupendous task fell to Hoover, the mining engineer—a task involving problems of commerce, finance, and diplomacy all conducted under most unfavorable conditions. Again Hoover called for suitable help, and again he found it largely among the mining engineers, men who had met unexpected situations and acquitted themselves with credit. An English critic of the work describes it as "the formation of the largest and most successful grocery business in the world, and it was done in less than six months." This success in Belgium was in no way due to official support from the United States. Indeed, not only were moral and financial support lacking from our Government, but the members of the commission were instructed to get out of the country, instructions that were reluctantly and slowly followed."

We need not dwell further on Hoover's work; it is too well known. As most of our readers well know, the mining engineer is very often in a position where he must provide for the wants of large numbers of men in places and under conditions that would discourage most people. He has often to be a pioneer and then the father of a large community. He soon learns to take more interest in humans than in machinery. Consequently we were not surprised, though very pleased, when we learned of Hoover's work. Nor were we much surprised to read in the newspapers this week that Col. J. W. Boyle is in charge of the work of feeding Roumania, and that he is arranging to purchase food in Canada. Col. Boyle is president and manager of one of the biggest gold mining concerns operating in the Yukon.

Next to feeding the starving, one of the duties of most human interest is that of caring for disabled soldiers. Here too we find mining engineers taking a large part. The difficulties confronting those who took up this work in Canada attracted the attention of a Canadian mining engineer, Mr. W. E. Segsworth of Toronto. Mr. Segsworth's endeavor to assist returned men to qualify themselves for good positions in industry and to see that they were given preference by employers, led to his being appointed Administrator of Vocational Training. During the past two years he has devoted all his energies towards helping the re-

turned soldiers, especially the disabled. As a result, he has seen the Vocational Training work in Canada develop into one of which the country can well be proud. The story of this work has not yet been widely told; but those who are close to it know that in this, as in the battlefield, Canadians are leading the advance. Mining men are naturally pleased to see that a mining engineer is taking such a large part in this work. Needless to say, he has among his helpers many mining men. His chief aid in Ontario is H. E. T. Haultain, who is professor of mining in the University of Toronto, and who devotes about twenty hours a day to his work as Vocational Training Officer for Ontario. Like Mr. Segsworth, he receives no salary. Those of our readers who attended the National Exhibition in Toronto last September and saw the exhibit put on by the Department of Civil Re-establishment, will have some idea of the earnestness of the soldiers who are being helped to get back into civil life by such men as Segsworth and Haultain. We look forward to seeing similar assistance given by the Government to disabled men of all classes. These mining engineers will not be satisfied when they have returned to industry all disabled soldiers. They have started something that will doubtless result in more thorough training for industry of all classes of young men. We may be pardoned for claiming that the mining industry is contributing something besides minerals and metals to Canada's welfare. Segsworth and Haultain are doing work of very praiseworthy character, and they are accomplishing much more than is yet generally known.

THE RELATION BETWEEN IGNEOUS ACTION AND CRUST MOVEMENTS.

There are few who are so well qualified to write on the subject of igneous activity and igneous rocks as is Dr. Alfred Harker. There has recently been brought to our attention a copy of Dr. Harker's presidential address delivered at the anniversary meeting of the Geological Society of London, last year. He discusses particularly igneous activity as recorded in the rocks of Great Britain, and he does not dwell on the economic importance of his observations. His remarks contain, however, suggestions that may assist in the unraveling of the history of ore deposits, and thus give some assistance to those who search for ore.

In his address, Dr. Harker devoted his attention particularly to the relation between igneous action and crust-movements. In the study of the structural features of ore deposits there has been a tendency to deal with these phenomena as independent. As Dr. Harker points out, "the link connecting these two classes of effects is found in. The consideration that both afford relief to the unequal stresses which are continually being set up in the earth's crust by causes regional as well as cosmic."

Dealing particularly with observations in the British Isles, Dr. Harker states that the whole geological history of Britain can be viewed in relation to three car-

dinal events—the three systems of crust movements which at widely separated epochs contributed largely to the building of the country. "Each great system of crust movement has been attended by a display of igneous activity, related to it in a manner which clearly bespeaks some underlying law of causation. There is in each case evidence of extensive platonian intrusion within the disturbed area, either at the crisis of the disturbance, or following it after no long interval by geological reckoning. These copious intrusions of magma, no part of which reached the surface, are not only events of the first magnitude, but seem to differ functionally from the igneous action which characterizes other stages of the cycle. This more diffused activity, taking the form of extrusion as well as intrusion, is developed during the gathering of crustal stress before the critical epoch, and again especially in the later waning stages. It has many features suggesting that the several episodes which can be distinguished have their proper places in an ordered sequence. When there has been igneous action during a season of relative quiescence, this, too, has its own significant characteristics. . . . We shall not, however, appreciate fully the relation between igneous action and crustal stress, unless we have regard also to the petrographical facies of the rocks erupted at different phases of a complete cycle. It is becoming increasingly evident that magnetic differentiation is closely bound up with progressive crystallization, the essential factor being a separation, or partial separation, effected between the crystalline and the fluid portions at one stage or another of the process."

In support of his hypothesis that "the distribution of crustal stress is a dominant factor in determining the petrographical facies of igneous rocks," Dr. Harker gives a brief survey of igneous activity in Britain. He endeavors to show that, at different periods of its history, that area has been differently mapped out into petrographical provinces, and this in a manner quite definitely related to the larger displacements of the earth's crust.

Of peculiar interest to Canadians are Dr. Harker's observations on the pre-Cambrian rocks. He says of the oldest rocks in the Scottish Highlands: "The rocks are of calcic facies, like all other rocks intruded in close connection with powerful lateral thrust. In the South-Eastern Highlands especially it is clearly seen that the earliest intrusions of magma preceded the climax of the disturbance, so that the basic members of this rock-series met the brunt as rocks already solid; while the later and more acid magmas were intruded near the height of the mechanical disturbance and during its decline."

The average reader will be little interested in Dr. Harker's address, and some may wonder why we have devoted space to it here. We do so because we believe that Dr. Harker's work is likely to be of no little value to those who study the geology of our ore bearing areas. He sees order and sequence where the average observer sees only a complicated assemblage of rocks. Many of

our ore deposits are in pre-Cambrian areas, in rocks whose history it is not easy to decipher. Dr. Harker's words suggest that a fuller understanding of the geology of pre-Cambrian areas will come with research. When the larger geological features are better understood we may expect to read more accurately the history of our ore deposits. When this is possible we will have more reliable guides for those whose work it is to find ore. We wish Dr. Harker every success in his researches. He has remarkable ability in interpreting the history of rocks, and if he continues to work along the lines indicated in his address, we may reasonably expect him to offer many suggestions that will help and encourage his fellow workers and which will eventually be of value in the development of our mineral deposits.

REPLACING COKE BY COAL.

In this number we published an article by Mr. W. L. Wotherspoon on the experimental work in connection with the use of powdered coal in blast furnaces. The work at the Copper Cliff smelter is likely to prove of international interest. Owing to the constant demand for metal, it has not been possible to interfere very much with the steady operation of furnaces, and the experiments are not yet completed. Sufficient success has, however, been attained to warrant the claim that another big advance in metallurgy has been made.

ANNUAL MEETING, A. I. M. E.

International co-operation in mining in North America will be one of the principal topics to be discussed at the 119th Meeting of the American Institute of Mining Engineers, to be held in New York, February 17th to 20th. In the course of the Convention two joint sessions with the Canadian Mining Institute and one joint session with the American Institute of Electrical Engineers will be held. A number of prominent members of the Canadian Mining Institute will be present.

Improving the relations of capital and labor and the possibility of a uniform mining law for North America will be among the principal subjects which the Canadian engineers will discuss with the American Institute. Many of these topics will deal with after-the-war problems of great significance to American business. Three of the four days of the Convention will be devoted to business and technical sessions with entertainment features in the evenings, and the fourth day will be given over to an excursion to the Federal Shipyard at Newark Bay, where the first electric-welded ship is being built. The subject of electric welding is one of the principal ones to be taken up by the American Institute of Electric Engineers in joint session with the mining engineers on Wednesday, February 19th.

Some of the social features of this year's meetings will be: An evening entertainment; visit to the Metropolitan Museum of Art and Senator Clark's Art Galleries; a Matinee; a Reception of the President and the Annual Banquet.

REPORT OF ADVISORY COMMITTEE IS CRITICIZED.

Vehement condemnation of a report credited to the British Columbia Advisory Committee for Scientific and Industrial Research regarding the possibility of the successful establishment of an iron and steel industry in this Province is contained in the daily press and in the comments of public bodies. The report's general conclusion is that there is room for one large plant provided that it is assured of the whole Pacific coast market, but that conditions of manufacturing and market preclude under present conditions the establishment of more than one plant. But the report is also quoted as saying—and this is what is vigorously objected to—that “there does not seem to be, however, much likelihood of the iron and steel industry ever being developed on the Pacific coast to any large extent.” In view of Dr. Alfred Stansfield's finding that there apparently is plenty of magnetite ore of the necessary purity for use in electro-smelting; in view of the special interest which the Provincial Government and Hon. Wm. Sloan, as Minister of Mines, is taking in the development of the iron ore resources of the Province; and in view of the general feeling among the business men of British Columbia that the initiation of an industry which will utilize the iron deposits now idle, and which while as yet unexplored are believed to be very extensive, it is felt that the latter statement in particular is absolutely unjustified. At a recent meeting of the Vancouver Board of Trade one of the members of its Council, Mr. George Kidd, who also is a member of the Advisory Committee for Scientific and Industrial Research for British Columbia, was requested to furnish information on the investigation conducted by the committee with regard to the establishment of an iron and steel industry in British Columbia. The report, in the opinion of members of the Council, was not in keeping with the facts as disclosed by investigations made by mining experts. A Vancouver newspaper wants to know who the members of the Advisory Committee are, and by what right it undertakes to say that “there is not much likelihood, etc.” It adds: “Surely it is not the business of government employees to go out of their way to gratuitously belittle the prospects of any section of the Dominion.”

May Develop Copper Deposits on Ecstall River.

Reports are current that the Granby Consolidated Mining & Smelting Company proposes to develop the copper deposits of the Ecstall River, Northern British Columbia, which were prospected last season, and which are said to be most promising, on quite an extensive scale. Rumor has it, and it is given for what it is worth as such, that the company contemplates establishing a smelter at some point on the sea coast opposite the aforementioned deposits, and that a route from the property to the suggested site has been surveyed.

Mr. N. J. Everett, former manager of the Porcupine V. N. T. Mine of Porcupine, has taken over the management of the Davidson gold mine, succeeding D. Sloan, who, for a considerable time, managed the Davidson.

Larder Lake Gold Area

By PERCY E. HOPKINS.*

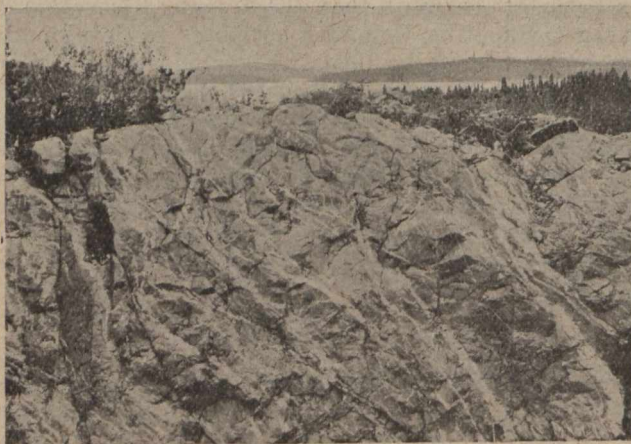
During the first week in October, 1918, the writer examined the working properties at Larder Lake. Since little has been published recently on the area, a brief history and geological summary of the camp may not be out of place. The properties, which are being worked, and a newly-discovered pyrite deposit, will be described, and mention will be made of the hydro-electric development.

History.

Larder lake lies 18 miles by wagon road east of Dane station at mileage 160 on the Temiskaming and Northern Ontario railway. The finding of gold at Larder lake in August, 1906, by Dr. Reddick, caused a rush of prospectors to the area during the following winter of 1906-07, when a few thousand claims were staked. The Larder Lake Mining Division was formed, and J. A. Hough appointed Mining Recorder at Larder City in June, 1907. Development following the "winter stakings" resulted in much disappointment, as is often the case, and finally most prospectors left the area, and the recording office was moved, in March, 1911, to Matheson. Desultory mining has been carried on at two or three properties since. The total gold production is in the neighbourhood of \$25,000, coming from the Associated Goldfields (Harris-Maxwell), Mine d'Or Huronia and Reddick.



