



# CANADA

## DEPARTMENT OF MINES

HON. E. L. PATENAUDE, Minister.

R. G. McCONNELL, Deputy Minister.

### MINES BRANCH

#### Recent Publications

- The Nickel Industry: with special reference to the Sudbury region, Ont. Report on, by Professor A. P. Coleman, Ph.D.
- The Copper Smelting Industry of Canada. Report on, by A. W. G. Wilson, Ph.D.
- Building and Ornamental Stones of Canada (Quebec). Vol. III. Report on, by W. A. Parks, Ph.D.
- The Bituminous Sands of Northern Alberta. Report on, by S. C. Ells, M.E.
- 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 Report of the Mineral Production of Canada During the Calendar Year 1914 by John McLeish, B.A.
- The Petroleum and Natural Gas Resources of Canada: Vols. I. and II., by F. G. Clapp, M.A., and others.
- The Salt Industry of Canada. Report on, by L. H. Cole, B.Sc.
- Electro-plating with Cobalt. Report on, by H. T. Kalmus, Ph.D.
- Electro-thermic Smelting of Iron Ores in Sweden. Report on, by A. Stansfield, D.Sc.
- Non-metallic Minerals Used in Canadian Manufacturing Industries. Report on, by H. Frechette, M.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.

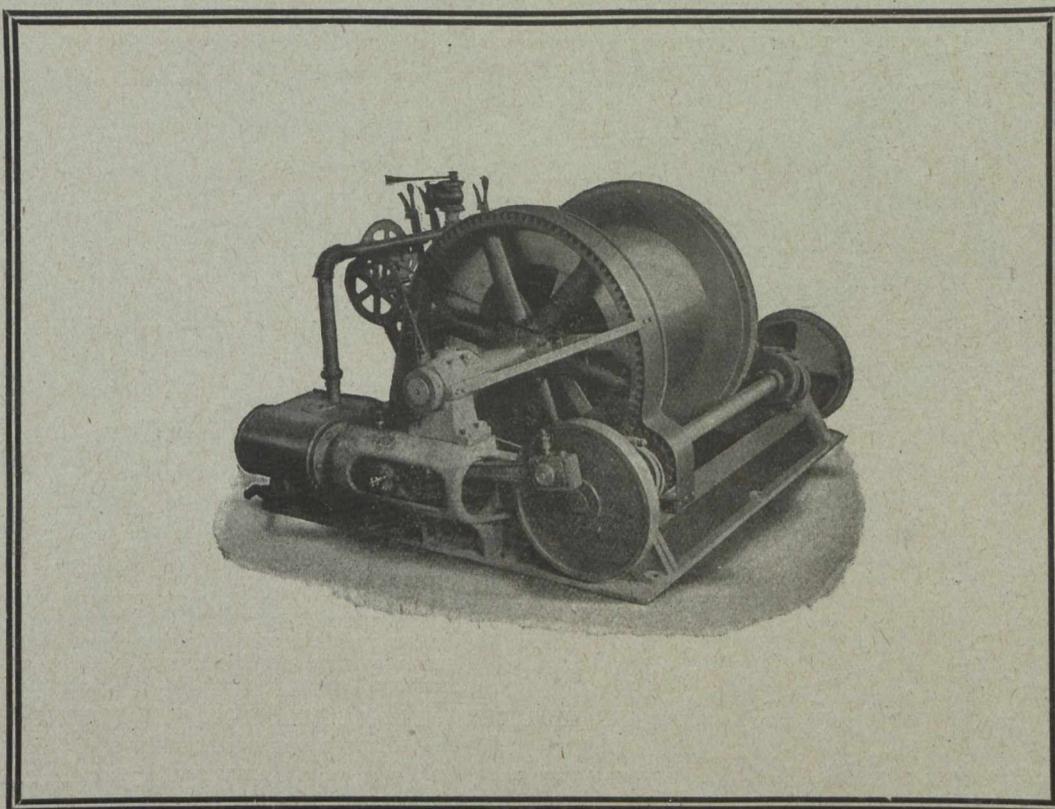
**Structural Materials Laboratory.**—Experimental work on sands, cements and limes is also undertaken.

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

- Memoir 64. Preliminary Report on the Clay and Shale Deposits of the Province of Quebec, by J. Keele.
- Memoir 74. A List of Canadian Mineral Occurrences, by Robert A. A. Johnston.
- Memoir 77. Geology and Ore Deposits of Rossland, British Columbia, by C. W. Drysdale.
- Memoir 82. Rainy River District of Ontario. Surficial Geology and Soils, by W. A. Johnston.
- Memoir 84. An Exploration of the Tazin and Taltson Rivers, Northwest Territory, by Charles Camsell.
- Memoir 85. Road Material Surveys in 1914, by L. Reinecke.
- Memoir 87. Geology of a Portion of the Flathead Coal Area, British Columbia, by J. D. Mackenzie.
- Memoir 88. Geology of Graham Island, British Columbia, by J. D. Mackenzie.
- Memoir 89. Wood Mountain-Willowbunch Coal Area, Saskatchewan, by Bruce Rose.
- Memoir 92. Part of the District of Lake St. John, Quebec, by John A. Dresser.
- Memoir 93. The Southern Plains of Alberta, by D. B. Dowling.
- Memoir 94. Ymir Mining Camp, British Columbia, by Charles Wales Drysdale.
- Memoir 95. Onaping Map-Area, by W. H. Collins.
- Map 59A. Wheaton, Yukon Territory.
- Map 60A. Wheaton, Yukon.
- Map 67A. Kirkfield Sheet, Victoria County, Ontario.
- Map 150A. Ponhook Lake Sheet, Nova Scotia.
- Map 175A. Ymir, Kootenay, British Columbia.
- Map 176A. Graham Island, Queen Charlotte Islands, British Columbia.
- Map 177A. Southern Portion of Graham Island, Queen Charlotte Islands, British Columbia.
- Map 180A. Espanola Area, Sudbury District, Ontario.
- Map 184A. Roberval, Lake St. John County, Quebec.
- Map 187A. Southern Plains of Alberta.
- 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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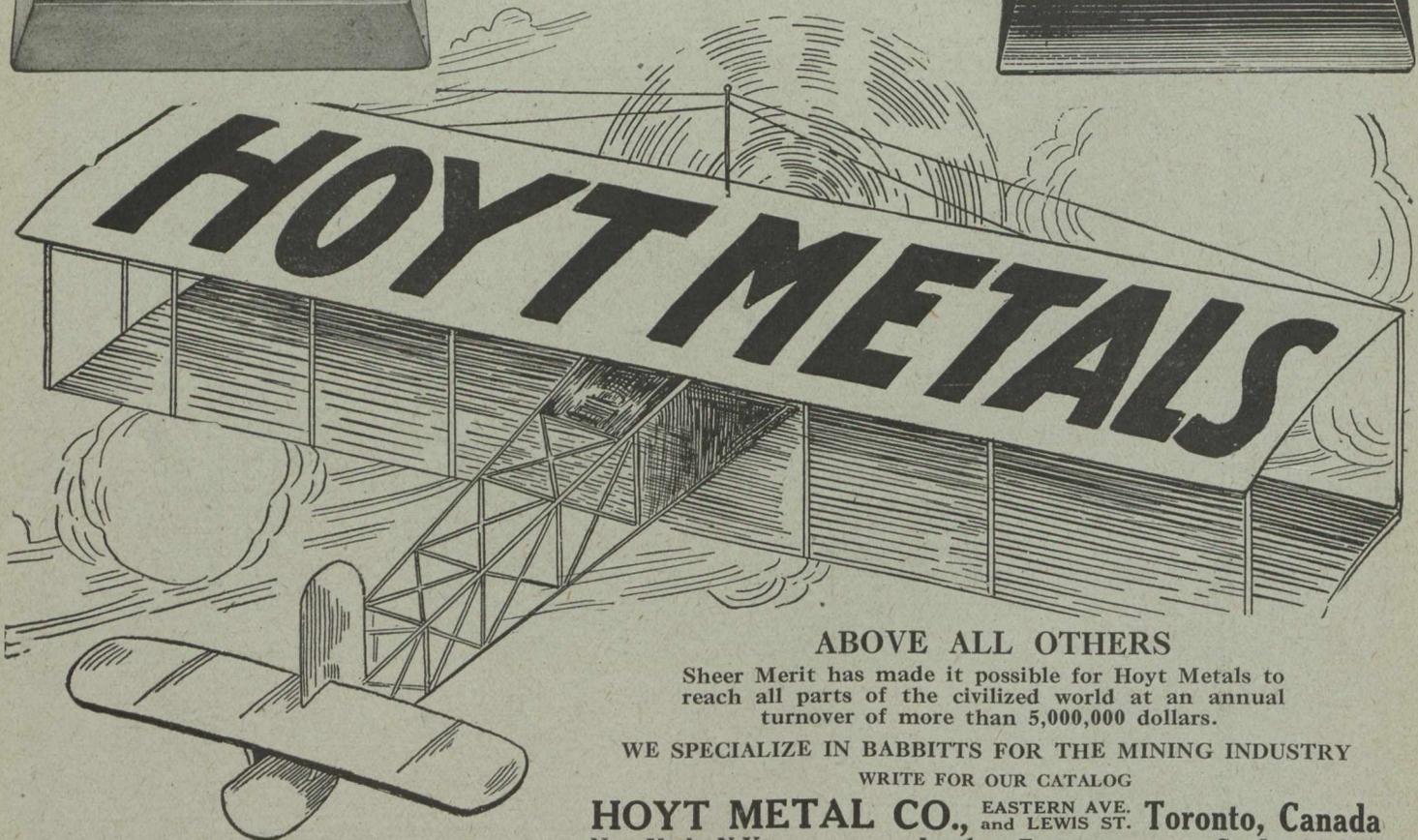
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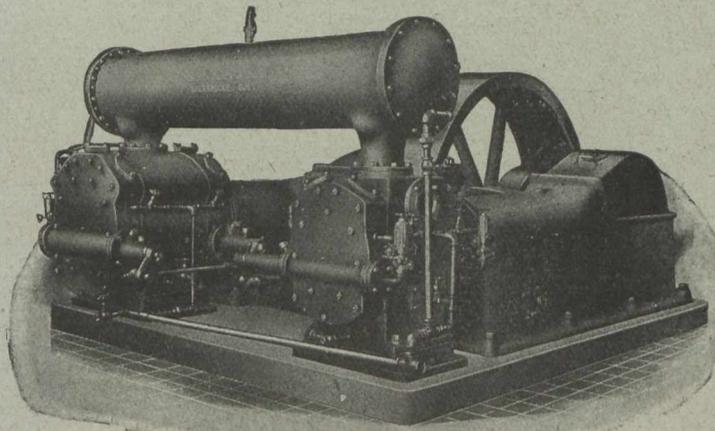
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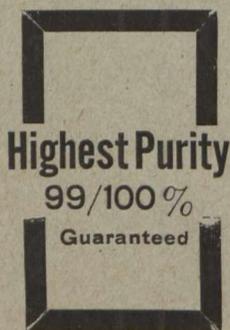
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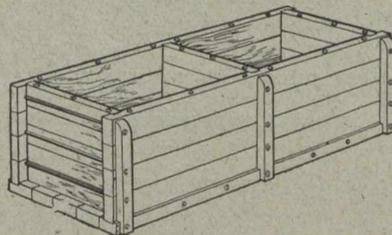
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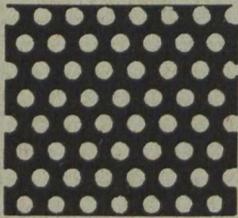
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**Iron** The province contains numerous districts in which occur various varieties of iron ore, practically at tide water and in touch with vast bodies of fluxes. Deposits of particularly high grade manganese ore occur at a number of different locations.