Face of Drive on 500 ft. level, in ore containing visible gold. Harris-Maxwell property, Associated Goldfields, Ltd.



Gold Bearing Quartz Stringers in Dolomite.—Open pit on Harris-Maxwell property. Associated Goldfields, Ltd.

Literature.

In 1901 Willet G. Miller,¹ Provincial Geologist of Ontario, passed through Larder lake, then called Lake Present. In 1903, W. A. Parks,² of Toronto University, described the geology along the chief waterways of the area. In June, 1907, R. W. Brock,³ who afterward became Director of the Geological Survey of Canada, examined and reported on an area in the vicinity of Larder lake for the Ontario Bureau of Mines, this report being accompanied by a geological sketch map. His assistant, N. L. Bowen,⁴ continued geological work during the remainder of the summer and published a more detailed map and a brief report. M. E. Wilson,⁵ spent 1908 and 1909 in the area, and published detailed maps and reports. In September, 1915, A. G. Burrows⁶ examined La Mine d'Or Huronia and a part of Gauthier township.

Geology.

The geology of Larder lake is similar to the pre-Cambrian in many other parts of Ontario. The oldest rocks are dominantly volcanic and consist of greenstones and green schists. Associated with them are sedimentary bands of ferruginous carbonate, iron formation, slates, and conglomerate, with an almost vertical dip, which have their greatest development along the north shore of Larder lake, and are traceable westerly to Kirkland lake. The rusty-weathering carbonate is intersected by quartz and calcite stringers which carry most of the gold in the area, and hence will be mentioned in greater detail. Cutting the above rocks are porphyry and aplite tongues, presumably from the large granite batholith to the southeast. Resting unconformably on all these rocks are erosion remnants of conglomerate, greywacke and arkose of the Cobalt series. The diabase and gabbro dikes represent the latest ingenious activity, and are the youngest rocks of the area.

Rusty-weathering Carbonate (Gold-bearing Formation.)

Rusty carbonate rocks are found in or near many of the gold areas of northern Ontario. They are, however, more widely distributed in Larder lake than elsewhere, and important since they appear to contain a greater quantity of gold than the other rocks of the area. Gold, however, does occur in aplite on the Gold King, and in the porphyry and green schists of La Mine d'Or Huronia. Hence it is believed that the gold is related to these aplite-porphyry intrusions and, therefore, indirectly to granite. These rusty-weathering carbonates are in places dolomites which occur in bands up to 300 or more feet in width. They

*Geologist, Ontario Bureau of Mines, Toronto.

¹ Lake Temiskaming to the Height of Land, by W. G. Miller, Ont., Bur of Mines Report, 1902, pp. 214-230.

² The Geology of a District from Lake Temiskaming northward, by W. A. Parks, Summary Rep. G. S. C., 1904, pp. 198-225.

³ The Larder Lake District, by R. W. Brock, Ont. Bur. of Mines Report, 1907, pp. 202-220.

⁴ Ont. Bur. of Mines Report, 1908, pp. 10-11.

⁵ Larder Lake and Eastward, by M. E. Wilson, Summary Report Can. Geol. Surv., 1909, pp. 173-179. Geology and Economic Resources of Larder Lake, by M. E. Wilson, Memoir No. 17-E. Can. Geol. Surv., 1912.

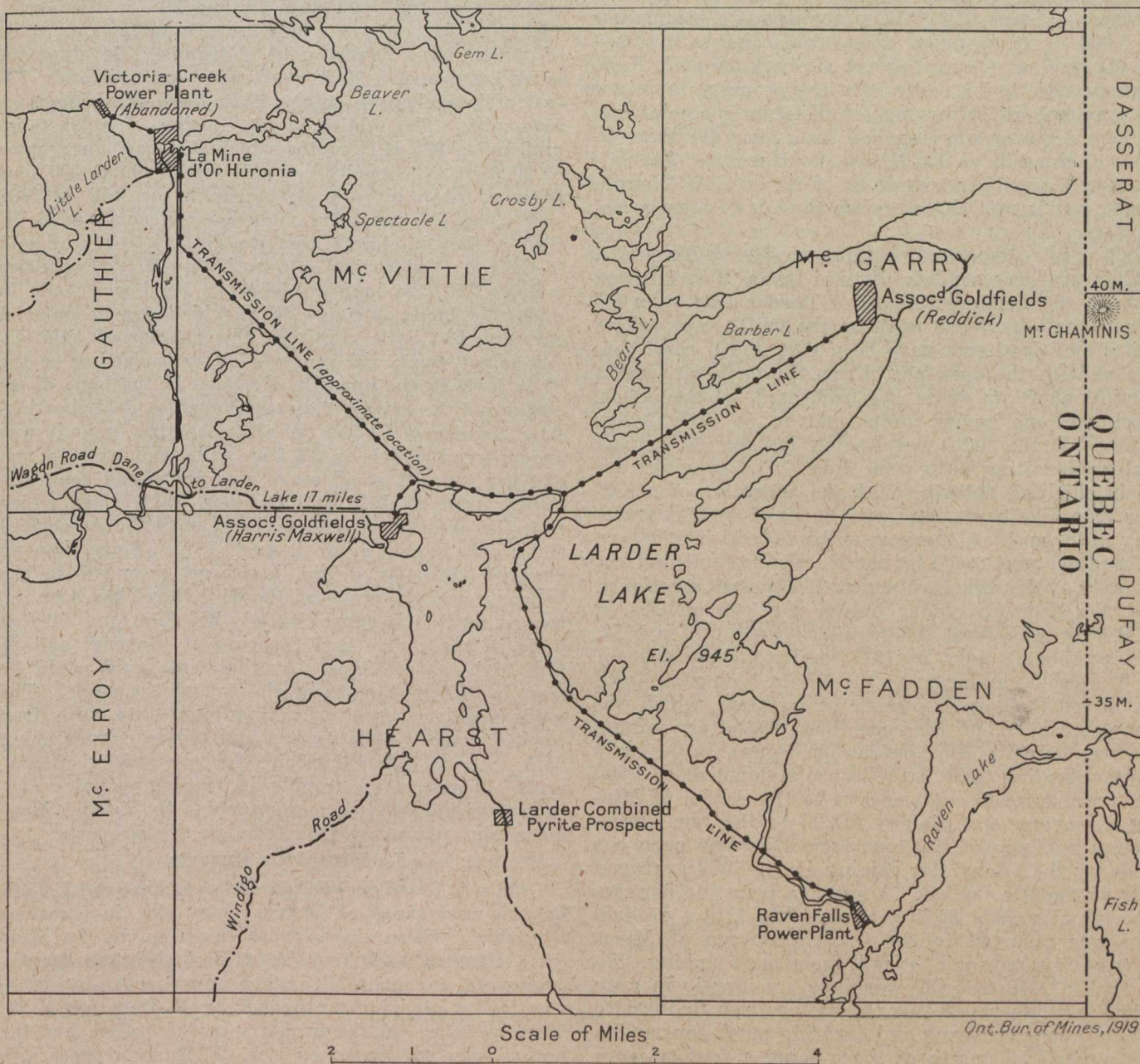
⁶ Gold in Gauthier township, by A. G. Burrows, Ont. Bur. of Mines Report, 1917, pp. 252-257.

are usually brown in color, but often large parts of them have been altered to green fuchsite or mariposite, serpentine and talc. They are intersected by a network of quartz and calcite stringers, which in places carry low gold values over wide widths, and frequently small ore shoots or spectacular gold showings. Although this association of rocks and mineral solutions does not form ore in many parts of the world, still it resembles somewhat the ore bodies on the Rawhide mine, southeast of Angels Camp, California. Small, medium-grade ore shoots do occur, as on the 83-ft. level of the Reddick and 500-ft. level of Harris-Maxwell, but they are isolated, with little to indicate where they will be found, and what will be their extent. The passing from ore into barren material is known only by the disappearance of visible gold and low assay values, and not by a change of formation. Since the known richer shoots are small and scattered the success of mining will depend upon the working of a large tonnage of low-grade ore, which

will necessitate much capital and very detailed mining. Electric power being available, a careful systematic surface sampling can be made of large areas of mineralized dolomite at a reasonably small cost, with the view of locating low grade ore over considerable widths. Air pipes could be extended across such areas, and hand plugger drills used to sample the dolomite at an inch or so below the oxidized surface.

Associated Goldfields.

The Associated Goldfields Mining Co., Ltd., is operating Block "B" and Block "D" formerly known as the Harris-Maxwell and Reddick respectively. Power is supplied from their own hydro-electric plant at Raven falls, all three properties having telephone connection. In addition the company has a telephone line to Dane station. The president of the company is Geo. A. Mackay, with head office at 306 C.P.R. Building, Toronto. C. G. Dampreé is general superin-



The Larder Lake Gold Area.

tendent, and D. A. Anderson electrical engineer. The writer is indebted to these gentlemen for courtesies extended him.

Raven Falls Hydro-Electric Power Plant.

The power station is situated on Raven lake, at the entrance of Raven river. Larder lake serves as a storage basin. The water is fed by a flume 6 ft. in diameter and 1,280 ft. long, and the turbines operate under a head of 6 feet. According to A. R. Webster, Mining Inspector for Ontario Bureau of Mines, two horizontal turbines of 800 H.P. each run two 700 K.W. generators. The voltage is stepped up from 2,400 to 13,200 through three transformers of 300 K.W. each. Power is then transmitted $7\frac{3}{4}$ miles to "the Narrows" on Larder lake, where the line divides, one branch going $4\frac{1}{2}$ miles northeasterly to the Reddick and the other $2\frac{1}{2}$ miles westerly to Harris-Maxwell and an additional $5\frac{1}{2}$ miles northwesterly to La Mine d'Or Huronia, making in all about 21 miles of transmission line (three phase, sixty cycle) as shown on the accompanying sketch map. At the Reddick the voltage is stepped down to 2,200 through two 150 K.W. transformers. Here a 225 H.P. motor drives a compressor of 2,000 cu. ft. capacity. The branch line to the Harris-Maxwell is stepped down through two 75 K.W. transformers to 550 volts. On the property there are various motors for driving the different pieces of machinery. Power was supplied for a time for the running of the mill on La Mine d'Or Huronia. The latter had a small electric plant of its own on Victoria creek, but it was closed owing to lack of storage capacity.

Block "B" Associated Goldfields (Harris-Maxwell).

This property consists of two claims, H.S. 114 and 115, on the northwest shore of Larder lake. An inclined shaft has been sunk to the 65-ft. level, where drifts and cross-cuts have been run, and a raise connected with the open pit. From the open pit level a vertical shaft or winze has been sunk to the 500-ft. level, stations having been put in at each 100-ft. depth. On the 500-ft. level about 150 feet of drifting and cross-cutting have been done. The openings are all in silicified dolomite with the exception of a narrow trap dike occurring in the inclined shaft or tramway to the mill. A 10-stamp mill was built in 1908 and a few trial runs made by the Harris-Maxwell and the Lucky Boy Mining Companies. The last mentioned had the property under option for two months in 1909. An additional 30-stamp mill was built in 1912, and completed early in 1913, under management of E. T. Brooks, and run by electricity supplied from the Raven Falls hydro-electric power plant, which was completed at about the same time. Desultory mining has been going on since operations began. In the early days, according to M. E. Wilson, "a shipment of 1,500 lbs. from an open cut was sent to the School of Mining, Kingston, and yielded \$13.20 to the ton. However, a mill run of 230 tons from the same open cut made by the Lucky Boy Mining Co. in 1909 averaged only 45 cents to the ton. A mill run from another surface showing gave \$2.20 per ton." In 1913 a production was reported to the Ontario Bureau of Mines from ore put through the mill from shaft sinking. To a depth of 440 feet the workings are largely in grey dolomite while below this the rock is rich in fuschite cut by quartz stringers and carrying much tourmaline and pyrite, the quartz at times being a foot or more in width. On the 500-ft. level a drive was run into 30 feet of this material containing visible gold, some

of which is quite coarse. The size of this ore shoot has not been determined. The gold, some of which is quite pale in color, suggesting the presence of silver, is usually accompanied with much fine galena. The plant, which is equipped with various motors, consists of a 40-stamp mill with crushers, amalgamation plates, Wilfey tables, hoists, compressor saw mill, planing mill, and carpenter shop. The mill is not running at present. Forty men were employed on the property on October 1st. The company intends developing on a much larger scale in the near future.

Block "D" Associated Goldfields (Reddick).