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**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.

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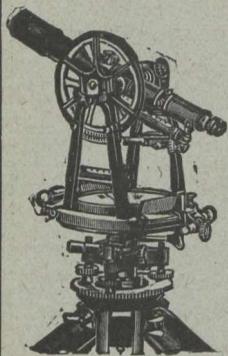
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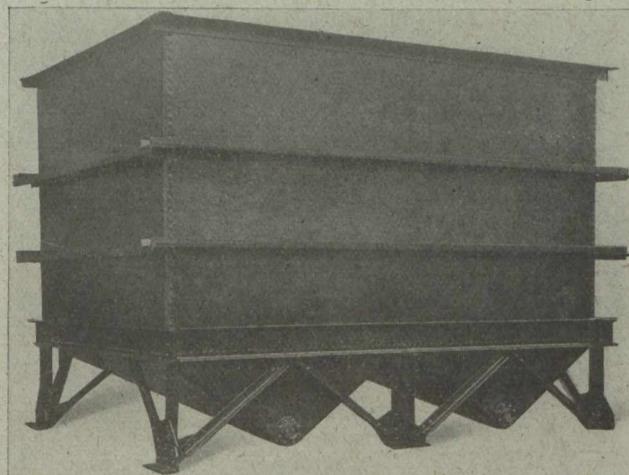
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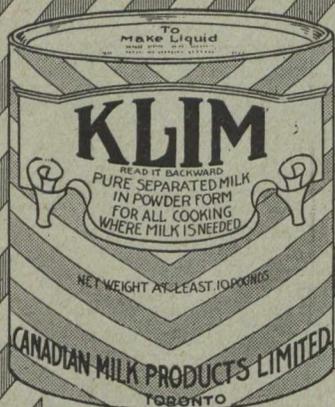
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# THE CANADIAN MINING JOURNAL

VOL. XXXVIII.

TORONTO, July 15th, 1917.

No. 14

## The Canadian Mining Journal

With which is incorporated the  
"CANADIAN MINING REVIEW"

Devoted to Mining, Metallurgy and Allied Industries in Canada.

Published fortnightly by the

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### CIRCULATION

"Entered as second-class matter April 23rd, 1908, at the post office at Buffalo, N.Y., under the Act of Congress of March 3rd 1879."

### CONTENTS.

Editorials—	Page
Development of Resources.....	283
The Need of a Minister of Mines.....	283
Correspondence—	
The Phosphate Discussion .....	284
The Dome Report .....	284
On Independent Reports .....	284
The Enrichment of Ore Deposits, by W. G. M.....	286
Field Work of the Geological Survey during 1917.....	286
Smelter Smoke Damages .....	288
Dividends from Northern Ontario Gold and Silver Mines.	289
The Rockwood Anticline, by M. Y. Williams.....	290
Application of the Flotation Process.....	294
Personal and General .....	296
Special Correspondence .....	297
Coal and Coke Production, Imports and Exports.....	300
Markets.....	301

### DEVELOPMENT OF RESOURCES.

We reprint in this issue from the "Financial Times," London, accounts of the establishment in London of an Imperial Mineral Resources Bureau and the proposed formation of an Imperial Development Board. Such accounts indicate that there are people in England who are alive to the desirability of encouraging development of the mineral resources of the Empire.

Recognition of the necessity of developing basic industries has been more general throughout the Empire during the past two years. In Canada recognition of the fact has however not been followed by as much organized effort as is desirable. It is true that much has been accomplished by various groups of men; new industries have been established and a better and more accessible inventory of our resources is being made. But Canadians should be considering more seriously the future development of our mineral resources. We should be more actively engaged in determining what our resources are and in developing them. We should aim to supply the Empire with a much larger portion of the minerals it needs.

The establishment of an Imperial Mineral Resources Bureau in London affords Canada an opportunity of informing citizens of the Empire concerning our resources. Should we not consider this as an opening that should be eagerly seized? The success of the Bureau insofar as Canada is concerned will not depend so much on the initiative of those in London as on the ability of Canadians to keep the Bureau informed on Canada. Should we not see to it that we are ably represented on the Bureau and that we vigorously support our representatives? What are we going to do about it?

### THE NEED OF A MINISTER OF MINES.

It is obvious that if Canada is to take its proper place in the Empire as a producer of minerals we must have government recognition of the fact that mining is one of Canada's chief industries. We must have a strong Mines Department and a real Minister of Mines. We have long since passed the stage when the portfolio of Minister of Mines could properly be held by the holder of any other portfolio.

It is well known that our Mines Department does a great deal of useful work; that many well trained technical men are on its staff and that these men are faithfully discharging their duties. It is, however, just as well known that our governments choose to ignore the Department of Mines. The men chosen to be Ministers of Mines are not expected by the government to devote serious attention to the Department. Half the time few of those interested in mining know who is Minister of Mines of Canada. A natural result of the present system is that the Ministers of Mines are content to do the routine work of the De-

partment. They have other work which they evidently regard as of greater importance than the development of our resources. They cannot be expected to lead in a campaign for quicker development and wider utilization of Canadian ores.

If we are to have recognition throughout the world as a mining country we should have recognition at Ottawa. To obtain recognition at Ottawa we apparently need united effort on the part of those most directly concerned. Would it not be well for Boards or Trade in mining districts and the mining societies to press more strongly on members of parliament, and particularly on the Government, the inadequacy of the present system, and the good results that would come from devoting greater attention to organization for the development of resources?

### THE PHOSPHATE DISCUSSION.

It has been brought to our attention that in a reply published in our May 15 issue, to a letter by James White, we have made statements which should be retracted.

In the reply referred to, we said:

"The Commission, apparently in ignorance of the work which has been done, undertook the task of prospecting for phosphate and succeeded in finding a phosphate boulder near the geological horizon at which phosphate beds are known to occur in the western States. They gave out a statement to the daily press reporting their discovery.

"Mr. Ferrier, a former officer of the Geological Survey, noting the press report, went to Ottawa and advised one of the Commission's officers that he had carefully prospected the area in question and had discovered not only boulders but beds of phosphate there. He was able to advise this officer that the deposits had been carefully traced, sampled, analyzed and tested by concentration devices and found to be of no value. The beds are too thin and too low grade to be of commercial importance. Mr. Ferrier did not give this information out for publication; but doubtless hoped that the facts he presented would prevent rash statements being made by the Commission regarding the possibility of locating economic deposits of phosphate.

"Evidently, however, the Commission thought that the public would not think much of a report on the discovery of phosphate unless it were painted in glowing phrases, and the report issued contained no suggestion of the unpleasant facts.

"In view of the facts, Mr. White's denial of the warning given is an indication that he did not believe that the facts were known."

We regret that we have been unfair to the Commission and to Mr. Ferrier in making these statements. We therefore desire to retract them and to apologize to the Commission and to Mr. Ferrier.

### NEW GAS WELL.

Hamilton, July 4.—The National Gas Company has struck a well on the farm of William Pettigrew, Seneca, with a flow of 1,000,000 feet a day. James Dixon says the company will be in a position to supply considerable gas to householders. The well was found in an entirely new field.

## CORRESPONDENCE

### The Dome Report.

Editor Canadian Mining Journal:

Sir,—In your publication of July 1st, 1917, we note two articles referring to the Dome Mines Company, Limited, on which we wish to comment.

Under the heading "Development and Mining" in our annual report of March 31st, 1917, we distinctly state our estimate of ore reserves at that time, and also call the attention of our stockholders to the great difficulties under which we are at present laboring to keep up development work. We endeavored to show that, although, owing to a shortage of labor, actual ore deposits had not been proved to the point where we should feel justified in adding them to our estimated ore reserves, extensive diamond drilling indicated that our orebodies were intact at lower levels, and we believed we had discovered a new orebody below the seventh level of large extent. Under the section relating to "Diamond Drilling" operations in our report we gave detailed logs of the individual holes of consequence for the purpose of impressing upon our stockholders what may be expected when we are again able to obtain our full quota of miners and muckers and development can be resumed to the fullest capacity.

The totals given as estimated ore reserves contain only such blocks of ore as are customarily treated as ore reserves and consist of ore which has been proved, beyond any reasonable doubt, to be ore. They do not contain any orebodies which have been encountered in diamond drilling.

The labor shortage has caused not only curtailment of development but has also occasioned a rearrangement of operating conditions. With normal working units we are able to select our ore from different workings and thereby hold a uniform grade. Under present conditions, as it takes a certain tonnage to enable us to operate our mill economically, we are unable to choose; but must obtain ore from those workings which produce the largest tonnages according to the number of miners at work thereon, irrespective of grade. Consequently we are forced to draw heavily from our pits, the lowest grade ore in the mine.

Our directors feel that everything possible under the circumstances, has been done, and they feel convinced that if it had not been for the unusual shortage of labor the Dome Mines would have made a more favorable showing for the past fiscal year than for that previous.

Yours etc.

J. R. DELAMAR, President,  
The Dome Mines Company, Limited.

New York, July 9, 1917.

Editor, Canadian Mining Journal:

Sir,—As a regular subscriber I have read with a great deal of interest your articles headed "Independent Reports Needed" and "Estimation of Ore Reserves" in your publication of April 1st and July 1st, respectively. Having large financial interests in various mining companies for precious metals in Northern Ontario, I thoroughly approve of the spirit of your article and shall be glad if such a tendency is encouraged.