The Dr. Reddick, the pioneer property in the area, consists of two claims, H. J. B. 29 and 30, on the northeast arm of Larder lake. The gold deposits are on the former claim and a 20-stamp mill, not in use, 1,000 feet distant near the lake shore on the latter claim. This is the property on which gold was first reported to have been found at Larder lake. The rocks consist of alternating bands of dolomite and green schists, probably all sediments, striking approximately east and west and dipping 70° to the north. The dolomite contains a network of quartz veins, some of which have coarse gold showings. Development work consists of a 90-ft. shaft with approximately 725 feet of lateral work on the 83-ft. level, and numerous open pits. The mining plant consists of a 20-stamp mill and a 225 H.P. motor which drives a compressor of 2000 cu. ft. capacity. A mill run of about 100 tons from an open pit was put through the mill in 1908 and a small production recorded. According to M. Ogilvy, then in charge, this ore ran \$10 to \$12 of gold to the ton. On further exploration by H. P. Depencier a drive 350 feet long at the 83-ft. level was made in under the large open-cut, all of which was in material carrying but little gold. In the summer of 1911 development work was renewed by cross-cutting at the 83-ft. level in the opposite direction in the hope of ascertaining the extent of a second surface gold showing. At a distance of 62 feet from the shaft an orebody was encountered which is 20 feet wide and said to run \$10 per ton. A small stope was made and some ore milled between July and October, 1911. After which time the property remained closed until the Associated Goldfields bought it in August, 1917. Since then an electric transmission line has been extended to the property and the stope on the 83-ft. level has been extended until it is approximately 250 feet long, 20 feet wide in the centre and tapering at the end, and 25 feet high (Oct., 1918). At that time gold could be seen in different parts of the top of the stope. The gold usually occurs in a fine-flour state with iron pyrites, some copper pyrites and native copper along dark seams of chlorite, calcite, fuchsite and other minerals. There is no trouble in finding samples containing visible gold on many parts of the dump. More aggressive mining will be done on this property.

La Mine d'Or Huronia.

Gold was found in 1912 on claims L.2586 and L.2587, on the west shore of Beaverhouse lake, in Gauthier township. These claims were taken up by La Mine d'Or Huronia and have been worked intermittently ever since, except in 1915 when an extensive examination was made of the property by A. Pare for N. A. Timmins who had the property under option, but the option was not exercised. A. G. Burrows describes the quartz veins as being narrow, and striking north-east in a greenstone cut by quartz porphyry dikes,

Gold is visible, accompanied by iron pyrites, copper pyrites, magnetite and calcite. Gold also occurs in veinlets in the porphyry. Development work consists of numerous test pits, approximately 1000 ft. of underground work and considerable diamond drilling. The plant comprises a 15-stamp mill, a tube mill, Dorr classifier, 3 concentrating tables, 2 slime tables and a cone classifier. Power was supplied for a time by the company's hydro-electric plant on Victoria creek, $\frac{3}{4}$ of a mile distant, but owing to scarcity of water the plant could not be operated for long. By Dec. 10th, 1915, a transmission line was completed from the Associated Goldfields and ample power obtained. The mill ran part of 1916, but the property was closed on Dec. 2nd, 1916, the total gold production being approximately \$9,165. Operations were again resumed at the end of 1918.

Other gold prospects upon which some work has been done and worthy of mention are the Gold King, Chesterville, Kerr-Addison and Larder Lake Proprietary.

The tourmaline at the Harris-Maxwell and the magnetite on La Mine d'Or Huronia suggest that the deposits were formed at a high temperature and pressure and at a great depth.

Iron Pyrites Prospect in Hearst Township.

A promising pyrite prospect occurs on claim H.S.904 or No. 2717 on Sharp Creek, one-half mile from the southwest bay of Larder Lake, in Hearst township. This is one patented claim of a group owned by the Combined Larder Mines, Ltd., in which James Hales, Barrister, Imperial Bank Building, Toronto, is interested. The claims were extensively prospected near the surface for gold several years ago, but apparently with little success. In October, 1918, the writer while examining some of the old workings noticed that a mineral dump on the above claim, H.S.904, consisted almost entirely of massive iron pyrites with some gossan. The shaft was full of water, but the owners reported the shaft to be 25 feet deep with a 25-ft. cross-cut at that depth, all of which were in pyrite. The dump consists mainly of fine-grained massive pyrite with occasional quartz and dolomite stringers carrying a little pyrrhotite and magnetite. An eight-pound sample which was fairly representative of the dump yielded on analysis 43.00 per cent of sulphur and 40 cents of gold to the ton. About 100 yards northwesterly from the dump with intervening drift-covered surface is a deposit of 'sugary' quartz and 100 yards farther along the same strike is a 30-ft. shaft in a banded formation of 'sugary' quartz with much pyrite and pyrrhotite. The rocks in the vicinity are dominantly green chlorite schists and pillow lavas. The deposit is apparently worthy of further development. It lies 12 miles distant from the T. & N. O. Ry., and $1\frac{1}{2}$ miles from the Associated Goldfields hydro-electric transmission line. Massive iron pyrite several feet wide was also seen at a 6-ft. pit on claim H.S.913 in the southeast part of Hearst township.

GREENLAND'S MINERAL RESOURCES.

Recently a report was published in the newspapers that Greenland might be offered to Canada by Denmark if the Allies would agree to certain annexations by Denmark. In the Toronto "Globe" an editorial writer offered the opinion that ownership of Green-

land was undesirable. Similar remarks were made in the United States years ago concerning the proposal to purchase Alaska. There is no evidence of wealth in Greenland comparable with that of Alaska; but the possibilities are worth looking into.

Replying to the Globe's editorial, Dr. W. G. Miller, Provincial Geologist of Ontario and Canada's representative on the Imperial Mineral Resources Bureau writes: "You say 'the exports include seal oil, and seal, fox and bear skins, fish products and eiderdown.' But you have not mentioned the most unique of the exports, viz., the mineral cryolite. Greenland is the only country in the world that produces or has produced this valuable mineral. Cryolite has been found in a couple of other countries, but not in economic quantities. The mineral is a fluoride of sodium and aluminum and is used for several purposes, notably in the manufacture of an opalescent glass, and of enamel for ironware; a large quantity has been employed in the production of aluminum. Associated with the cryolite are small quantities of the ores of zinc, lead and copper.

"The unique deposit was discovered at the end of the eighteenth century and mining began in 1854. It extends on the surface 600 by 200 feet. The depth to which mining has been carried is over 150 feet and the deposit shows no signs of giving out. Up to 1901 a total of over 307,700 tons had been mined. In recent years the production has been from 10,000 to 14,000 tons annually. About one-third of this is exported to the United States; approximately one-half of which is re-shipped to Canada for use in the aluminum industry. Canadian imports from the United States in 1913 had a value of \$50,905; in 1914 the value was \$44,683, and in 1915 it was \$72,024.

"Another unique mineral occurrence in Greenland is that of the native iron that occurs on Disco Island on the west coast. Large blocks of almost pure iron were found lying loose on the hillsides and were originally supposed to have a meteoric origin, but later the native metal was found in place in basaltic rocks.

"The largest known meteorite, called "Ahnighito" or "The Tent," was discovered in Greenland. It was brought from Cape York some years ago by Rear-Admiral Peary and is now in the American Museum of Natural History, New York. It weighs $36\frac{1}{2}$ tons.

"Let us get Greenland if we can and turn some of our well-trained prospectors loose there! They may find other mineral deposits, which will easily wipe out the yearly deficit you mention, that is only \$30,000. The country as yet has had little encouragement, trade being a monopoly of the Danish Crown. The fisheries are also capable of much larger development."

The name of Mr. George Torrance Milne, His Majesty's Trade Commissioner-General in Canada and Newfoundland, is included in a recent list of Officers of the Order of the Empire (Civil Division) in recognition of services rendered during the war period. Previous to his recent appointment to Montreal, Mr. Milne was British Trade Commissioner in Australia for five years. He has also resided in various parts of South America. He is a Medallist of the Royal Society of Arts, London, and a Fellow of the Royal Geographical Society.

Pulverized Coal in Blast Furnaces

Use and Application of Pulverized Coal to Blast Furnaces as developed by Experimental Work at the International Nickel Company's Smelter at Copper Cliff, Ont.

By W. L. WOTHERSPOON.

I appreciate the interest readers of the Canadian Mining Journal will have on this subject as the influence on the economic aspects of smelting is far reaching. Our experimental work is not yet finished, and I am not prepared at this date to deal with the subject as I should desire. However, the following information may be of interest.

The use of pulverised coal in blast furnaces for the melting of metals, smelting of ores, etc., owes its conception to the ideas of Mr. U. A. Garred, and Mr. Thomas W. Cavers, the former an American Engineer, who was formerly Chief Engineer at Washoe Smelter of the Anaconda Copper Mining Company, and who later was engaged on important engineering work with the Mount Morgan Gold Mining Company, Mount Morgan, Queensland, Australia; and more recently at the copper refinery of the Nichols Copper Company, Laurel Hill, Long Island. Mr. Garred has been closely associated with the writer during the past two years, but it is only recently that it was possible to conduct experiments on a large scale at Copper Cliff, owing to the fact that the whole energies of the staff and employees of the International Nickel Company were needed for the nickel requirements of the Allied Governments, which included very heavy responsibilities, not only in operating for production, but in extensive construction work, included in which is the Port Colborne Refinery, constructed at an expenditure of over \$5,000,000. However, a few months ago, Mr. Garred was able to take one of the standard blast furnaces, smelting 500 to 600 tons a day and, by making small modifications to it, proved by practical demonstration that a considerable portion of the coke could be replaced by powdered coal. Extended runs have taken place with normal percentages of coke—namely, 12 per cent reduced to about 6 per cent, with deficiency in fuel supplied in the form of powdered coal, thus showing, even under those conditions, very important economies. However, Mr. Garred feels that his experiments should be carried further, and that very soon he will be able to reduce the coke consumption still further, if not replace it entirely.

While Mr. Garred was proceeding with his development work, Mr. Cavers, a Canadian, was engaged at the Tennessee Copepr Company, Copper Hill, Tenn., on work of a similar character. The results at Tennessee have been like those at Copper Cliff, very encouraging, as may be inferred from the following data. The work carried on by Mr. Cavers applied to standard blast furnaces with run of mine ore. Under normal conditions, consumption of coke with such ore amounted to 6 per cent. Several months ago two runs, one of twelve days, and another of fifteen days, were arranged, when the coke was replaced in its entirety by powdered coal, and the percentage of the latter used amounted to 3.8 per cent. This showed not only that an expensive fuel could be replaced by one of considerable less cost, but that there was a decreased tonnage of fuel required, amounting to approximately 30 per cent.

At Tennessee the manufacture of sulphuric acid from

the blast furnace gases was of the greatest importance, and as a portion of that acid was used in connection with the manufacture of high explosives, it was decided by the management not to continue the use of powdered coal until the end of the war, owing to the anxiety of the inspector, who felt there was some chance of small quantities of unconsumed carbon causing discolorization of the acid. These special conditions are happily over, and the Tennessee Copper Company has now arranged to proceed actively with the use of powdered coal, and plans are in preparation for the utilization of the Garred-Cavers processes in three additional furnaces.

Patents have been granted to Messrs. Garred and Cavers in the United States, Canada, and many other countries, and other important patents are pending.

The processes are revolutionary, in that combustion of pulverized fuel takes place under pressure in the restricted spaces in the charge of the furnace. These spaces are the voids in the charge of ores, fluxes and by-products, and the channels in same that occur in the smelting zone. Under certain circumstances, for special cases, additional combustion space is provided by specially designed furnace jackets.

The pulverized fuel is prepared in the usual way and fed in predetermined quantities to the tuyeres of the furnace, where it meets the air blast supplied in the usual manner.

A company, known as the Garred-Cavers Corporation, has been organized, with offices at 43 Exchange Place, New York City, for the purpose of developing the work embodied in the Garred-Cavers patents, and there has already been shown great interest in the work done to date at Copper Cliff and Tennessee, which is particularly encouraging to those smelting companies whose operations are carried out in certain localities where the coke problem has been acute. For instance, in Peru there are smelters and there are coal mines, but in the past it has been necessary to ship coke to the smelters from the United States. There are also smelters in Africa and the Belgium Congo, where coke was supplied from England.

The possible economies are far reaching. Under the auspices of the Garred-Cavers Corporation an aggressive policy in connection with the development of the processes will be pursued.

Rocky Hard Coal Co.

The Rocky Hard Coal Company, which has large interests in what is known as the Alberta Coal Branch of the Grand Trunk Pacific, are actively operating on a large hill of coal which extends 60 feet above the level of the railway tracks, coal being taken from a facing of about 400 feet. The field is located near Coalspur station, 47 miles south of the town of Edson.

The coal is of good quality, and is being shipped as far East as Winnipeg. Its accessibility is indicated by the fact that steam shovels are being used in loading the coal directly from the coal beds into the cars.

Coal Production in Canada--Its National Significance

By F. W. GRAY.

The Federal Department of Mines announces that the production of 15,180,000 short tons of coal from Canadian collieries during 1918 is the largest annual production yet recorded for Canada. The significant figures are the reduction of 337,000 tons in Nova Scotia, and the increase of 1,263,000 tons in Alberta, when compared with 1917 tonnages. For the first time also the coal output of Nova Scotia takes second place among the Provinces and Alberta leads with a production approximately estimated at six million short tons.

The continued reduction in the coal production of Nova Scotia is a direct result of war conditions, chiefly associated with and arising out of heavy enlistments of skilled miners in 1915 and 1916.

The increase in Alberta's coal output is doubtless the result of the campaign carried on by the Fuel Controller early in the year 1918 to encourage the use of Albertan coal in substitution for anthracite imported from the United States, and possibly also some export of coal from Alberta to those districts of the United States lying directly to the south of the coal districts.

While, therefore, the outstripping of Nova Scotia by Alberta may at this time be regarded as a direct result of the war, and while it may be that during the next ten years we may see some attempt in Nova Scotia to regain the hitherto unchallenged position of that Province as the leading coal producer in Canada, yet the figures of 1918 have only anticipated an inevitable development of the future. As the population and industries of the Prairie Provinces increases, the relatively large coal resources of the West will become apparent, and Nova Scotia will do well if it holds the second place for any great number of years.

Great significance of the future of Canada, and great influence on the political orientations of the future, lie in these latest figures on coal production by provinces. The problem of the "manufacturing East" and the "agricultural West" that is so often dilated upon, and which has recently been emphasized by the belligerent, not to say selfish, platform adopted by the Western farmers, bids fair to assume a new aspect. Coal production always connotes industrial and manufacturing growth, and when the West commences to fulfill the destiny that is implicit in its combination of agricultural lands of vast extent, combined with mineral resources that far exceed those of the Maritime Provinces, the people who live "down East" will be compelled to hard thinking. Maritime union would seem to be a logical outgrowth from the changing relative conditions of the East and the West. There is a touch of the archaic in the retention by the three Maritime Provinces of New Brunswick, Nova Scotia and P. E. Island, of all the trappings and expenditures of three separate and distinct systems of parliamentary government, each with two legislative chambers, and this slightly archaic and decidedly expensive triplication of government extends into the administration of the natural resources of the mine, forest and sea.

Those who think of Canada as a nation, destined we

trust to live in friendly independence alongside the United States, should not overlook the further significance of the coal production of the United States, which in 1918 reached the unprecedented and stupendous total of approaching seven hundred million tons of coal. In describing the coal output of the United States in these terms there is no desire to strain after superlatives. Coal production on this scale is in simple truth unprecedented in the world's history, and not only is it correct to describe it as stupendous, but one might go further and point out that it is a portent, a fact of to-day's history that should be digested and pondered over. The Canadian production of fifteen million tons, although it may constitute a record, is very small in comparison. National independence in this age of steam and electricity is well nigh impossible without the possession of coal.

There is a vague impression abroad that Canada's deposits of coal are vast and illimitable. This is not so. In consideration of its extent, its traditions of the past, and its hopes of the future, Canada is comparatively poorly supplied with coal deposits, particularly in the East. The coalfields of Nova Scotia represent but one per cent. of the coal resources of Canada, which is equivalent to stating that ninety-nine per cent. of the coal deposits of Canada are situated West of Winnipeg. A proper realization of the comparatively meagre coal resources of our country is a desirable thing to inculcate, because it will lead to a realignment of our ideas along many necessary avenues of thought, and it will emphasize the necessity for careful exploitation and conservation of Canada's coal wealth.

Among the British Dominions, Canada to-day ranks high as a producer of metals and minerals, but the extraction and purification of metals for commercial sale is in the first instance dependent on a supply of fuel. Wood fuel and water-powers have a certain limited application in this connection, but generally speaking, metal industries on a large scale are not possible in the absence of a plentiful supply of coal. In a country of vast distances, where transportation plays such an important part in our political development, and under somewhat rigorous climatic conditions, coal supply assumes an aspect of peculiar importance, an aspect that is not limited to provincial considerations, but is of national and federal importance.

We Should Have a Ministry of Mines.

It can hardly be contended that the coal industry of Canada, or any part of the mining industries of our country, are adequately represented by any ministerial department at Ottawa.

We need a Ministry of Mines, the creation of a portfolio in the Cabinet with real powers, assisted by ample funds, and employing under the leadership of a Minister of technical and financial ability, the specialists that are now scattered through a dozen unco-ordinated departments at Ottawa.

The Canadian Council of Agriculture which recently convened at Winnipeg, stated with becoming modesty that "Agriculture is the basic industry upon

which the success of all other industries depends." Well, maybe so, but will the agriculturists explain how modern agriculture could exist without coal and metals?

We will not say that mining men are modest, but it can be truthfully stated that the real importance of mining to Canada is but poorly appreciated by the country at large, and the basic nature of mining in Canada is overshadowed by the greater unity and possibly the greater vociferation of lesser breeds, who, if they are not already outside the law, are getting pretty close to being so, if the Winnipeg meeting of the farmers is indicative of the real feeling among these lords of the western lands.

A Ministry of Mines is being urged for Great Britain. A more far-reaching and pregnant proposal involves the co-ordination of the mining resources of the Empire, and their exploitation for the benefit of the associated nations thereof. Canada should not stay behind the procession. The mining industry should be represented in the Federal Parliament, and it should have a Minister of Mines to give it a voice and a policy.

BRITISH COLUMBIA'S COAL OUTPUT IN 1918.

With figures available which make possible an estimate of the coal output of British Columbia for the month of December it is found that the production of the Province for the year 1918 shows an increase over that of 1917 of approximately 174,096 tons. For the past year the total was 2,572,811 tons these figures, although based on reliable information, are as yet unofficial) as compared with 2,398,715 tons.

To those who have been closely following the past year's development in the coal fields of British Columbia this is a decided disappointment. At the end of the month of September it was thought that the end of the twelvemonth would find the production far in advance of that of 1917. Consequently the small margin indicated while not unwelcome is not considered to be anything like as satisfactory as might have been confidently looked for if hard luck, in the form of the so-called Spanish influenza, had not intervened.

The influenza struck the coal mining camps with special violence. The effect of the epidemic was felt throughout the months of October and November in the output of the mines of Vancouver Island, as well as those of the mainland. But the result was particularly disastrous to the Island's showing, there being a slump which brought the aggregate of its collieries down to 29,139 tons below that of 1917, the total figures being: 1918, 1,666,582 tons; 1917, 1,695,721 tons. Increases, however, can be recorded in the Crow's Nest Pass and the Nicola-Princeton fields. In the former the output of 1918 is 179,200 tons ahead of that of the previous year and that in spite of the fact that for a time the influenza raged throughout that district. The explanation is to be found in the fact that in 1917 the output in the Crow's Nest Pass was seriously affected by the explosion of April of that year and the extended strike which followed. The Nicola-Princeton increase of 23,035 tons, the production of 1918 being 174,278 as compared to 151,243 in 1917, must be put down to development spurred on by the abnormal demand of recent months.

It is interesting and gratifying to be able to note that with the removal to an extent of the blighting influence of the plague among the miners in the month of December, the production immediately began to assume normal proportions. The result is that that month shows an increase of approximately 46,329 tons over the month of November.

Detailed statistics follow:

British Columbia coal production (approximate):
1918 2,572,811 tons
1917 2,398,715 "

British Columbia coal production by districts:

Vancouver Island—
1918 1,666,582 tons
1917 1,695,721 "

Nicola-Princeton:
1918 174,278 tons
1917 151,243 "

Crow's Nest Pass:
1918 731,951 tons
1917 551,751 "

Tonnages for the months of November and December:

	November.	December.
	Tons.	Tons.
Crew's Nest Pass Colliery—		
Coal Creek	24,430	30,000
Michel	14,414	20,000
Corbin Colliery	7,847	8,500
Middlesboro Collieries	6,000	6,256
Fleming Coal Company	2,695	2,674
Coalmont Collieries	616	409
Princeton Collieries	2,263	1,500
Telkwa Collieries	178	150
Canadian Western Fuel Co.	49,121	59,946
Canadian Collieries (Comox)	27,065	44,171
(Extension)	12,807	16,261
(S. Wellington)	4,409	5,639
Pacific Coast Coal Mines	2,914	3,563
B.C. Coal Mines (Jingle Pot)	3,257	4,147
Nanoose Collieries, Ltd.	1,112	2,351
Granby Consolidated	2,010	2,500
Totals	161,138	207,467

NOVA SCOTIA STEEL AND COAL CO'S PROGRAM.

D. H. McDougall, president of Nova Scotia Steel and Coal Company, Limited, announces that the company will take advantage of the slack spell in steel production to overhaul the plant and make certain additions and changes with a view to securing greater efficiency. Chief among these latter will be the provision of new and thoroughly up-to-date by-product coking ovens. Further the Wabana mines will be developed so that the Scotia Company will produce iron ore far in excess of its former outputs and at materially reduced cost.

Hayden Stone and Company, who represent the large United States interests in the Nova Scotia Steel and Coal Company have aided in the developments of these plants which will require considerable time and capital. The position of the company is strong at the present time, having regard to the provision of an additional \$5,000,000 of working capital due to the sale of that amount of stock in 1917 and also to the fact that the company is in a strong financial position with net current assets of \$10,000,000.

Special Correspondence

NORTHERN ONTARIO.

Surveying Des Quinze Water Power.

Signs of activity are apparent in connection with the Great Des Quinze water power project, which is situated some 25 miles northwest from Cobalt. Although very few details are available, it is understood a staff of surveyors were engaged last month by M. J. O'Brien, Limited, a twenty million dollar corporation of Montreal, headed by M. J. O'Brien, of Renfrew. This corporation was formed some time ago for the taking over of the extensive interests previously held by Senator M. J. O'Brien, among which is a part of the great water power of Des Quinze. This is perhaps the greatest undeveloped water power in the Province of Quebec. Various estimates place the power of this wonderful volume of water all the way from 150,000 to 250,000 horse power. Situated as it is, in the central part of the great mineralized area of Northern Ontario, as well as close to the great pulpwood resources of the district, it is considered highly probable a development of great magnitude is under contemplation. Up until the present time no official advice has been given out regarding the intentions of the big corporation. Although the ending of the war was expected to be the signal for extensive developments in the pulp and paper industry of the North, the actual commencement of work on this great power scheme would come as a considerable surprise to the inhabitants. Whether the present survey is for immediate use or for a more distant date is a matter of much speculation. As is well known, M. J. O'Brien acquired the nucleus of his large fortune in the development of the natural resources of the North Country, among which operations the most noteworthy are the O'Brien Mine of Cobalt and the Miller Lake-O'Brien mine of the Gowganda camp. Each of these mines are producing upwards of a million dollars' worth of silver per annum, and have extensive ore deposits in reserve. Therefore, when these extremely important facts are taken into consideration, there appears ample reason to believe the not distant future development of the great Des Quinze power is actually being considered. The development of this power is a matter of great interest to the district in general, providing, as it undoubtedly would, ample energy for the many new industries which no doubt will eventually be developed in the mining, pulpwood and lumbering sections of the North Country, where abundance of raw material awaits but the necessary power and supply of labor to turn it into marketable products.

One Company Asked for 1,000 Men.

One of the Porcupine mining companies recently asked the Organization of Resources Committee, Toronto, to supply them with one thousand men. This mine is presumably the Hollinger Consolidated, where, it is understood, about 2,500 men are required to work the mining and milling plant at capacity. The request was made that the men be supplied, four hundred in the first group and forty per week thereafter until the desired number was attained. During the past couple of years about twelve hundred men have found daily employment at the Hollinger Consolidated, and a one thousand ton daily capacity addition put on the mill has so far not been utilized, except for but a short time. The employment of a working

force sufficiently large to permit of operation at capacity, will be followed by a big increase in ore treated and gold production. During the year just past the Hollinger-Consolidated paid 5 per cent. in dividends, which amounted to \$1,230,000. A plan for the erection of a large number of houses to meet the needs of the increased staff of workmen at the property is understood to be under consideration. The Hollinger-Consolidated mine is the nucleus of the town of Timmins, and housing accommodation in this thriving gold mining town at the present time is said to be inadequate.

Kirkland Lake Mines Forging Ahead.