Knowing that I was one of the largest owners of shares in Temiskaming Mining Company, which, since the present management got control of the company three years ago, does not inform its stockholders of the amount of ore reserves, I spoke to the president of the company when I met him for the first time, in December, 1915, about ore reserves and was assured that I could get them estimated by an engineer of high repute any time I wish to at my expense. I owned at that time about 65,000 shares.

Various visits to the mine influenced me to increase my holdings to about 140,000 shares in October, 1916. After a visit to the mine at that time I felt seriously inclined to increase my holding of stock in the company very materially. I expressed my intentions to the president of the company then, and I also stated to him that I considered it advisable to accept his proposition made to me the previous December in regard to ore reserves, with the condition that the company get the report from the engineer and be permitted to publish it to all stockholders. I asked the president then to have my request for examination for ore reserves submitted to the board of directors for their assent at its next meeting with the understanding that I myself would bear the full expense of such a report if the company was not willing to share it.

Receiving no reply by November 21st, 1916, I wrote to the president on that day, requesting him for an answer, and also asked him to be good enough to suggest to me the name of an able engineer for the purpose. The reply dated December 1st, 1916, was as follows: "Regarding the selection of an engineer will say, that your request does not seem to meet with universal approval and as I pointed out to you it would mean quite a considerable expense to you as the company would not care to assume the same. What you desire I do not think could be accomplished inside of six weeks and would mean an engineer with several assistants. I had a similar request, as I told you, from another shareholder and when I pointed out these difficulties he quite approved of my position."

I replied on December 5th, requesting the president of the company to bring before the board of directors a reconsideration of my request for permission to have ore reserves estimated and mentioned the names of quite a few prominent engineers of the camp to make a selection from, although I had not spoken of this intention for estimating ore reserve to any of these well known engineers.

I received reply to this second request, dated December 7th, stating that my letter would be laid before the board of directors at the next meeting. Hearing nothing further on the subject I was compelled to assume by the silence that my request for estimating ore reserves had been refused again.

I have always considered the knowledge of positive ore reserves to be a very important factor to guide an investor as to the quality of his investment. All Cobalt companies who really have substantial ore reserves, with the exception of those two companies under the control by the identical same board of directors, viz., Temiskaming and Beaver, give this essential information to their shareholders in their annual reports. I know of many shareholders of the Temiskaming Company who are exceedingly anxious to get such information and they are really entitled to have it just as much as the management itself. I honestly believe that whenever such a report in detail will be issued to the shareholders, it will create a pleasant surprise for them.

This same management, which apparently refused me twice the right of having the ore reserves of the company estimated by an engineer of high standing, although aware of the fact that I was by far the largest owner of shares of the company, saw fit to propose to its shareholders a deal, as outlined in enclosed circular dated February 22nd, 1917, and asked for its approval. In order to protect my true interest in the company against acceptance of such an intensely objectionable proposition, I was compelled to apply at my own expense, unsolicited by anybody, to the court for an injunction against the holding of such special meeting after all effort of my solicitor, Mr. Glyn Osler, for an agreement to adjourn meeting two weeks failed. I also enclose a copy of my affidavit to the court asking for the injunction which was granted by his lordship Justice Latchford. As the object of my action had been accomplished and the company has announced that it would not go on with the proposed deal, I consented some time ago to have the injunction quashed, there being no further need for same.

You may use this letter and enclosed documents, or any part of my lines in any way you care to do so. I hope that such discussion will make independent actions of stockholders more popular and increase the chances of success in operating properties.

Yours, etc.,

A Large Shareholder of Temiskaming

Mining Company.

New York, July 10th, 1917.

#### S. F. KIRKPATRICK WINS McCHARLES PRIZE.

Kingston, July 4.—Professor Stafford K. Kirkpatrick, head of the Metallurgy Department of Queen's University, has been notified by the Board of Governors of the University of Toronto that he has been awarded the McCharles Prize of a gold medal and \$800 in cash for the invention or discovery of a new and improved process for precipitation of silver from its solution in the ores of Cobalt, and also a new and improved process for separation of cobalt and nickel in solution made from Cobalt ores.

#### NEWS FROM THE PAS.

The Pas, June 29, R. H. MacNeill is making arrangements for the active development of his properties at Herb Lake.

M. J. Hackett arrived in town from Herb lake and reports everything going along nicely there.

Professor Brooks is making an exhaustive examination of the Herb lake region in the interest of eastern capital.

I. MacMartin is busy examining the various properties with a view to the purchase of one or more of the likely ones.

Dr. Kitto, of Ottawa, in the service of the Federal Government, is on an inspection tour of the mining districts adjacent to The Pas. He is accompanied by Commissioner J. A. Campbell.

It is reported that the Graham Bros. have optioned their Beaver lake property at a large figure. J. M. Wanless was a prominent figure in the negotiations that resulted in the deal being put through.

Frank Biekle arrived at the camps at Herb lake on Thursday last after a somewhat arduous trip across the portage. He will make a personal inspection of several claims he is interested in, and report to his associates regarding development plans.—The Pas Herald.

### THE ENRICHMENT OF ORE DEPOSITS.

One of the most important of recent geological publications is entitled "The Enrichment of Ore Deposits, Bulletin 625 of the United States Geological Survey." The author, Professor William Harvey Emmons, head of the Geological Department of the University of Minnesota, is to be congratulated on the interesting form in which he presents the information contained in the publication, much of which is derived from researches carried out by himself and his students, and on the fair and judicial treatment he accords to the conclusions of other authors.

There is a tendency for many authors to push too far popular theories, and this has been the case of "enrichment" during late years. Judging from the writings of certain authors, for instance, it is difficult for them to believe that all enrichment or later deposition of ores does not come from the weathering and erosion of ore-bodies themselves. The theory of downward enrichment is so fascinating to them that they are prone to discard the possibility, or certainty in some cases, of there having been two or more periods of primary mineral-bearing solutions, each of which had its influence on particular orebodies. These "transmigrationists" are inclined to look on all ores of later periods of deposition as having been in a "previous state of existence," as ores in the eroded parts of the deposits in which they are now found. They do not go quite so far as the poet in the lines, "The dust we tread upon was once alive," but almost. Prof. Emmons is not an extremist, or an advocate who "sees only the client's side." He maintains a judicial attitude.

Professor Emmons makes the following distinctions between primary and secondary deposits:

"In this paper I apply the term 'primary' to all bodies of ores whose chemical and mineral composition has remained essentially unchanged by superficial agencies since the ores were deposited. These include ores that have replaced the wall rock and are 'secondary' after rock-making minerals or sedimentary beds. A secondary ore, as the term is here used, is one that has been altered by superficial agencies. The term is not restricted to pseudomorphous replacements but is used to include also material deposited by superficial processes in fractures in and near the primary orebodies.

"Frequently during the primary deposition of lode ores the veins already formed by ascending waters are fractured, and ascending waters again deposit material in the fractures. Such material, although it is later than the ore first deposited, is not to be regarded as 'secondary,' for only rarely is it formed by the solution and redeposition of an earlier ore, and its genesis is essentially similar to that of ore of the period of the earliest deposition. A few investigators, however, use the term 'secondary' to describe such a deposit and some to describe an orebody formed by ascending solutions that replaced the wall rock. It is unfortunate that the term 'secondary' is used with different meanings; but since nearly all writers employ it only to describe the results of downward-moving meteoric waters, reacting in or near an older mineral deposit, I have so restricted its use in this paper. Where the meaning is doubtful I have attempted to avoid ambiguity by using qualifying phrases."

The publication presents in the most serviceable form for all students of ore deposits data on weathering and the chemistry of enrichment. Not the least interesting feature of the book are the brief but well balanced descriptions of ore deposits of various parts of the world. These descriptions will be of service to those who are interested in the science of ore deposits as a whole and not merely in enrichment.

W. G. M.

### FIELD WORK OF THE GEOLOGICAL SURVEY DURING 1917.

The Geological Survey will carry on field work in the various provinces and territories of the country during 1917. The investigations and explorations will be directed mainly to the examination of areas that promise to be of economic value and will embrace particularly a continuation of the exploration of areas that are known to contain, or that may be expected to yield, minerals that are required in the manufacture of munitions and other objects connected with the prosecution of the war.

An investigation will be made into the character of the molybdenite deposits of Quebec and Ontario; and the deposits of tungsten-bearing minerals in Nova Scotia, New Brunswick and Yukon Territory, will receive further attention. The chromite and asbestos areas of Quebec will be studied in greater detail. Certain iron deposits of the Maritime Provinces and British Columbia will be examined. The copper-nickel deposits of the Sudbury district will receive attention and a study will be made of certain gold, copper, and silver-lead and zinc deposits of Nova Scotia, Quebec, Manitoba and British Columbia. Investigations will also be made into the petroleum and natural gas possibilities of Ontario and the prairie provinces, the coal fields of Nova Scotia, Saskatchewan and Alberta, the water supply of southern Saskatchewan and Alberta, the supply of road materials in portions of Quebec, Ontario and Saskatchewan, and the soils of portions of Manitoba.

The work that had been planned for D. D. Cairnes in Yukon Territory will, owing to his untimely death, fall upon the shoulders of William Cockfield, the assistant. Mr. Cockfield will continue an examination of certain auriferous gravels, and devote special attention to areas in which tungsten-bearing minerals are known to occur.

In British Columbia Charles Camsell will make a geological exploration of a belt of country traversed by the Pacific Great Eastern railway between Lillooet and Howe Sound. C. W. Drysdale will make an examination of the geology and ore deposits of the Windermere district, and M. F. Bancroft will examine the Lardeau area. Mr. Drysdale will also make a reconnaissance of portions of the valley of the north Thompson river. J. J. O'Neill will carry on geological work in the Hazelton district. Topographical mapping in this district will be carried on also by F. S. Falconer. The correlation of the Pre-Cambrian and lower Palaeozoic rocks of southern British Columbia will be studied by L. D. Burling, and a search will be made for phosphatic sediments. Bruce Rose will complete the geological mapping of the area in southeastern British Columbia and southwestern Alberta lying between 49 and 50 degrees north latitude and 114 and 115 degrees west longitude.