The prevailing epidemic of Spanish Influenza was a retarding factor in the developments at several of the Kirkland Lake gold mines during the past month. The epidemic now appears to have run its course, making it possible to carry on normal work and the usual production is anticipated for the current month. Taking into consideration the position of the operating mines, together with the various new developments under contemplation on a number of the leading and well-situated prospective properties, it is evident the Kirkland Lake district is entering upon the most active period in its history. With the Kirkland Lake Gold mines almost ready to begin production in a big way, thus joining the Lake Shore and the Teck-Hughes in the producing list, and with the probability of the Tough-Oakes being among the producers within a few months, the Wright-Hargreaves proceeding with the installation of one of the largest mills in the camp, the Burnside having this month about completed the installation of a 30-ton mill, the probabilities are that six mines will be producing gold in the Kirkland Lake district before the end of 1919. The increase in the number of non-producing, but promising properties that will be operated in an aggressive manner during the year may reasonably be counted upon to at least keep pace with the number of producers. The opening month of the year 1919 finds the camp in the best proven as well as prospective position in its history. The developments of the six aforementioned mines have proven the stability of the camp, while the extent of the promising properties on which extensive development work is planned, gives good reason to believe that the producing area of the Kirkland Lake camp will be greatly enlarged.

Potter and Stevenson Properties.

Early developments of an interesting nature are shortly to be expected in connection with a consolidation of the Potter and Stevenson properties in the Kirkland Lake camp. These properties are centrally located, being situated on the south side of the Lake Shore Mines. American capitalists are understood to be concerned in the early development of the properties, which it is expected will soon be in operation.

Will Begin Work at Hunton-Kirkland Soon.

Plans are now under way aiming at the actual commencement of development and exploration on the Hunton-Kirkland property some time in February. A deal was recently closed for the purchase of the property, the first cash payment having been made. The ultimate purchase price is said to be well up in six figures. Some of the richest samples of gold ore ever found in the Kirkland Lake district came from the surface of the Hunton. At the outbreak of the European war, English interests were negotiating for

the purchase of the property, but nothing of a concrete nature transpired. With the ending of the war it was not surprising that these promising claims should attract attention, and the announcement that Toronto and American capitalists will develop the property gives general satisfaction.

Kirkland Townsite.

English interests are understood to be involved in a deal for the Kirkland Townsite property, and while the engineers of the company look upon the proposition favorably, the final ratification remains in the hands of interests in England. In well-informed circles, however, it is believed nothing of an adverse nature will develop, and the final sanction of the terms of purchase will be transacted in a short time.

Tough-Oakes.

It is now considered only a matter of a short time until some definite plan will be decided upon for a resumption of operations at the Tough-Oakes Gold Mines of Kirkland Lake. A general meeting is to be held at which a new directorate will be placed in charge. It is considered probable that at least a portion of the present directorate will remain on the board. According to semi-official advice, Commander Burnie, of London, Eng., is now in control of the company, and from the same source it is also learned that Mr. Kilpatrick, also of England, and who is associated with Mr. Burnie, is soon to arrive in Canada for the purpose of arranging the future policy of the company, on behalf of his principal. In the meantime the mine workings are being kept pumped out, and the large, efficient mill is being kept in a good state of repair. The course to be taken on resumption of operations will probably be an aggressive underground development program for a few months, followed by the re-opening of the mill. Sufficient money to carry out such a policy is said to be now on deposit for the company in Canadian banks. Before becoming involved in its costly and serious litigation the Tough-Oakes was the leading producing mine of the Kirkland Lake camp. For a time a production of approximately \$60,000 monthly was maintained. By those in a position to intelligently judge of the merits of the property it is considered possible that this record will be exceeded, providing the mine is given a fair opportunity. The news of a settlement of the differences of the company's interests is of vital importance to the future of the company, and has been the cause of rejoicing by shareholders in the district.

Boston Creek Merger.

Well-founded reports are current of the merger of the R. A. P. Syndicate property and the Boston Creek mines, of Boston Creek. A merger such as reported to be probable should work out to the mutual benefit of the two companies. On one of the properties is a good mining plant sufficiently large to develop both companies' holdings to a large extent, while on the other camp buildings adequate for the accommodation of a large working force have been erected. On both of the properties considerable underground work has been done, and a good deal of gold ore has been blocked out.

Electric power is available in the Boston Creek field, obtainable from the Northern Ontario Light and Power Company, whose transmission line passes through the camp. The next few months are expected to be important ones in the history of the development of the Boston Creek field.

Burnside Mill Nearly Ready.

The new mill at the Burnside property at Kirkland Lake is receiving the finishing touches and will soon be ready for operation. It is probable the mill would have been ready for operation earlier, had it not been for the fact that a number of wrong parts of the equipment were shipped by the manufacturers. However, all should be in readiness for a trial run by the end of the current month. The new mill has been designed with a capacity of thirty tons per day. Provision has been made for increasing the capacity of the plant according to the requirements of the mine's development. The Burnside adjoins the Tough-Oakes.

Machinery Arriving for Indian Peninsula Mill.

The first car-load of machinery for the new 100-ton mill for the Indian Peninsula Mining Company has been shipped to the property. A first-class road has been cut from the town of Amos on the Transcontinental Railway to the mine. The property is located about twenty-one miles south from the railway and the Quebec Government built fourteen miles of the new roadway to the property, while the company completed the remaining seven miles, making available a good winter road over which the machinery and other equipment for a flotation mill of 100-tons daily capacity will be taken in. The company expects to have the plant treating this amount of molybdenum ore early in the spring. The ore will pass through a 13 x 24 crusher, and be elevated to a bin from where it will be fed by belt feed to a 5 x 5 ball mill in close circuit with a Duplex Dorr classifier, the water being controlled in the ball mill to the desired moisture. A 100-ton Groch Centrifugal duplex unit will be used to float the molybdenite. The plant will be steam driven. The company has cut nearly all the timber for the construction of the mill with its own saw mill plant. The control of the stock of the Indian Peninsula is under option to the Penn-Canadian Mine interests, which assures efficient and energetic development of the property.

Ontario-Kirkland New Plant Ready.

The Ontario-Kirkland property, formerly the Hurd claims, is ready to operate its new electrically operated plant, and is fully equipped with the requisite machinery to carry out the proposed program of more than 1,500 feet of underground work. Some considerable delay in receiving the supply of electric energy took place, or the plant would have been in operation before Christmas. Sufficient capital has been made available for the development program, which includes continuing the 100-ft. shaft to the 300-ft. level, and the driving of about 1,500-ft. of drifts and cross-cuts. Several well-mineralized veins in which gold occurs are in evidence on the property.

Miller-Independence.

Mr. W. E. Simpson, who, together with Mr. Frank Groch, of Cobalt, is consulting engineer for the Miller-Independence Mines at Boston Creek, left the first week in the new year for the mine, for the purpose of thoroughly sampling and surveying the property. The entire surface and underground workings are to be surveyed and sampled. This work is preliminary to the beginning of the big development programme now proposed, and for the carrying out of which the capitalization of the company was raised from 500,000 to 700,000 shares. The new issue of the stock, which consisted of 200,000 shares, is understood to have been subscribed for at \$4 per share, thus proving ample capital for extensive operations.

1,950,000 Tons Proven Ore at the Dome Mine.

According to official advice concerning the affairs of the Dome Mines, the outlook for the company is bright. In many ways the policy adopted during 1917 has been justified. In the light of events which followed the actual curtailment of work, with the exception of a comparatively small force engaged on development and underground exploration work, there was no alternative but to have adopted such a policy. Already costs of conducting mining operations are receding, labor is becoming more plentiful, with a decided improvement in efficiency, and in various ways conditions are adjusting themselves.

Official figures show 1,950,000 tons of proven ore. The average gold content is \$5.10 per ton. The total value is \$9,945,000. Prior to the economic strain caused by the war the Dome reduced its ore at a cost ranging only slightly over \$2.50 per ton. To equal such a record seems the probable thing to expect during future operations. It may be, however, that as mining is carried to deeper levels, the cost of producing may record some increase. It should perhaps be pointed out that the above figures of ore reserves occur in ground between the surface and the 700-foot level. Not one pound of ore below that depth is included in the estimates of close to ten million dollars. Therefore, even though work has been carried to a depth of 1,245 feet, and a considerable lateral work done between the 700-foot level and that depth, and a number of orebodies are being cut, yet its enormous value is not sufficiently proven to be definitely included in the proven ore reserves. This section of the mine, perhaps of greater value than the upper workings, remains as yet a great potential asset, the amount of which will be estimated following the requisite amount of development work. The ore in the lower levels, as so far indicated, is of a higher grade than that occurring in the upper workings. Therefore, any slight increase in the cost of reducing the ore will be compensated for in the higher average gold content. Conservative mining interests estimate the probable profit from every ton of ore treated for the next several years at the Dome, at \$2.50 per ton after paying all costs.

The surplus as of October 31st last, is expected to be sufficient to cover requirements pending the return to a producing basis.

The capacity of the Dome mill and the mining facilities for providing the full tonnage to keep the mill at full capacity is approximately 40,000 tons per month. In computing these figures, all the added energy necessary to hoist ore from great depth is taken into full consideration.

Therefore, treating 40,000 tons monthly, recovering over \$5 per ton or upwards of \$200,000, it follows that with a net profit of \$2.50 per ton the total net profits would approximate \$100,000 monthly. Total output is thus expected to exceed \$2,500,000 annually, with net profits of \$1,200,000.

The company is capitalized at \$5,000,000, divided into 500,000 shares, with a par value of \$10 per share. Just 400,000 shares are issued, the balance remaining in the treasury. Therefore, the company is obliged to pay dividends on only the \$4,000,000 issued capital. It can at once be seen that a net profit of \$100,000 would be equal to 2½ per cent. monthly, or 30 per cent. annually.

Mining at the above rate, the present proven ore reserves of the Dome are four years ahead of mill re-

quirements. Of this upwards of 320,000 tons, or eight month's requirements, is already broken and lying in the stopes, the cost of mining having already been paid for. Also in the extensive workings from the 700-foot level down to nearly one-quarter of a mile the tonnage of ore added to reserves annually from this date forward may reasonably be expected to exceed the tonnage taken out—this to continue for a good many years. In the past the company easily paid dividends at the rate of 20 per cent. annually. With the present improved facilities making possible a maximum profit of 30 per cent. annually, the contention of conservative mining men in declaring dividend disbursements at the old rate will follow close upon the heels of a resumption of production seems quite reasonable—even after making all due allowance for unforeseen contingencies.

Will Develop Fidelity Property.

Fairly extensive plans for the development of the Fidelity property in Teck township adjoining the Kirkland Lake LaBelle Mine have been decided upon. Already a portion of the machinery for the plant has arrived at Swastika, and is being taken to the property. The new plant will be steam driven.

New Development Work in Whitney Township.

Preparations are under way for the starting of mining operations on the two claims north of the Beltinger Mining Company in the northwest of Whitney township at an early date. The claims lie three miles north of South Porcupine, and have been acquired by Toronto interests. There is a 200-foot shaft on the property with 20-feet of lateral work at the 100-ft. level, and 50-ft. of crosscutting at the 200-foot level. A vein of ankerite and quartz stringers running parallel and 35 feet in width has been uncovered. A number of stringers in the main vein carry gold values. Mr. T. J. Wright is in charge of the work of fixing up the road and taking in machinery for the operation of the property.

Steam Plant for Canadian-Kirkland.

Arrangements are being made for the installation of a steam driven mining plant on the Canadian-Kirkland property in the Kirkland Lake camp. The Canadian-Kirkland property was recently taken over by Geo. E. Drummond, of Montreal, and D. H. Angus, of the Right of Way Mines, Cobalt. Providing development work with the steam plant proves satisfactory, later on it is the intention of the new control to install electrically driven machinery.

Alexo Nickel Mine.

During the month of December the Alexo Mine at Porquois Junction shipped 1,015,000 pounds of nickel ore, which is well up to the general average of the mine. The property is located about twenty-five miles east from Porcupine. A large body of peridotite is in contact with the pillow lava on its northern flank. The ore body has been opened up for upwards of 700-feet in length, and has a width of from three to forty feet, and a dip of from 65 to 80 degrees to the north-west.

Power Plant for Gowganda.

Reports are current of the likelihood of the South Bay Power Company proceeding with the construction of its power plant in the Gowganda district with the arrival of spring.

Casey-Cobalt.

During the third week in January the Casey-Cobalt Mine, situated in the township of Casey, about nine miles north-east of the town of New Liskeard, shipped two carloads of silver ore. One carload was consigned to Cobalt, while the other went to Denver, Colo., for treatment. The Casey-Cobalt is the only operation in its immediate vicinity, and is a regular producer of silver ore.

Drilling Cotter Property.

Results of the diamond drilling operations on the Cotter property at Boston Creek have been so favorable that the company operating these claims have decided upon the preparation of plans for extensive mining operations, which will be carried out as soon as possible.

Boston Creek.

The importance of the Boston Creek camp is being more clearly brought to mind every day, with the sensational deposits of gold ore on the Miller-Independence, the Hollinger interests developing the Mondeau, and the Mining Corporation of Canada seeking property in the camp, together with recent developments on the Cotter and Cullen-Renaud properties, it appears certain much substantial development will be accomplished in the district during the current year.

BRITISH COLUMBIA.

Mr. George Fraser has resigned the position of Superintendent of the coal mining operations at Cassidy's, Vancouver Island, of the Granby Consolidated Mining & Smelting Company. Mr. George Hargreaves also has resigned the position of mine manager. The duties of both the foregoing offices have been assumed by Mr. R. R. Wilson, formerly General Superintendent of the Crow's Nest Pass Coal Company, Mr. Wilson is a son of Mr. W. R. Wilson, General Manager of the Crow's Nest Pass Coal Company.

Lack of Interior Lubrication Cause of Hoisting Accident.

A verdict has been given by the Coroner's Jury before which an inquest was held into the cause of the death of sixteen coal miners at Nanaimo, B.C., on September 10th last. It reads as follows:

"We, your Coroner's jury, empanelled to inquire into the death of Robert Kelly and fifteen others in Protection Shaft, of the Canadian Western Fuel Company, September 10th, 1918, find that the said men came to their death by descending on a defective cable, which broke owing entirely to the oxidizing of the wires, chiefly caused by apparent absolute lack of any interior lubrication, leaving the wires thus exposed to the action of a more than normally corrosive water and a humid atmosphere. In view of the evident general unreliability of exterior lubrication measures, which from the evidence adduced failed to preserve to any very appreciable extent the life of said cable or preclude against deterioration, we suggest that the Department of Mines recommend the appointment of an expert inspector of hoisting ropes, cages, safety catches and all appurtenances generally, and that legislation be enacted whereby under such abnormal conditions as obtain in said shaft no new hoisting cable be retained in service longer than some

reasonable time to be determined by the Department of Mines as otherwise there would appear to be no practicable process which can be adopted and absolutely relied upon looking to the absolute dependability of such hoisting cables against defect or breakage under all present governing conditions."

Nanaimo Coal.

Criticism of the quality of coal being turned out in Nanaimo, B.C., by a writer of Vancouver, B.C., is much resented in the former town. One of the papers of Nanaimo observes: "In this connection it must be remembered that the local mines have been working under the same war conditions which have hampered every other industry as well as that of coal mining. Since conscription came into force work has been necessarily cut down to meet the new conditions until lately practically one shift only each day has been the rule. At the same time, with the supply of efficient labor thus reduced, the demand for coal increased from every quarter. In order to meet the enormous demand at least half way it has been found necessary to send out Nanaimo coal without having been, as formerly, washed and screened. At the same time coal of somewhat inferior quality from the Harewood Mine, has been mixed with the coal of the best local quality in order to keep up with the demands from day to day." The writer explains that the public have had to stand for "War Coal" as they stood for "War Bread," and with reference to the quality of Vancouver Island coal quotes Professor E. T. Hodge, who said that of Canada's coal reserves British Columbia has the best as well as the most of it.

The strictures to which objection is taken read in part as follows:

"Take, for instance, the price of coal in this City (Vancouver). We are forty miles from the pit mouth by water. Coal is transported on scows towed by tugs, the very cheapest form of coal transportation. Yet run of mine coal, composed of a large proportion of worthless slack and other rubbish, costs as much per ton in Vancouver as the finest Pennsylvania anthracite coal, washed and screened, costs in Toronto after being transported by rail several hundred miles from the mines. I should judge a ton of this kind of coal supplied in Toronto will generate fifty per cent more heat than the stuff which clogs our pipes with soot and our grates with clinkers. If there was an honest intention in right quarters, Vancouver's coal bills would be reduced by at least 25 per cent. pronto. Apparently there is no intention, honest or otherwise, of anyone in authority making an inquiry into the oppressive coal prices of this city. Were Vancouver afflicted with an Ontario climate our coal situation would be little short of desperate, as indeed it has been at times, and that with millions of tons of coal within forty miles of the city."

Copper Smelting.

The Vancouver Chamber of Mines announces that its winter series of lectures on mining has been inaugurated, the first having taken place on the 7th of January, when Prof. Turnbull, of the University of British Columbia, delivered a lecture on "Copper Smelting."

PLATINUM AT FRANKLIN CAMP, B.C.

The establishment recently of the fact that there is platinum bearing mineral in the Franklin Camp, near Grand Forks, B.C., has caused a flutter of interest in British Columbia mining circles. Mr. William Thomlinson, ore sampler for the Canadian Munition Resources Commission, spent some time in that district late last summer and his report, which has just been published, is accepted by some as indicating that prospectors are close on the trail of the source of the platinum which has been found in the placer ground of the Tulameen River.

Mr. Thomlinson states that he is authorised to make public the following information regarding the tests for platinum made on the material taken by himself, during the month of September last, from mineral claims situated on the so-called "black lead" in Franklin Camp, Grand Forks Mining Division. He proceeds:

"Early in the month of August I visited Franklin Camp and took samples from the various workings on the "Maple Leaf" mineral claim, and sent the samples to the Dominion Assay Office at Vancouver to be assayed for platinum. Two of the samples from the "Maple Leaf" claim taken from an open cut from which two cars of copper ore had been shipped were found to contain, respectively, 0.15 oz. and 0.17 oz. of platinum per ton, and the results appears to me to indicate that the platinum content of the ore was roughly proportionate to the amount of the primary copper minerals, especially chalcopyrite, showing in the ore.

"Later Mr. J. J. O'Neil, of the Dominion Geological Survey, visited the "Maple Leaf" Claim with me, and being interested in the mode of occurrence of the platinum took a sample of almost pure chalcopyrite, occurring as a small lense in the pyroxenite, and has the sample assayed for platinum at the Dominion Assay Office at Vancouver. This sample showed a content of 0.38 oz. platinum a ton.

"The mineral bearings gangue on the "Maple Leaf" claim is mainly pyroxenite, with some tongues or inclusions of augite-syenite on the hanging wall side of the lode, and the copper minerals, principally chalcopyrite, occur in bunches and veinlets and as disseminated specks, throughout the pyroxenite and the syenite.

"Owing to good results from the Maple Leaf samples and noting that the pyroxenite zone or so-called "Black Lead" extends almost entirely across Franklin Camp, I visited and sampled all the principal properties situate on the pyroxenite-syenite contact zone. On most of the claims so situated the lode material appeared to be barren of economic minerals; but on several of the claims there could be seen at or near contacts a tendency for the copper or iron sulphides to form mineralized belts or masses. Most of my samples were taken from places where such segregations of copper and iron sulphides occurred and especially from where the copper-bearing minerals were in evidence; although the oxides and sulphides of iron were also included in the samples.

"Although most of the samples taken, on being assayed, showed appreciable amounts of platinum, it cannot yet be stated with certainty that more than very small portions of the "Black Lead" or pyroxenite belt can be mined on a commercial basis.

"In the samples assayed there appeared to be certain proportions between the copper-bearing minerals present and the platinum and the platinum contents; but at the "Mountain Lion" claim the platinum appears to be entirely associated with sulphides and oxides of iron.

"Whether the platinum occurs as native platinum or as sperrylite, the arsenide of platinum, has not yet been determined; but, I presume, it may be in the latter form, and associated with the sulphides and oxides of copper and iron where they are found segregated in the pyroxenite zone.

"On several properties, such as the "Gloucester" M.C., situate near to and on the dip of the pyroxenite zone, platinum may also be found to be associated with the sulphide ores; and, perhaps, it may be advisable to have all the ores of the entire camp tested for the metals of the platinum group.

"There is, however, much yet to be learned regarding the mode of occurrence of the platinum, and as to the average values of the material forming the so-called "Black Lead."

"It is probable that only certain portions of the pyroxenite zone contains platinum, copper or other metals in economic amounts; therefore much further investigation may be required, but I certainly consider the matter worthy of detailed research on the part of the Government or of the large mining corporations.

"Samples of the undernamed properties contained platinum as follows:

- "Maple Leaf," 3 samples, 0.15, 0.17, and 0.38 ozs.
- "Tucky Jack," 3 samples, 0.04, 0.06, and 0.08 ozs.
- "Mountain Lion," 2 samples, 0.09 and 0.09 ozs.
- "Golden Age," 1 sample, 0.06 ozs.
- "Averill Gp," 2 samples, 0.09 and 0.09 ozs.
- "Buffalo," 2 samples, 0.08 and 0.19 ozs.
- "Ottawa," 1 sample, 0.06 oz.
- "Columbia," 1 sample, 0.04 oz."

Metal Output Order, \$1,000,000 a Month at Trail.

During the calendar year of 1918, according to a statement given out by local officials, the value of the metals smelted or refined by the Consolidated Mining and Smelting Company, Ltd., at Trail, B.C., was approximately \$12,676,247 (the figures for the month of December being estimated) or over \$1,000,000 a month. Lead was the leader with a value of \$3,500,000; spelter next being valued at \$3,023,290; and the others followed. Some 75 tons of lead piping were made valued at \$15,000.

Appended are the detailed figures:

Lead (Lbs.)	40,662,704	\$3,537,655
Spelter. (Lbs.)	25,453,797	3,023,290
Copper (Lbs.)	9,951,781	2,557,000
Gold (Ozs.)	72,205	1,444,000
Silver (Ozs.)	2,088,331	2,000,476
Sulphuric acid (Tons)	3,926	98,150
Bluestone (Lbs.)	174,178	15,676
		\$12,676,247

Many Arrays for Platinum Made.

A comparative statement of the gold bullion deposited at the Dominion of Canada Assay Office, Vancouver, B.C., shows that the year 1918 established a new record for that centre. The value of the gold bullion deposited was \$4,080,184. In 1917 it was \$3,257,220, and in 1916 \$2,828,239. The increase in 1918 over 1917 was \$822,964, and the increase in 1918 over 1916 was \$1,251,945. During the latter part of the season 189 assays of platinum-bearing ores and sands were made and 77 deposits of platinum metals received. The purchase of platinum metals has been discontinued, but assays of platinum-bearing ores and sands will be continued to be made.

Accommodation is being made for the accommodation of about 150 men at Copper Mountain by the Consolidated Mining & Smelting Company. This work is

understood to be preliminary to the commencement of extensive development of the property known as Voight's Claims, which have been taken over by the Consolidated Company. This property adjoins that of the the Canada Copper Corporation, near Princeton, B.C., on which extensive work has been under way for several years, and which soon will be in shape for operation on a large scale.

Mining in Northern Manitoba.

The northwestern district of the Province of Manitoba is attracting some attention as a copper producer. The Mandy Company, which is a Canadian organization of a Tonapah, Nevada, firm, has had an output during the past year of about 9,000 tons of high grade copper ore. The property now is in shape, it is stated, to produce 20,000 tons in 1919, but whether this will be done in view of the present uncertain prospect in regard to the market is a question. In the same region, according to reliable report, diamond drill has been under way on low grade copper deposits with the result that some 2,000,000 tons have been blocked out. Transportation has been and still is somewhat of a problem. The ore which thus far has been shipped has gone to the Trail (B.C.) smelter. Realizing that the industry cannot stand so long a haul the company is planning to instal a smelter and build a railway giving connection with one of the main line Canadian railways.

Increased production of gold from Ontario Mines—

This week comes the important announcement that the directors of the Porcupine Crown Mine have decided to re-open the mine. This is one of the most hopeful signs for the gold district. From this date forward the idle mines may reasonably be expected to begin operations, and that within the next few months every gold mine of importance in the country will be operating at full blast. The next three former producing mines in line for resumption of production before very long are the Schumacher, the Dome and the Porcupine V. N. T. In the Kirkland Lake and Boston Creek districts activity is also increasing. During the month of December the Lake Shore Mine produced a greater quantity of gold than in any previous month in its history. In the Boston Creek districts, the Miller Independence has definitely arranged for deep mining, and is assuming ever larger proportions.

Will Examine Resources of Greenwood District.

Citizens of Greenwood, B.C., are doing everything within their power to keep the smelter of the Canada Copper Corporation, which was closed down recently, in that district and to make such arrangements as will result in its operation. They have faith in the mineral resources of that part of British Columbia; they believe that the mineral necessary to keep the smelter active exists in that vicinity and that it can be found; and they are not going to allow the smelter either to stand idle or be removed if anything within their power can prevent it. Hon. Wm. Sloan, Minister of Mines, has agreed after listening to their representations, that two of the Government Mining Engineers shall make an investigation of the conditions as to the ore resources of the Greenwood District, and submit reports at the earliest possible moment. The Citizens' Committee hope that these reports will justify their confidence and that it will be found practicable, in a commercial sense, to continue the smelter, which, of course, is the heart and the mainstay of the community of Greenwood.