D. B. Dowling will continue his investigation of the coal resources of Alberta and Saskatchewan and of the occurrence of artesian water in certain dry belts. He will have general supervision of geological work in the

oil, gas and coal fields of western Canada. S. E. Slipper will collect records and all available information regarding borings that are being made in the prairie provinces. A. C. T. Sheppard will make a topographic map of a portion of country underlain by the Belly River formation in western Saskatchewan and eastern Alberta southeast of Edmonton. An examination of this area will be made by J. A. Allan with a view to ascertaining in what portions the geological structure is most favorable to the accumulation of petroleum or natural gas. The Cretaceous formations of the Peace River district will be examined by F. H. McLearn and the Devonian sediments about Great Slave lake by A. E. Cameron. E. M. Kindle will make a stratigraphical and palaeontological investigation of the Devonian rocks on Peace river, Slave river, Great Slave lake and part of Mackenzie river, for the purpose of establishing the age of certain fossil-bearing beds that may constitute horizon-markers in working out the structure of the rocks.

In Saskatchewan A. MacLean will continue the investigation of the coal measures. J. Stansfield will examine into the possibility of obtaining a continuous water supply at a reasonable depth in the section of country to the south of Regina. A survey of the available road material of a certain section of southern Saskatchewan will be made by L. Reinecke.

E. L. Bruce will continue the geological mapping of a portion of Saskatchewan and Manitoba north of Pas and will make a detailed study of the large deposits of copper and zinc. The geological mapping of the gold-bearing region about Wekusko and Reed lakes in northern Manitoba will be made by F. J. Alcock, and of the gold-bearing rocks in the vicinity of Manigotagan lake east of lake Winnipeg by J. R. Marshall. W. A. Johnston will make an investigation of the surface geology and soils of a region in the vicinity of lake Winnipegosis for the purpose of delimiting areas suitable for cultivation. He will also make a reconnaissance soil survey of a belt extending along the Hudson Bay railway.

The copper-nickel deposits of Ontario will be investigated in detail by W. H. Collins, who will also continue his work on the correlation of the Pre-Cambrian formations about Lake Huron. A portion of Renfrew county including some molybdenite deposits will be examined by M. E. Wilson. H. C. Cooke will make a geological map of an area in the vicinity of Fort Matachewan and T. L. Tanton will make a similar map of a belt about 20 miles wide lying along the Canadian Northern railway east of Nipigon. In both parts of the province attention will be paid particularly to the delimitation of belts that give promise of yielding minerals of economic value. A study of the surface geology and soils along the Canadian Northern railway east of Nipigon will be made by I. E. Stewart. R. C. McDonald will make a geographical map of a portion of the districts of Algoma and Thunder Bay. M. Y. Williams will carry on investigations into the stratigraphy and structure of the sedimentary rocks of southwest Ontario with a view to ascertaining the possibility of increasing the oil and gas producing areas. W. H. Boyd and K. G. Chipman will map a portion of Renfrew county and L. Reinecke will make a survey of road materials in the eastern part of Ontario.

An investigation will be made by M. E. Wilson into the character of the molybdenite deposit at Quyon, Quebec, and the neighbouring area will be geologically mapped. Robt. Harvie will complete his work on the

asbestos areas of Quebec and will make an investigation of the chromite-bearing rocks of the Eastern Townships. E. Poitevin will examine into the question of the genesis of the chromite of the Black Lake district. A survey of road materials in the vicinity of Montreal will be made by L. Reinecke and work on certain asbestos and copper areas will be carried on by J. K. Knox.

Geological mapping in central New Brunswick will be carried on by G. A. Young, who will pay special attention to the contact of the granite intrusives with the intruded rocks. An investigation will also be made into the character of the tungsten deposit on the southwest branch of Miramichi river. An examination of iron-bearing areas of New Brunswick will be made by A. O. Hayes.

E. R. Faribault will continue mapping the gold-bearing series of Nova Scotia and will carry on further investigation of the deposits of tungsten-bearing minerals at Moose river and Scheelite. D. A. Nichols will map the geographical features of a portion of Cape Breton Island in the vicinity of Mira bay. A. O. Hayes will map the geology of this area and will also investigate iron and other ore deposits in Nova Scotia.

#### WORKING ON ELECTRIC FURNACE PROBLEMS.

Through a co-operative agreement with Cornell University representatives of the U. S. Bureau of Mines of the Department of the Interior have been stationed at Morse Hall, where the electric furnace equipment of the Department of Chemistry of the University has been utilized in some of the metallurgical work of the Bureau.

The main investigation, which has occupied several years and is now nearly finished, has been a study of the electric melting of brass. The furnaces now used in the brass industry cause a large loss of metal by volatilization, and require crucibles, which have become very costly since the outbreak of the war. Long series of experiments have indicated that the use of a suitable electric furnace might materially reduce the metal losses and avoid the use of crucibles. The U. S. Bureau of Mines is now testing an electric furnace built on the design worked out in the laboratory tests. This furnace is of commercial size, is installed in a brass foundry, and is being tested with special attention to its suitability for use on such brasses as are used for cartridges and shrapnel cases.

Another electric furnace problem studied by the Bureau has been the production of ferro-uranium from the uranium oxide obtained as a by-product in the extraction of radium from its ores. Ferro-uranium is used in making uranium steel, which is said to be used by Germany for the liners of big guns which will stand up at a rate of fire so rapid that other steels fail.

As soon as the test on the large brass furnace is completed, work will be begun on the production of sample lots of uranium steel and other special steels, for test by the Bureau of Ordnance of the U. S. War Department as to their suitability for use in guns. The work on gun steel will also require the use of electric furnaces. It has not yet been decided whether this work will be done at Cornell or at one of the other Universities which have offered facilities for this work.

Various other problems incident to the main investigations mentioned above have been undertaken. The results of the work are published as fast as the problems are completed, in the bulletins and technical papers of the U. S. Bureau of Mines.

### SMELTER SMOKE DAMAGES.

Mr. Justice Middleton in his recent judgment on the smelter smoke cases said in part:

"Smelter smoke may, no doubt, be a nuisance, and in addition to being disagreeable it may cause injury to vegetation and in some circumstances I have no doubt an injunction ought to be granted. For reasons which will appear later I am of opinion that the mines cannot be operated without the production of smoke from the roast yards and smelters which contains very large quantities of sulphur dioxide.

"In each case it ultimately becomes a question of degree and in a much modified sense a question of the greatest good to the greatest number. I do not mean by this as I shall show that for the mere purpose of producing metal of value the owner of a mine may sacrifice his neighbors, but I think there are circumstances in which it is impossible for the individual to so assert his individual rights as to inflict a substantial injury upon the whole community.

"The individual right must be tenderly considered, but if pressed too far, if the courts are found impotent, the Legislature must intervene and the right of eminent domain must be asserted for the weal of the community as a whole.

"Until minerals were found, this whole country remained a wilderness but when mines were opened up towns and villages sprang up round the mines and farms began to be cultivated to supply the needs of the community.

"If the mines should be prevented from operating the community could not exist at all—once close the mines the mining community would be at an end and farming would not long continue. Any capable farmer would find farms easier to operate and nearer general markets if the local market ceased.

"It is the consideration of this situation that induced the plaintiffs' counsel to abandon the claim originally made for an injunction.

"All this appealed to me, but there is also a further consideration that seemed to me even more important. Nickel is essential for many of the world's greatest industries; the metal is only found in a few places; it cannot be mined and placed upon the market without producing a nuisance affecting at most a comparatively small area. Those going into that area to farm have (in almost all cases) gone there with their eyes open, seeking to avail themselves of a market in which abnormally high prices rule because of the demands created by those mines and their great distance from ordinary sources of supply.

"Some cases of hardship may exist, but according to the statement of counsel the mining companies have always stood ready to purchase the holdings of any individual at a price far in excess of the value.

"In my view the court ought not to destroy the mining industry even if a few farms are damaged or destroyed but in all such cases compensation liberally estimated ought to be awarded.

"Although the mines have been in operation for many years this is the first time in which actions have come to trial. The explanation given is that some arrangement for compensation has heretofore been made, but now claims have been made and adjustment seems impossible and the courts have been resorted to and much evidence has been given with the view of having it ascertained

how far the mines are answerable for the crop failures. The company sets up that many of the things complained of are not the result of the smoke but are to be attributed entirely to other causes, and that the claims are grossly exaggerated.

"Much time and money has been expended in preparing for the defence of these actions and I have had throughout to be on my guard lest the plaintiffs should be found waging an unequal warfare, but the plaintiffs represent a large constituency and their case has been well looked after. The admission by the defendants of certain evidence has saved the expense incident to expert evidence and has brought before the court the result of proceedings in other jurisdictions where similar situations have been faced.

"The suggestion has been made that there should be some attempt to utilize this sulphur dioxide. The only use to which it can be put is the manufacture of sulphuric acid. According to Professor Guess the output at the Canadian Copper Co. roast heaps would produce 2,500 tons of acid a day. The amount used in Canada is only 150 tons a day and the world's consumption, which has greatly increased since the war, is now estimated at 10,000 tons a day.

"Sulphuric acid cannot easily be stored or transported, it can only be handled in glass carboys; so the production at this enormous rate would create a much greater nuisance and source of danger than the sulphur dioxide.

"Quite apart from this aspect of the matter the commercial manufacture of sulphuric acid from the gas discharged from the roast beds is impossible and for the Sudbury ore, according to the evidence of Professor Guess, which I accept in its entirety, it is not practicable to abandon the open air roast.

#### Exaggeration of Claims.

"There was as I have indicated a not unnatural inclination upon the part of the farmers near the mines and roast beds to attribute all their misfortunes to them. There was also an inclination to exaggerate the possibilities of farming in the north country; but I regret to say this was clearly an endeavor in many instances to so exaggerate the claims put forward that not even the greatest charity and one might almost say the greatest credulity can acquit the claimants of positive dishonesty. This dishonesty was not confined to the parties merely but extended to many of the witnesses. I do not mean to include in this all the parties nor all the witnesses, but the presence of so much gross exaggeration has made the task of assessing damages particularly difficult.

"One case will serve as an illustration, that of Ostroski and his wife. These people have only been in the country a short time and have no real knowledge of farming under the conditions to be faced near Sudbury. They run a boarding house for men working in the mines.

"The land purchased was 360 acres, the price being \$650; \$150 being represented by a mortgage; \$500, the entire balance, being secured by a second mortgage—no money being paid. All this land was rock save at one place, a small valley with steep rocky banks through which a stream made its way. Part of this valley was beaver meadow. None of it well drained as the stream was blocked by a natural dam of rock. This valley was said to contain 25 acres. Survey shows it

to be less than half—just 12 acres. The plan shows this drawn out in a narrow and most irregular manner along the banks of the creek.