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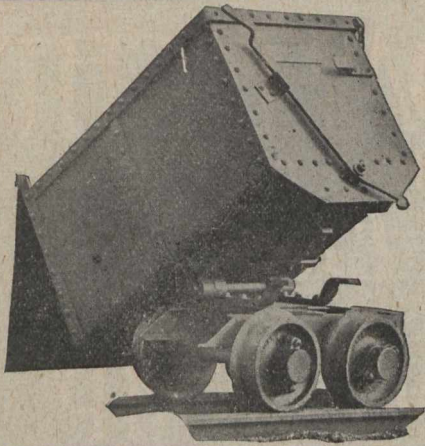
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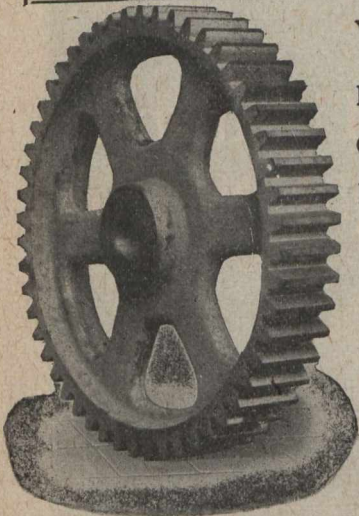
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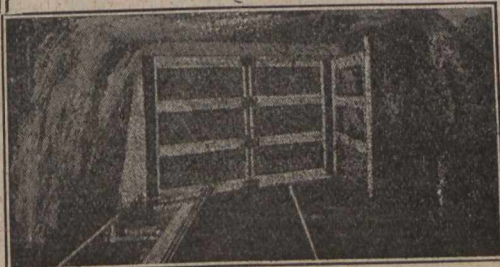
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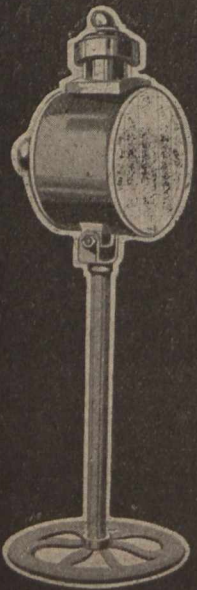
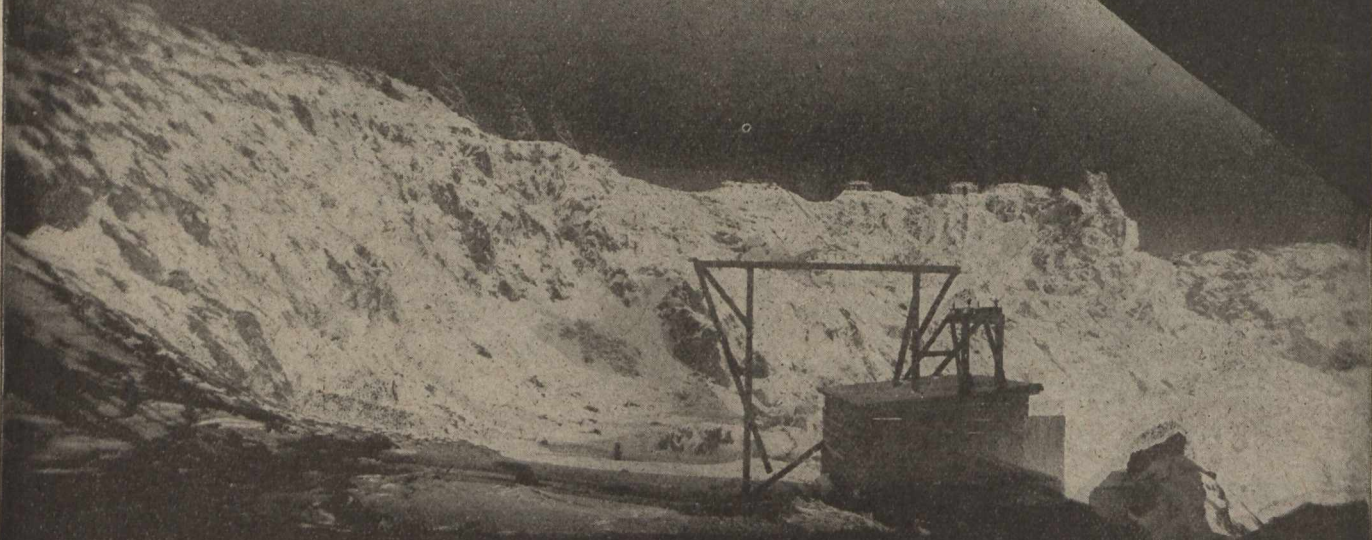
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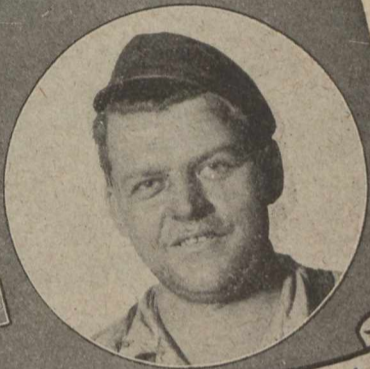
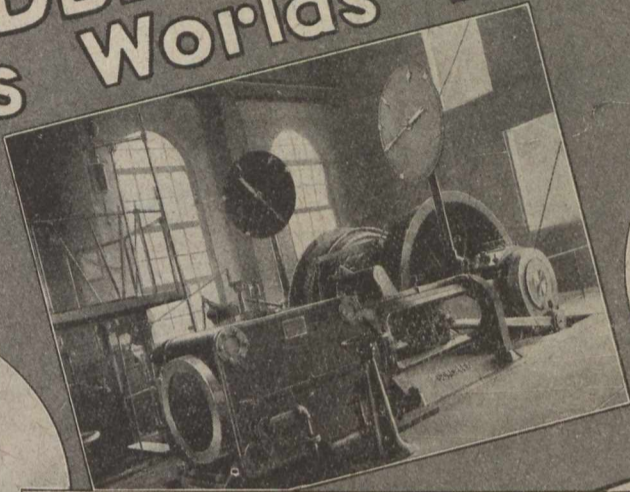
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HARRISON 2860

Mr. H. W. Dow, Sales Manager,
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My dear Mr. Dow:-

Last December I wrote you regarding the performance of the 28" and 28" by 48" Nordberg hoisting engine at our Orient #1 Mine after the new cylindrical drum had been installed. From your interest at that time I think you would like to hear that our prediction of even better results has been realized.

Last week this Mine established a brand new hoisting record, Thursday recording the largest single day's output we have heard of for any coal mine and the week's average being higher than any single day's output for any other mine in the Southern Illinois field. The coal hoisted, prepared and loaded for shipment was -

Monday, October 7th,	4928 tons
Tuesday, " 8th,	5237 "
Wednesday, " 9th,	5482 "
Thursday, " 10th,	6008 "
Friday, " 11th,	5355 "
Saturday, " 12th,	5504 "

Total for week, 32,514 tons

Average per day 5,419 tons

The coal lies 520 feet below the surface, the hoisting distance from bottom of shaft to dumping point being about 600 feet. To raise the 6008 tons on Thursday it was necessary to make 1452 hoists or an average of 181 1/2 hoists per hour, or better than 3 per minute - the pit cars averaging a little better than 4 tons of coal each. Single car, self-dumping cages.

This was remarkable hoisting, the output being very largely due to the fine action of the hoist itself which has greatly increased the capacity of this shaft.

With best regards,

Yours very truly,

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

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

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

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

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

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

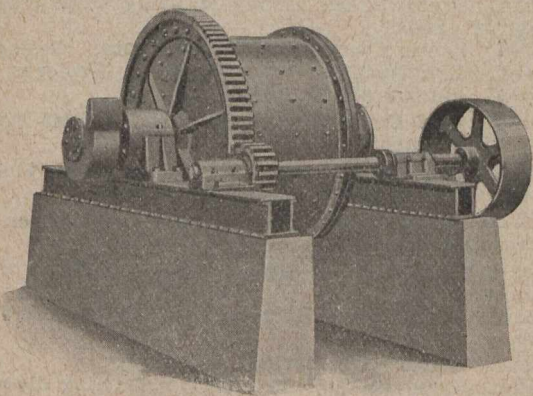
MINING CONCESSION. Notwithstanding the above, a mining concession may be acquired at any time at the rate of \$5 an acre for **SUPERIOR METALS**, and \$3 an acre for **INFERIOR MINERALS**

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

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

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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, 1916.

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, 1917, Part D. Reports on field work in Manitoba.

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

Memoir 96. Sooke and Duncan Map-areas, Vancouver Island, by C. H. Clapp.

Memoir 98. Magnesite Deposits of Grenville District, Argenteuil County, Quebec, by M. E. Wilson.

Memoir 99. Road material surveys in 1915, by L. Reinecke

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

Memoir 103. Timiskaming County, Quebec, by M. E. Wilson.

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

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

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

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

Map 145A. Timiskaming county, Quebec. Geology.

Map 154A. Southwestern Yukon.

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

Map 161A. Beaverton Sheet, Ontario, York and Victoria Counties, Ontario. Topography.

Map 162A. Sutton Sheet, York and Simcoe Counties, Ontario. Topography.

Map 163A. Barrie sheet, Simcoe County, Ontario. Topography.

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

Map 174A. Blairmore, Alberta. Topography.

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

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

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

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

Map 1702. Klotassin, Yukon Territory. Geology.

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

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

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.



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- Derricks—**
Smart-Turner Machine Co. M. Beatty & Sons, Ltd. Marsh Engineering Works.
- Diamond Drill Contractors—**
Diamond Drill Contracting Co. Smith & Travers. Sullivan Machinery Co.
- Dredger Pins—**
Hadfields Ltd.
- Dredging Machinery—**
M. Beatty & Sons. Hadfields Ltd.
- Dredging Ropes—**
Allan, Whyte & Co.
- Drills, Air and Hammer—**
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que. Sullivan Machinery Co. Northern Canada Supply Co. Canadian Rock Drill Co.
- Drills—Core—**
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que. Standard Diamond Drill Co. Sullivan Machinery Co.
- Drills—Diamond—**
Sullivan Machinery Co. Northern Canada Supply Co.
- Drill Steel—Mining—**
Hadfields Ltd.
- Drill Steel Sharpeners—**
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que. Northern Canada Supply Co. Sullivan Machinery Co. Canadian Rock Drill Co.
- Drills—Electric—**
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que. Sullivan Machinery Co.
- Drills—High Speed and Carbon—**
Hadfields Ltd.
- Dynamite—**
Canadian Explosives. Northern Canada Supply Co.
- Ejectors—**
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que. Northern Canada Supply Co.
- Elevators—**
M. Beatty & Sons. Sullivan Machinery Co. Northern Canada Supply Co. Hadfields Ltd.
- Engineering Instruments—**
C. L. Berger & Sons.
- Engines—Automatic—**
Smart-Turner Machine Co.
- Engines—Gas and Gasoline—**
Alex. Fleck. Sullivan Machinery Co. Smart-Turner Machine Co. Gould, Shapley & Muir Co., Ltd.
- Engines—Haulage—**
Canadian Ingersoll-Rand Co. Ltd., Montreal, Que. Marsh Engineering Works.
- Engines—Marine—**
Smart-Turner Machine Co.
- Engines—Steam—**
Smart-Turner Machine Co. M. Beatty & Sons.
- Forges—**
Northern Canada Supply Co., Ltd.
- Forging—**
M. Beatty & Sons. Smart Turner Machine Co. Hadfields Ltd.
- Furnaces—Assay—**
Lymans, Ltd. Mine & Smelter Supply Co.
- Fuse—**
Canadian Explosives. Northern Canada Supply Co.
- Gears, Cut—**
The Hamilton Gear and Machine Co.
- Gears, Cast—**
The Hamilton Gear and Machine Co.
- Gears—**
Smart-Turner Machine Co. Northern Canada Supply Co. The Hamilton Gear and Machine Co.
- Hammer Rock Drills—**
Mussels, Limited.
- Hangers—Cable—**
Standard Underground Cable Co. of Canada, Ltd.
- High Speed Steel—**
Hadfields Ltd.
- High Speed Steel Twist Drills**
Northern Canada Supply Co.
- Hoists—Air, Electric and Steam—**
Can. Ingersoll-Rand Co., Ltd., Montreal, Que. Jones & Glassco. M. Beatty & Sons. Marsh Engineering Works. Northern Canada Supply Co. Mine and Smelter Supply Co.
- Hoisting Engines—**
Mussels, Limited. Sullivan Machinery Co. Can. Ingersoll-Rand Co., Ltd. M. Beatty & Sons. Marsh Engineering Works.
- Hose—**
Northern Canada Supply Co.
- Hydraulic Machinery—**
Hadfields Ltd.
- Ingot Copper—**
Canada Metal Co., Ltd. Hoyt Metal Co.
- Insulating Compounds—**
Standard Underground Cable Co. of Canada, Ltd.
- Jacks—**
Can. Ingersoll-Rand Co., Ltd., Montreal, Que. Can. Brakeshoe Co., Ltd. Northern Canada Supply Co.
- Laboratory Machinery—**
Mine & Smelter Supply Co.
- Lamps, Miners—**
Dewar Mfg. Co., Inc.
- Locomotives (Steam, Compressed Air and Storage Steam)—**
H. K. Porter Company.
- Link Belt—**
Northern Canada Supply Co. Jones & Glassco.
- Manganese Steel—**
Hadfields Ltd.
- Metal Merchants—**
Henry Bath & Son. Geo. G. Blackwell, Sons Co. Consolidated Mining and Smelting Co. of Canada. Canada Metal Co. C. L. Constant Co. Everitt & Co.
- Mining Requisites—**
Hadfields Ltd.
- Monel Metal—**
International Nickel Co.
- Nickel—**
International Nickel Co.
- Ore Sacks—**
Northern Canada Supply Co.
- Ore Testing Works—**
Ledoux & Co. Can. Laboratories. Milton Hersey Co., Ltd. Campbell & Deyell. Hoyt Metal Co.
- Ores and Metals—Buyers and Sellers of—**
C. L. Constant Co. Geo. G. Blackwell. Consolidated Mining and Smelting Co. of Canada. Orford Copper Co. Canada Metal Co. Hoyt Metal Co. Everitt & Co.
- Perforated Metals—**
Northern Canada Supply Co. Hendrick Mfg. Co.
- Pig Tin—**
Canada Metal Co., Ltd. Hoyt Metal Co.
- Pig Lead—**
Canada Metal Co., Ltd. Hoyt Metal Co.

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Pipes— Canada Metal Co., Ltd. Consolidated M. & S. Co. Northern Canada Supply Co. Smart-Turner Machine Co.	Pumps—Pneumatic— Smart-Turner Machine Co. Can. Ingersoll-Rand Co., Ltd. Sullivan Machinery Co.	Screens—Cross Patent Flanged Lip— Hendrick Mfg. Co.	Tanks—Cyanide, Etc.— Hendrick Mfg. Co. Pacific Coast Pipe Co., Ltd. MacKinnon Steel Co.
Pipe—Wood Stave— Pacific Coast Pipe Co., Ltd. Mine and Smelter Supply Co.	Pumps—Steam— Can. Ingersoll-Rand Co., Ltd. Mussens, Limited. Northern Canada Supply Co. Smart-Turner Machine Co.	Separators— Smart-Turner Machine Co.	Tanks (water) and Steel Towers— Gould, Shapley & Muir Co., Ltd. MacKinnon Steel Co.
Piston Rock Drills— Mussens, Limited.	Pumps—Turbine— Smart-Turner Machine Co. Can. Ingersoll-Rand Co., Ltd.	Sheet Lead— Canada Metal Co., Ltd.	Tramway Points and Crossings— Hadfields Ltd.
Pneumatic Tools— Can. Ingersoll-Rand Co., Ltd. Jones & Glasco.	Pumps—Vacuum— Smart-Turner Machine Co.	Shovels—Steam— M. Beatty & Sons.	Transits— C. L. Berger & Sons.
Prospecting Mills and Machinery— Standard Diamond Drill Co. Mine & Smelter Supply Co.	Quarrying Machinery— Sullivan Machinery Co. Can. Ingersoll-Rand Co., Ltd. Hadfields Ltd.	Smoke Stacks— Hendrick Mfg. Co. MacKinnon Steel Co., Ltd. Marsh Engineering Works.	Tubs— Hadfields Ltd.
Pulleys, Shafting and Hangings— Northern Canada Supply Co.	Rails— Hadfields Ltd.	Steel Barrels— Smart-Turner Machine Co.	Welding Rod and Flux— Imperial Brass Mfg. Co.
Pulverizers—Laboratory— Mine & Smelter Supply Co.	Roofing— Northern Canada Supply Co.	Steel Castings— Can. Brakeshoe Co., Ltd. Hadfields Ltd.	Welding and Cutting, Oxy-Acetylene— Imperial Brass Mfg. Co.
Pumps—Boiler Feed— Smart-Turner Machine Co. Northern Canada Supply Co. Can. Ingersoll-Rand Co., Ltd.	Rope—Manilla and Jute— Jones & Glasco. Northern Canada Supply Co. Allan, Whyte & Co.	Steel Drills— Sullivan Machinery Co. Northern Canada Supply Co. Can. Ingersoll-Rand Co., Ltd.	Wheels and Axles— Hadfields Ltd.
Pumps—Centrifugal— Mussens, Limited. Smart-Turner Machine Co. M. Beatty & Sons. Can. Ingersoll-Rand Co., Ltd. Mine & Smelter Supply Co.	Rope—Wire— Allan, Whyte & Co. Northern Canada Supply Co.	Stone Breakers— Hadfields Ltd.	Winding Engines—Steam and Electric— Can. Ingersoll-Rand Co., Ltd. Marsh Engineering Works.
Pumps—Electric— Smart-Turner Machine Co. Can. Ingersoll-Rand Co., Ltd.	Rolls—Crushing— Hadfields Ltd.	Surveying Instruments— C. L. Berger.	Wire Cloth— Northern Canada Supply Co. B. Greening Wire Co., Ltd.
Pumps—Sand and Slime— Mine & Smelter Supply Co.	Samplers— C. L. Constant Co. Ledoux & Co. Milton Hersey Co. Thos. Heys & Son. Mine & Smelter Supply Co.	Tables—Concentrating— Mine & Smelter Supply Co.	Wire (Bare and Insulated)— Standard Underground Cable Co., of Canada, Ltd.
	Screens— Northern Canada Supply Co. Hendrick Mfg. Co. Hadfields Ltd.	Tanks (Wooden)— Gould, Shapley & Muir Co., Ltd. Pacific Coast Pipe Co., Ltd.	Zinc Spelter— Canada Metal Co., Ltd. Hoyt Metal Co.

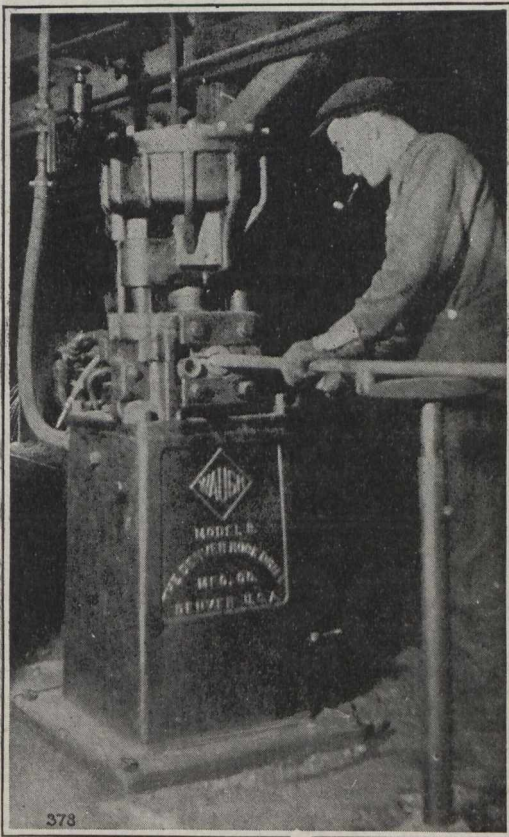
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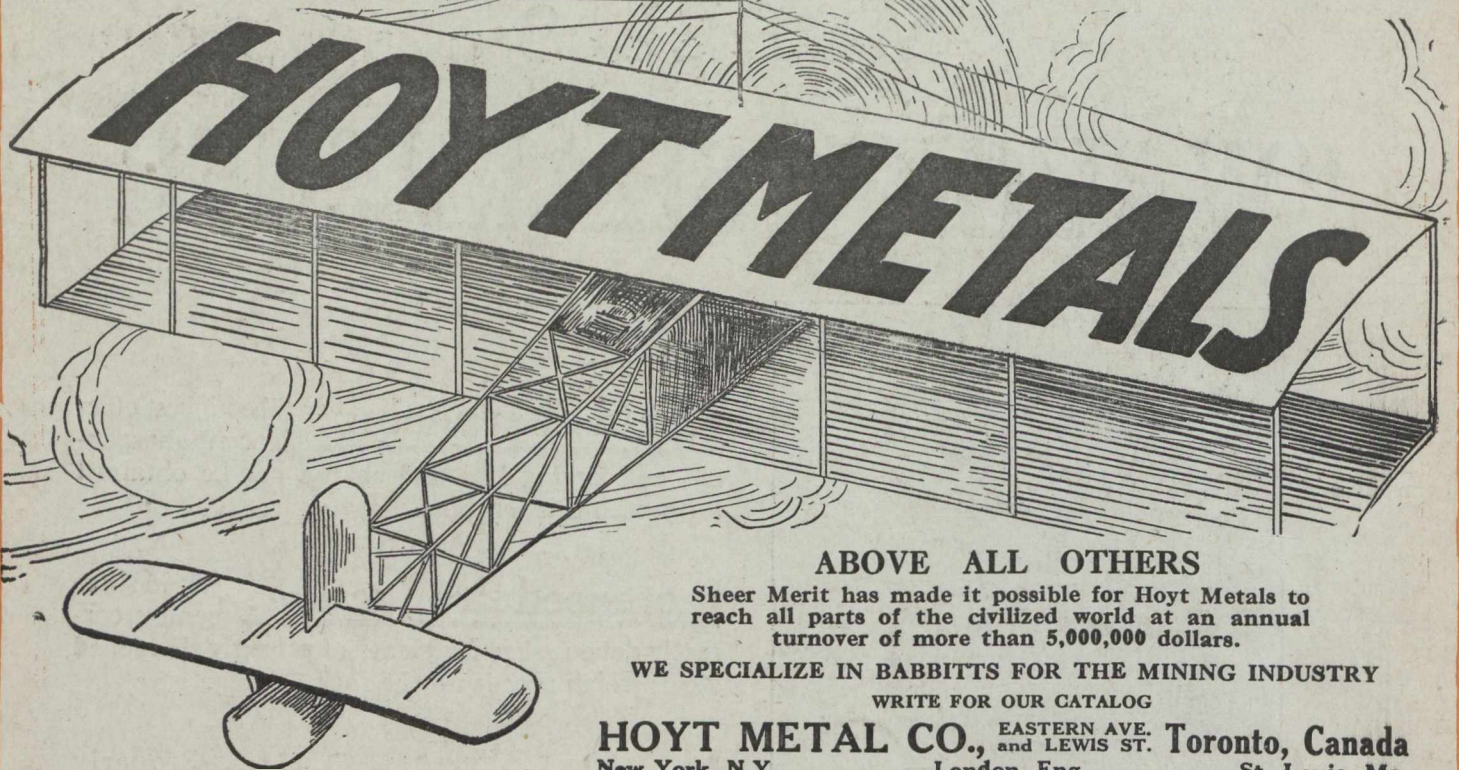
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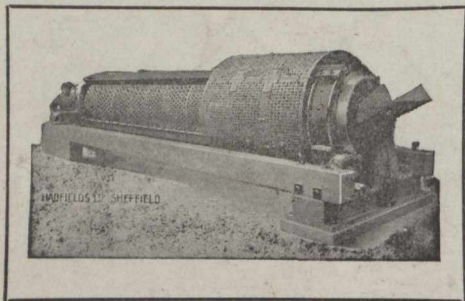
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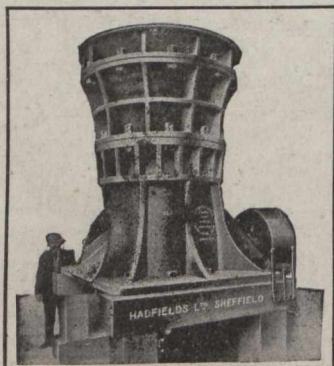
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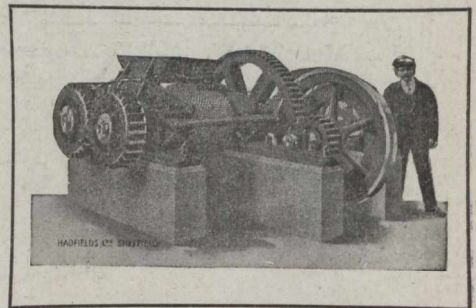
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