“This was cultivated, in a way, for the two years, 1915 and 1916. The man was most poorly equipped in every way. The claim for loss for the injury done by smoke to this 12 acres in 1915 was over \$2,500 and for 1916 \$2,727.59. I do not mean by this the lump claim which is sometimes made in pleading, but the claim as sworn to.

“Take another example. Black makes claim as a market gardener. His places were small, ill-adapted for the purpose and poorly cultivated with quite inadequate assistance. All the circumstances—climatic, seasonal, etc., were against him. Yet he estimates his production at a sum on the average 4½ times as great as Dilworth, an experienced and reliable gardener, says can be produced on the best ground under the most favorable conditions.

“On paper it is easy enough to show that beets and turnips should yield \$1,800 per acre, but they never do.

“Mr. Copping figures out in a conservative way in the spring that his cash income from his place would be \$3,000. It came to \$275.00.

“Experienced farmers say that they expect from \$10 to \$20 per acre from their farms and do well to get \$100 per acre from market gardens year in and year out.

“All these things must be kept in mind.

“Some of the farmers who came before me appeared to do little if any more than make a fair living for themselves and their families and such of them as were questioned upon this so said. I am now speaking of those who appeared to be successful and who were not complaining of damaged crops.

“No man with a few acres of this rough land ever made the incomes these claimants ask for damages.

“All these and other considerations have had to be kept in mind in assessing damages.

“After much consideration I have come to the conclusion to make my awards as best I can without giving any details of computation, thinking this on the whole fairest and best.

“From the beginning the plaintiffs have assumed in many instances that it is enough to say ‘I planted so many potatoes. The yield should have been so much—the smoke came, did some damage. All I harvested was so much.’ And then ask me to assume that the difference represents loss caused by sulphur. The evidence that the sulphur smoke caused the loss is lamentably weak.

“The principles are I think indicated by what I have said and no good purpose would be served by any attempt to revise evidence as applied to any particular crop or to the particular cases.

“In all circumstances I make the following awards which, while no doubt disappointing to the plaintiffs, are intended to be as generous as the evidence warrants.

To Black, \$1,000; to Taillifer, \$800; to the Sudbury Dairy Co., \$1,000; to Belanger, \$750; to Clary, \$1,400; to Ostroski, \$500.

“In view of the fact that these are test cases I have concluded to award costs in each case, but as there was so much exaggeration in the claims presented I shall fix the amount when bills are presented, reducing them somewhat from what would be allowed upon a taxation under a general award of costs.”

**DIVIDENDS FROM NORTHERN ONTARIO GOLD AND SILVER MINES.**

(From “The Northern Miner.”)

Dividends paid by companies in the District of Temiskaming in 1917, to June 30th:

Cobalt .....	\$2,923,624
Porcupine .....	1,519,029
Kirkland Lake .....	65,187
	<hr/>
	\$4,507,841

Dividends paid to June 30th, 1917:

Cobalt .....	\$70,242,487
Porcupine .....	10,687,029
Kirkland Lake .....	391,125
	<hr/>
	\$81,320,642

**Dividends Paid by Cobalt Silver Mines to June 30, 1917:**

Mining Company.	Amount of Dividends and Bonuses Paid During 1917 to June 30.	Total Amount of Dividends Paid to June 30, 1917.
Aladdin Cobalt .....	50,000	50,000
Beaver .....	.....	650,000
Buffalo .....	.....	2,787,000
Caribou Cobalt (Drummond) .....	.....	225,000
Casey Cobalt .....	.....	203,249
City of Cobalt .....	.....	139,321
Cobalt Central .....	.....	192,845
Cobalt Lake .....	.....	465,000
Cobalt Silver Queen .....	.....	315,000
Cobalt Townsite .....	.....	966,726
Coniagas .....	200,000	8,640,000
Crown Reserve .....	88,440	6,190,840
Foster .....	.....	45,774
Hudson Bay (T.&H.B.) .....	.....	1,940,250
Kerr Lake (Holding Co.) .....	300,000	6,870,000
LaRose (Holding Co.) .....	149,862	7,041,571
Mining Corporation .....	900,000	2,248,750
McKinley Darragh Sav. Nipissing Mines Co. (Holding Co.) .....	134,861	5,011,335
	90,000	16,240,000
Peterson Lake .....	42,031	462,350
Right of Way Mines .....	8,427	244,392
Right of Way Mining Co. .....	.....	324,643
Seneca Superior .....	.....	1,579,817
Trethewey .....	.....	1,111,998
Timiskaming .....	150,000	1,834,156
Wettlaufer .....	.....	637,465
Private Corporations .....	.....	3,825,000
	<hr/>	<hr/>
	\$2,923,624	\$70,242,487

**Dividends Paid by Porcupine Gold Mines to June 30, 1917.**

Dome Mines .....	\$300,000	1,500,000
Hollinger Consolidated .....	738,000	8,034,000
McIntyre-Porcupine .....	361,029	361,029
Porcupine Crown Mines .....	120,000	780,000
Rea Mines .....	.....	12,000
	<hr/>	<hr/>
	\$1,519,029	\$10,687,029

**Dividends Paid by Kirkland Lake Gold Mines to June 30, 1917.**

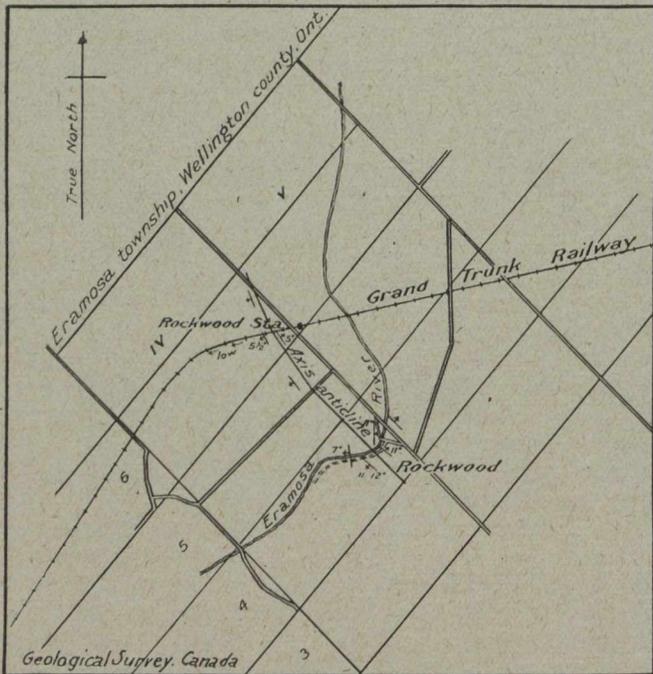
Tough Oakes Gold Mines .....	\$65,187	\$391,125
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### THE ROCKWOOD ANTICLINE.

In connection with the occurrence of oil and gas in Ontario mention was made in the 1863 Report of the Geological Survey of the presence of an anticlinal structure in the rocks in the neighborhood of Rockwood. In a Memoir published in 1915, "Oil and Gas in Ontario and Quebec," by W. Malcolm, the attention of the public was again directed to the Anticline. Recently, a disposition to test the anticline has been shown and the Geological Survey has had a further examination made by Dr. M. Y. Williams and has received from him the following preliminary report.

The rock outcropping at Rockwood village is the Lockport formation, commonly known as the Niagara limestone (dolomite). The Eramosa beds, which are at the top of the formation, occur along the small branch of the Eramosa river west from the railway station and south of the tracks. The base of the overlying Guelph formation is represented by a small outcrop overlying the Eramosa beds at the edge of the small tributary valley about 400 yards west of the station.

The surface rock, except in the quarries, is much broken up by frost action and weathering; but the deeper beds are thick and firm. To the west of the main street of the village, quarries have been worked



Sketch map of Rockwood and vicinity, to show anticline at top of Niagara.

Approximate scale of miles.

M. Y. Williams, 1917.

for lime for some years and at these quarries and also in the stream valleys and in the railway cut west of the station good rock exposures occur.

The main rock structure is very clear. A well defined anticline extends through the western part of the village. The crest of the anticline crosses the river about 200 yards southwest of the bridge on the road between Concessions IV. and V., west of the quarries, and extends through the Agricultural grounds, the west side of the school yard, through the middle of the rock cut on the railway about 235 yards west of the station, and crosses the concession road near the north side of lot 6. Immediately to the north and south of Rockwood a thick mantle of surface material covers the rock.

On the crest of the Rockwood Anticline, for a width of about 100 yards, the dips are 5 deg. or less to the east

and west. Further away from the crest the dips are about 10-11 deg., on the east and somewhat lower on the west. To the east the dip of the strata may be clearly seen 300 yards from the crest of the anticline in the exposures east of the bridge in Rockwood, and to the west the dip is clearly shown although undulatory, as far as the Guelph outcrop mentioned above. Allowing for the thickness of the Eramosa beds (about 40 to 50 feet) between the outcrop west of the station and the remnant of the Guelph rocks and for the difference in level of the outcrops, I have estimated that the westerly descent of the formation is about 70 ft. in 1,200 ft. or about 300 ft. in a mile. As the average dip of the formation to the west is about 20-30 feet per mile it is clear that the anticline is well marked.

This fold in the Niagara rocks was mentioned by Logan (G.S.C. 1863 report, p. 330) and more recently by Malcolm. Its importance to the prospector for oil or gas does not, however, appear to have been appreciated. Recent successful practice in both the oil and gas industries has been to bore on anticlinal structures, and it has been found in the Ohio field that surface structures extend downward for long distances. The recent work done by me in the Milton area shows that the structure at the top of the Trenton continues upward to the base of the red Queenston shale or a distance of about 1,500 feet. Whether or not the structure still continues upward into the Silurian (Niagara, etc.), is yet to be proved.

#### Possible Gas and Oil Horizons.

Two possible gas and oil horizons lie below the Rockwood anticline. These are the lower sandstones and sandy shales and dolomites of the Medina (upper or white Medina, or Cataract) with the whirlpool sandstone at the base, which produce most of the gas of the Niagara peninsula and some oil near Brantford, and the Trenton limestone which produces some gas and is known to contain a little oil at Milton. The new 3,000,000 ft. Dover well of the Union Gas Company, in Kent county, is in the Trenton. Although the Trenton has been a great producer of oil and gas in Ohio, so far it has not been very successfully exploited in Ontario. Comparatively few wells, however, have so far been sunk into it, and drilling has been done for the most part without regard to structure.

At Crewson's Corners, about 3 miles east of Rockwood, the sandy portion of the Medina was struck 25 feet below the base of the Niagara and was found to be 85 feet thick. At that locality the Niagara is 145 feet thick. At Rockwood it is probably somewhat thicker, possibly 200 feet thick. No gas is reported from the well at Crewson's Corners. On lot 6, con. V., Pilkington Tp., about 16 miles northwesterly from Rockwood the top of the Trenton is 1,115 feet below the base of the Niagara.

From the above information a fairly close estimate can be made of the depth at which the gas and oil horizons will be penetrated by the drill.

The anticline at Rockwood is the best defined of any known to the writer in southwestern Ontario, and affords a favorable location for prospecting for oil or gas.

Two other well marked anticlines separated by a syncline occur near the middle of the northeastern end of lot 12, con. 111, Nassagaweya Tp., Halton county. The direction of these folds is about North 25 deg. west and the dips on the sides of the anticlines are from 12 to 14 deg. toward the syncline. The crests are about 220 yards apart. The sides of the anticlines away from the syncline are covered by drift.

**I. W. W. ACTIVITIES.**

Seranton, Pa., July 4.—With the arrest today of Joseph Graber, an organizer of the Industrial Workers of the World, charged with being a spy in the employ of the German Government, Federal authorities declared their investigation had satisfied them that recent strikes and agitations of the I. W. W. in the anthracite coal regions had been stirred up by German agents with the hope of lessening the power of the United States in the war by decreasing coal production. Graber, who was taken into custody by United States Marshal James S. Magee, was held without bail under the Alien Enemy Act.

The above despatch indicates that suspicion of the German source of I. W. W. activities is not ill-founded. The Boston News Bureau under date of June 29 says in part:

“These stirring times, when economic conditions are in a state of flux and when the statistical position of labor has been growing so strong not only numerically but in the urgency of demand for its service, apparently have appealed to the I. W. W. as inviting its typical activities. That organization, with its past disturbing record in times of peace, becomes a far greater social detriment in wartime, through its general workings even more than in its backfire against registration and the draft. And the appeal may be considered similar for those whom Senator Thomas terms “individuals in employ of our enemies,” who no doubt find such tactics safer than bomb-plotting, and quite as effective.

“Anaconda has been tied up quite completely and the loss of over 1,000,000 pounds of copper daily from output will be seriously felt. There is basis for Butte belief that German money and German propaganda are back of the strike movement now rushing through the copper camps of the country.

“The districts most seriously affected include: Kennecott in Alaska, Anaconda and the remaining Butte camp, Anaconda's Tooele smelter in Utah, the Morenci district in Arizona. Agitators continue at work at other mines and smelters, one of their chief objects being to close down the Garfield smelter which handles the Utah Copper Co. concentrates as well as other custom material.”

**THE UNITED STATES ENGINEERING COUNCIL.**

On June 27th was held the first meeting of the Engineering Council. This body is a department of the United Engineering Society and has recently come into being as a medium of co-operation between the four American national engineering societies. The function of the Council may perhaps best be described by the following extract from the by-laws of the United Engineering Society: “The Council may speak authoritatively for all member societies on all public questions of a common interest or concern to engineers.”

The Council is composed of twenty-four members, five being appointed by each of the four founder societies and four by the United Engineering Society.

At the organization meeting held in the rooms of the American Society of Mechanical Engineers on June 27th the following officers were elected: President, I. N. Hollis; vice-presidents, H. W. Buck and George F. Swain; Secretary, Calvert Townley; Executive Committee, the four officers named with J. Parke Channing and D. S. Jacobus.

The Council discussed at length ways and means by which the founder societies through the Council may be of use to the nation. The unanimous desire to help the Government in the prosecution of this war resulted in a resolution instructing the Executive Committee to co-operate with the Government in procuring the services of engineers, also the appointment of a committee of three, consisting of Messrs. H. W. Buck, A. M. Greene, Jr., and Edmund B. Kirby, to consider the best means of utilizing the inventive ability of members of the founder societies.

The secretary was instructed to inform all Government Bureaus that might be interested in the organization of the Engineering Council and its desire to be of assistance.

**REOPENING OF COAL MINES.**

A Canadian Press Despatch dated at Calgary, June 27, is as follows: The mines in District 18 and in the Red Deer Valley will reopen at once. An order to the operators to this effect was issued today by Commissioner W. H. Armstrong, who was appointed by the Dominion Government to investigate the situation and to take such action as might be deemed necessary in the public interest.

Mr. Armstrong has wide powers under the order in Council under which he is acting, and the operators have no recourse but to obey the mandate.

The mines probably will be in operation by Tuesday next, July 3.

The word has to be disseminated among the men, who are widely scattered as a consequence of the prolonged strike, and it will be impossible to get them together before that date.

The terms under which the mines will operate will be those enunciated by R. F. Green after his recent inquiry here. Mr. Green reported in favor of the operators eliminating the penalty clause, of them paying an increase of 7½ per cent. more than the tentative agreement, and of appointing a Commission to investigate the living cost and conditions every four months, at the request of either party.

These terms provide for an increase over the old agreement of about 22½ per cent., as the scale in the tentative agreement was about 15 per cent. above that of the old agreement. The penalty clause was to penalize the men if they violated the agreement. The Commission is supposed to adjust the wages on the basis of living cost, and may accordingly raise or lower the rate of pay.

About eight thousand men have been affected by the strike, and the majority have been idle since the 1st of April, and some for a longer period. The loss in wages amounts to hundreds of thousands of dollars, and the end has not come a moment too soon, for the coal stocks were getting low, smelters were closing down, and the railways were threatened with a shortage for the hauling of the 1917 grain.

**STEEL-HARDENED CASTINGS.**

The Stroh Steel Hardening Process Co. of Pittsburgh has issued an interesting bulletin on its products. The Stroh process is a method for casting the finest alloy steel together with ordinary soft steel in one solid piece. The resultant casting has a wear-proof alloy steel stratum on the wearing surfaces. A number of Stroh products are used in the mining industry: mine car wheels, mill castings, crusher heads, crusher jaws, etc.

### CANADIAN COPPER AND INTERNATIONAL NICKEL REPORTS.

Some interesting information concerning the reports issued by the International Nickel Company was given before the Ontario Nickel Commission by A. D. Miles, president of the Canadian Copper Co. The following is from the evidence taken:

Q. There are one or two matters I do not understand here, and I am going to ask you to enlighten me. You are now operating your company, as far as the International is concerned, under this agreement of the 31st of March, 1909, of which you gave us a copy? Is this the latest? A. That is the latest. Prior to that time, there were minority shareholders in the Canadian Copper Company, and a complete set of books had to be carried and a report issued to these minority shareholders. Since that stock was acquired, it has not been necessary, except for the purposes of bookkeeping, so the contract has never been renewed, but has been in force ever since.

Q. Were there annual contracts before that, each of the same nature? A. I am not sure whether they were annual, they may have been for two or three years, but they were renewed at set times.

Q. Was there any variation from year to year in the price, 7c. for copper contents, and 10c. for nickel contents? A. Yes, it was varied once that I remember, and possibly oftener.

Chairman: I was under the impression that there had been no variation in that agreement? A. Oh, yes, from 1902 to 1909 there were changes.

Mr. Young: And there must have been a similar agreement before 1902, when the Canadian Copper Company and the Orford Company were at arm's length? A. When they were two separate companies, yes, but I don't know that they were available. That was before we had anything to do with the companies. The mine was owned by one group of men, and the refinery by another.

Q. Yes, but the Canadian Copper Company at that time had everything to do with it? A. Yes.

Q. So that if you could get that, it might be helpful as to the agreements between the Canadian Copper Company and the Orford Company prior to 1902? Have you any other inter-company agreements, the Canadian Copper Company with the International subsidiary companies, except this one? A. Yes, with the Huronian Company.

Q. Do you know whether there are inter-company agreements between other concerns? A. Not that I know of.

Q. You don't know about that? A. No.

Q. Now this balance sheet is interesting, could I trouble you to look it over for me. (The Canadian Copper Company balance sheet for the year ending 31st March, 1916, shown to Mr. Miles). You might tell us shortly how you make your balance sheet up here. You are operating with The International Nickel Company under the agreement of 1909? A. Yes.

Q. That agreement determines the price you get for your copper and nickel contents? A. Exactly.

Q. Then on that basis you deal with the International as if they were real purchasers? A. Yes.

Q. And this statement is the result, because you have no other purchasers; you don't sell to anyone else? A. No.

Q. And here are your assets,—property, \$9,174,000 odd. Now the assets of The International are \$44,000,000 odd. What makes up the difference generally? A. The New Caledonian mines, the refinery, the stock of

the Canadian Copper Company, the Huronian Company, the Upper Spanish Improvement Company, and all other subsidiary companies.

Q. Well, could these account for the difference? I am not asking in any spirit of hostility; I have a great zeal for facts? A. The value of these properties, plants and stocks account for the difference.

Q. It covers properties owned and operated. Now this statement of yours is presumably as correct as you could make it; that is, to the value of your assets in Ontario? A. Yes. There is no ore included, that is only the property.

Mr. Gibson: Does that not include the mines? A. It includes the mines as property, as real estate.

Q. Does it not take in the value of the mineral deposits? A. No, it does not.

Mr. Young: Then the current assets speak for themselves and are correct? A. Yes.

Q. Now the inventories in The International statement for the same year are \$4,000,000 and over, and your metals are only \$758,000. What does that inventory include? A. The inventory of The International Nickel Company includes supplies, metals in stock and metals in process. The inventory of the Canadian Copper Company includes supplies and metals in process only. Supplies \$772,000, metals \$758,000, total, \$1,530,000.

Q. The Canadian Copper Company would not include matte stock? A. No, it includes only metals in process; the matte is shipped as it accumulates.

Q. That would include all their supplies? A. Yes, the difference of \$2,470,000 is accounted for by supplies, finished products, matte in stock and metals in process.

Q. Then on your liability side you have noted The Huronian Company, that is not the capital stock is it? A. No, that is the amount the Canadian Copper Company owes the Huronian Company for power.

Q. That would be your charges for power? A. Yes, we operate the Huronian Company.

Q. Then, what is the liability to The International Nickel Company, of \$3,937,000? A. That is the balance, or the difference between the total and \$5,800,000 which was a dividend.

Q. And then there is another set of entries here that I would be glad to have explained. Take the item of depreciation, you write off \$1,611,182 for your depreciation. What does that cover? It is not mineral exhaustion? A. No, it covers plant depreciation.

Q. Then in the same year The International write off \$806,000; that must be for their plant? A. Yes.

Q. Do you know on what basis they are making that up, what percentage? A. Yes, a life of fifteen years.

Q. You might explain very shortly your depreciation basis, because it might help us in other aspects of our enquiry? A. The plant and buildings are depreciated on their estimated life. The life of some machinery is little over one year. Some of the buildings and more permanent equipment have a life of considerably over fifteen years. The average life, however, of all machinery and buildings is estimated at fifteen years.

Q. The depreciation, the Chairman points out, represents about 15 per cent. of your property? A. Yes, more than 15 per cent.

Q. Then the item of mineral exhaustion, \$1,236,521, is that an actual statement or an allowance? A. That is an estimate based on the tons of ore treated. It is the amount per ton of ore treated set aside to amortize the original cost of the property. It is an arbitrary figure.

Q. Now, The International Nickel Company wrote down \$900,827 for exhaustion of mineral. I don't understand that; where have they got any minerals? A. They own all of the stock of the Canadian Copper Company, and of Societe Miniere Caledonienne, and part of the Nickel Corporation, Limited. The Canadian Copper Company have accumulated a fund for mineral exhaustion of \$1,236,521.90, which is a reserve to March 31st, 1916, while The International Nickel Company reserved during the year ending March 31st, 1916, for mineral exhaustion, \$900,827.58.

Q. You might explain this entry of The International Nickel Company in current liabilities and its entry of payment to that Company, of \$5,800,000. A. The funds of the Canadian Copper Company accumulated, and the \$5,800,000 was a dividend paid by The Canadian Copper Company to its shareholders.

#### THE PROPOSED IMPERIAL DEVELOPMENT BOARD.

London, Eng.—An interesting paper was read by Capt. Richard Jebb recently before the Royal Colonial Institute on the proposed Empire Development Board, than which, he said, nothing had excited more attention in the report of the Dominions Royal Commission. Capt. Jebb was also of opinion that the resolutions of the Imperial War Conference, recently published, and Mr. Lloyd George's speech at the Guildhall on 27th April encouraged the hope that effect may be given to the proposal as soon as possible after the war. The lecturer summarized the proposals of the Royal Commissioners as follows:—

(a) To continue, complete and thereafter keep up to date the survey begun by us (the Royal Commissioners) of the relation between the production and requirements of the Empire in the matter of food supplies, raw materials and all other commodities essential to its well-being; (b) to watch and report upon the changing requirements of the Empire in respect of such materials and commodities, and to mature plans for promoting and improving their production within the Empire; (c) to investigate in collaboration with existing institutions and committees for scientific research—(1) the possibilities of production within the Empire of such of these essential materials and commodities as now are, or may in the future be found to be, mainly produced and controlled outside its limits, as well as the possibilities of new supplies generally; (2) the best means of promoting efficiency and preventing waste in existing methods of production; (3) the possibilities of the utilization of substitutes for essential commodities which are not found to be available within the Empire; (d) to consider and devise means for the direction of Empire capital towards the development of Empire resources; (e) to study the larger aspects of migration within the Empire with a view to securing and maintaining a sufficiency of population in all its parts; (f) to advise on the adequacy for Imperial requirements of schemes of harbor improvement in certain of the great ports within the Empire; (g) to study lines of communication by steamship, cable or railway which are contributory and necessary to Imperial development; (h) to study and report upon legislation affecting the mechanism of trade in its widest sense, and to keep in touch with development in similar legislation throughout the world; (i) to prepare and publish Imperial statistics.

At the conclusion of his lecture Capt. Jebb said:—“I feel that all of us should unite in urging that the

establishment of an Empire Development Board on the lines proposed by the Royal Commission should be the very first business of the Imperial Conference which is to be convened after the war.”—Financial Times.

#### IMPERIAL MINERAL RESOURCES BUREAU.

London, Eng.—By direction of the War Cabinet, Dr. Addison, the Minister of Munitions, has made arrangements for the appointment of an Inter-Departmental Committee to prepare a scheme for the establishment in London of an Imperial Mineral Resources Bureau (a) to collect information in regard to the mineral resources and metal requirements of the Empire, and (b) to advise what action, if any, may appear desirable to enable such resources to be developed and made available to meet requirements. The committee consists of the following:—Sir James Stevenson, Bart. (Chairman), Mr. C. L. Budd, Sir A. Duckham, K.C.B., Prof. W. R. Dunstan, C.M.G., Mr. C. W. Fielding, Mr. J. F. N. Green, the Right Hon. Lord Islington, G.C.M.G., Mr. L. J. Kershaw, C.I.E., Sir Thomas Mackenzie, Sir George Perley, K.C.M.G., Mr W. S. Robinson and the Right Hon. W. P. Schreiner, K.C. The Secretary to the Committee is Mr. Oswald C. Allen, and all communications on the subject should be addressed to him at the Ministry of Munitions, Whitehall-place, S.W.1.

The appointment of the above Committee follows on the appended resolution passed by the Imperial War Conference:—

“That it is desirable to establish in London an Imperial Mineral Resources Bureau, upon which should be represented Great Britain, the Dominions, India, and other parts of the Empire. The Bureau should be charged with the duties of collection of information from the appropriate Departments of the Governments concerned and other sources regarding the mineral resources and the metal requirements of the Empire, and of advising from time to time what action, if any, may appear desirable to enable such resources to be developed and made available to meet the metal requirements of the Empire. That the Conference recommends that His Majesty's Government should, while having due regard to existing institutions, take immediate action for the purpose of establishing such a Bureau, and should as soon as possible submit a scheme for the consideration of the other Governments summoned to the Conference.”—Financial Times.

#### IN SOUTHERN YUKON.

The Weekly Star, published at Whitehorse, Yukon Territory, said on June 8: Messrs. Madougal and Gaunt, two of the four lessees of the Fleming group of claims at Conrad, Southern Yukon, were in Whitehorse early in June and while there purchased a supply of sacks which they took back with them to use in the shipment of about two earloads of ore they have taken out since commencing work several weeks ago. Both were much elated over the prospects of the Fleming mine, an extension of the Venus, from which latter mine a lot of high-grade gold-silver ore is now being taken out by Supt. MacFarland, some of which runs as high as \$1,000 per ton.

From Mr. Gaunt it was learned that the people working the Venus mine now have 1,800 tons of high-grade ore on the dump which they intend shipping to the smelter as soon as navigation shall open. The low-grade ore will be concentrated by the oil flotation plant which has just been put in at the Venus mine, and which is now being tried out in a working test.

### MR. HOOVER'S APPOINTMENT.

The Board of Directors of the American Institute of Mining Engineers at a recent meeting passed the following minute regarding the appointment of Herbert C. Hoover as Food Controller of the United States:

This Board has learned with pleasure that the President has nominated Herbert C. Hoover as Food Controller of the United States.

Mr. Hoover has been for 21 years a member (for 2 years a Vice-President), and is at the present time an Honorary Member, of this Institute, and his professional career is well known to American and foreign engineers. His field work on State and Federal geological surveys; his management of important mining and engineering enterprises in the United States and Australasia, and in China as Chief Engineer of the Imperial Bureau of Mines; his courageous and skilful leadership of a continuous battle of 39 days, and his subsequent organization and conduct of the defence of Tientsin, besieged by the Boxer forces; his directorship, on his own responsibility, or as a member of the firm of Bewick, Moreing & Co., of gigantic works of engineering and transportation in almost every part of the world; has marked him, before the beginning of the present war, as one of the most efficient, resourceful and successful administrative engineers of his generation.

These qualities were strikingly exhibited when, at the outbreak of the war, Mr. Hoover organized in London a volunteer committee of American mining engineers, which supplied the immediate needs and returned in safety to this country 100,000 frightened and helpless American refugees. It has been asserted that this great achievement was due to the support of the U. S. Government. But that Committee expended in its work \$300,000 of the money of its members and their friends, and commanded the support of the Government by its conspicuous success.

In like manner, that wonderful achievement, in an emergency which found all governmental agencies inadequate and unprepared, led to the selection of Mr. Hoover as Head of the Belgian Relief Commission, which had expended more than a hundred million dollars with unexampled economy, honesty and efficiency, retaining the confidence of both belligerent parties.

In view of the foregoing record, and of its own knowledge of Mr. Hoover's personal character and methods, this Board unhesitatingly declares its opinion that he is the man best qualified to meet the emergency which has suggested the action of the President, and earnestly recommends to the Congress of the United States the approval of that action by appropriate legislation, and to the Senate of the United States the ratification of Mr. Hoover's appointment as Food Controller.

### MOLYBDENITE AT WILBERFORCE, ONTARIO.

A company, known as the Dominion Molybdenite Limited, has been formed by Toronto men to operate a molybdenite deposit at Wilberforce, Ont. The organizers, J. J. Gray, W. J. L. MacKay and P. J. Dwyer together with Dr. Lowrey, control the stock. Mr. Dwyer sends us from the property the following information:

"The molybdenite discovery made at Wilberforce last winter has developed into a proven orebody of large dimensions. The owners have received such good reports from different mining engineers and experts, that they have decided to erect a mill."

### THE APPLICATION OF THE FLOTATION PROCESS.

The concentration of sulphide ores, particularly low-grade ores, carrying gold, silver, copper, lead, zinc, and other metals, seems to be undergoing a revolution. Except for ores that could be smelted directly, or for gold and silver ores that could be treated by stamp milling, with or without cyaniding or chloridizing, the generally accepted plan of concentrating sulphide ores has been concentration by gravity, involving the use of jigs, buddles, vanners, or tables. Within the past 15 years, however, metallurgists throughout the world have come to recognize the enormous possibilities of concentration methods based on entirely different principles—the surface tension of liquids and the adhesion of liquid films to the surfaces of minerals. These principles are used in what are known as flotation processes. Ingalls has aptly characterized flotation as concentration upside down, because usually the heavier ore mineral rises, while the lighter gangue mineral sinks.

For convenience, flotation may be defined as the process or processes by which the valuable minerals in a mass of finely ground ore are caused to float on a liquid into which the finely ground ore is fed. Flotation processes can be grouped as of two types—film flotation and froth flotation. In film flotation the floating mineral particles are sustained on the surface film of the liquid. In froth flotation the minerals floated gather in and on the surfaces of bubbles of air or gas driven into or generated within the liquid. As the surface of a mass of bubbles overlying a liquid is greater than that of the upper surface of the liquid itself, a froth will carry a greater burden per square foot of area of liquid than will the film surface of the liquid.

In the application of flotation there is opportunity for endless variety of detail. Thus, in froth flotation the bubbles may be produced by beating air into the pulp or ore-carrying liquid, by forcing air through it, by generating a gas through the action of acids in the liquid on some constituent of the ore, or by applying reduced pressure to the surface of a pulp saturated with air.

The great field of flotation has been the preventing of slime losses at ordinary concentrating mills for ores containing valuable sulphides or native metals. Also, flotation is particularly adapted for the treatment of an ore carrying valuable minerals in very small grains. As regards gold and silver ores ordinarily treated by cyanidation: Some can be profitably treated by flotation, and from some it is possible to recover gold and silver that can not be profitably recovered by the cyanide process. However, it is hardly probable that flotation will completely displace the cyanide process for gold and silver ore, or leaching processes for copper ore, because the latter produce metal for shipment, whereas flotation ordinarily yields only high-grade concentrates for shipment to smelters.

So rapidly is the art of flotation advancing that any complete treatise on the subject is likely to be out of date by the time it is printed. However, as the U. S. Bureau of Mines is continually receiving inquiries regarding a number of more or less practical questions that are seemingly not answered with sufficient clearness

in the existing literature, attempt is made in a bulletin just published to answer such questions as are more pertinent and important. Answers to some of the questions are to be found in the literature of flotation, but the majority, possibly because they are decidedly practical, seem to have been overlooked or left unanswered. The discussion in the bulletin, technical paper 149, by D. Ralston does not attempt to cover the theories put forth to account for the facts accumulated by the many experiments with flotation, nor does it attempt to describe in detail flotation plants nor the procedure in different mills. Rather it seeks to answer questions that are apt to be asked by persons who wish to know the possibility of successfully applying flotation to a given ore or mixture of ores.

#### INCREASED WAGES FOR MINERS.

Timmins, July 4.—The labor situation in the Porcupine is gradually clearing up, and all danger of further serious difficulty is now believed to be removed. The biggest mines in the camp have made wage increases that seem to meet the needs and generally satisfy the men. The McIntyre and Dome as noted last week gave a straight raise of 50c per day, and the Porcupine Crown and V.N.T. expected to make arrangements satisfactory to all concerned. Since then the Hollinger has talked the wage question over with some of its employees and on Saturday notices were posted informing employees that the minimum wage for underground would henceforth be \$4.00 per day. The Hollinger's chief need at present is for "muckers," and at \$4 per day it is not likely that there will be any difficulty in securing a full staff. Of course, some of the machine men do not like the new arrangement as it is intended to dispense with their helpers, leaving them to do their work without the assistants. However, as many of the machine men are now working under contracts, and so are not affected by the change, no difficulty is expected on this score. Also, it may be noted that in other camps machine helpers are not usually supplied, nor do the men under contract employ them.

The Hollinger underground minimum wage includes "muckers" at \$4.00 per day, though this is 50c per day more than asked for this class of labor by the Union schedule. The Hollinger, however, felt that if machine men could not live on less than \$4.00 per day, the high cost of living would press equally hard on the "muckers," so the general rate of \$4.00 was made.

In making the new rates, none of the mines considered the recognition of the Union, dealing only with their own employees. The Union on its part did not press "recognition" at this time. As in the case of some of the other mines, bonuses were also dropped under the new scale by the Hollinger.

The effect of the Hollinger announcement on Saturday was to give a renewed cheerfulness and active hopefulness to the camp. Several business men ventured the opinion that they could already see the good effect on business through the public confidence that all difficulties were near an ending, and that renewed and increased activity was coming to the camp.—Porcupine Advance.

#### CANADA COPPER CORPORATION.

In addition to its British Columbia Copper Co. operations in the Boundary district of British Columbia, the Canada Copper Corporation has for several years been developing another copper property, situated on Copper Mountain, within a dozen miles of Princeton, Similkameen district. The company in 1916 spent \$396,000 on the further development of this Copper Mountain property and on the purchase of several neighboring claims, under bond. The company's annual report, issued lately, gives some particulars of the work done last year to confirm results indicated by diamond-drilling previously done. This work was mainly in the nature of underground development, which may also be utilized for the permanent operation of this property. To expedite doing this underground work, a power transmission line 13.6 miles in length was constructed to Copper Mountain from East Princeton, where there is a power plant at inoperative cement works, a lease of which power plant had been secured by the Canada Copper Corporation.

On the Copper Mountain property, a tunnel, 9 by 9 ft. in the clear, was driven a distance of 2,100 ft. on the 3,950 ft. level, and numerous raises and lateral drifts were made, the total length of this work being 5,206 ft. As soon as it became apparent that the results secured from diamond drilling were reliable, drilling from the surface was resumed, and 8,007 ft. of diamond-drilling was done in 1916. In addition, trenches to a total length of 2,364 ft. were opened on newly located mineral claims. No material increase in ore reserves is reported for the period under review, because the underground work was done especially to check the accuracy of the previous diamond-drilling operations. Underground diamond-drilling is now being done from faces opened last year, and it is reported that new ore is being encountered.

Prior to the execution of the underground development campaign, it was deemed expedient to class the ore as "reasonably assured" and "probable" ore. It is now estimated that there is 10,000,000 tons of definitely assured ore and 2,000,000 tons of probable ore. The average grade of this ore is 1.74 per cent. copper (or nearly 35 lb. to the ton of ore) and 20c. a ton of recoverable gold and silver. The ore thus far developed is well above the level of Similkameen river. It is of primary nature and while likely to extend below the level of the river, operations for many years to come will be confined to areas above the river, and extraction of the ore will be by means of tunnels. Approximately one-half the ore thus far developed will be extracted by means of open-cut mining.

At the beginning of 1916 a 50-ton experimental flotation mill was placed in operation for the purpose of outlining definitely the metallurgic procedure to be adopted in a large mill. The opinion of the company's own engineers regarding the geologic features is said to have been confirmed by an independent report on the properties made by Mr. Sydney H. Ball. Mr. Allen Hastings Rogers, who also made an independent report on the property, confirms the company's estimates of quantities of ore and its value. His conclusion was that the property is sufficiently developed to warrant the erection of a mill to have a capacity of 3,000 tons a day. The cost of producing copper was estimated at 9.57c. per pound, based on existing smelting rates.

**OBITUARY.****Dr. Robert Bell.**

Dr. Robert Bell, a geologist and explorer who for many years was in the employ of the Canadian Geological Survey and was for some years Acting Director of the Survey, died recently at Rathwell, Manitoba.

Dr. Bell did much useful pioneer work in Canada, particularly in exploring the hinterland. He will be long remembered for his contributions to the geology and geography of Canada.

Dr. Bell was born in Toronto in 1841. He joined the Canadian geological survey as an assistant in 1856. From 1858 to 1861 he studied engineering and surveying in McGill university, receiving the degree of M.D. and C.M., having included medicine and surgery in his studies. He was medical officer, naturalist and geologist of the Neptune expedition in 1884, and of the Alert expedition in 1885 to Hudson strait and bay. He was geologist of the Diana expedition in 1897 when he surveyed the south coast of Baffin land. He was royal commissioner on the mineral resources of Ontario in 1888. Dr. Bell traversed so many unknown spots that he became known as the principal place-name father of Canada. He is said to have seen more game, fish, wild Indians and Eskimos than any other man. He collected much folklore. He won geographical distinction in regard to the Athabasca, Slave, Churchill, Nelson, Hayes, Winnipeg and Albany rivers. Dr. Bell was one of the founders of the Royal Society of Canada.

**M. C. M. CLEARING FOR ACTION.**

Houghton, July 5.—The Michigan College of Mines campus became an army training camp yesterday. The officers of the Michigan battalion of engineers were ordered to duty and the college, to all intents and purposes has become a training place for soldiers.

The engineers are ready for their camp and are awaiting their tentage from the state. The officers have laid out the campus for the purpose of the camp and the plans involve the removal of most of the trees on the grounds. The tents will be located west of the mechanical building, which is midway of the campus, and the drill ground will be east of that building. The college has set aside the old assay laboratory near the mechanical engineering building as the battalion mess hall.

**BULLETIN ON AIR COMPRESSORS.**

Bulletin K-302, illustrating a line of steam driven, straight line, single stage air compressors manufactured by the Canadian Ingersoll-Rand Co., Limited, of Montreal, has been received. The type of machine described is designed to cover the field of those requiring compact, self-contained units of small and medium size for service in shop, foundry, mill or electrical plant, etc. Automatic splash lubrication, dust-proof construction, "Circo" silent leaf valves and quick convertibility to belt drive are among the leading features of the design dwelt upon in this publication.

**DOMINION STEEL.**

"We are booked up in steel products to the end of the calendar year," President Workman told the shareholders of Dominion Steel Corporation at the annual meeting held at Montreal last month. "and in addition to that our shell steel output for the first six months of 1918 has been disposed of."

**PERSONAL AND GENERAL.**

Mr. Thomas Kiddie, for a number of years a well known metallurgist in the Coast district of British Columbia, but latterly residing in Southern California, is on a visit to Vancouver, B. C.

Mr. John Hopp has gone to Barkerville, Cariboo district, B. C., to his several hydraulic placer-gold mines in that region, after having spent the winter on the Coast. It is reported from Barkerville that partial clean-ups on several of the hydraulic properties have been very satisfactory thus far this season, which is not yet half over.

Mr. D. Kerr, manager for the Northern Manitoba Mining and Milling Co., which had previously shipped some ore from the Le Pas district for a bulk test, was at Trail, B. C., last month.

Mr. James Cronin, for years manager of the St. Eugene mine in East Kootenay district of British Columbia, when that mine was the biggest producer of lead in Canada, has returned to the Babine country, in Omineca mining division, to continue mining on the group of mineral claims he has been developing there for several years.

Dr. A. P. Coleman, Professor of Geology in the University of Toronto is in South America studying glacial phenomena.

Mr. C. W. Brown succeeds Mr. T. R. Stockett as manager of the Western Fuel Co.

Mr. E. L. Bruce will continue this summer the geological mapping of mineral areas north of the Pas, Manitoba.

Mr. H. C. Cooke, of the Geological Survey, is to make a map of the Fort Matachewan area this summer.

Mr. A. G. Burrows of the Ontario Bureau is examining gold deposits in Powell township.

Mr. Geo. R. Rogers has opened an office at 905 Traders Bank Bldg. Toronto.

Mr. Samuel Seaver and Mr. E. J. Albert of Toronto have been elected members of the Canadian Mining Institute.

Mr. N. B. Davis, economic geologist, Kingston, is entering the consulting field. He specializes in the non-metallic minerals.

**BARYTES AND LITHOPONE.**

Barytes (barite or barium sulphate) is used chiefly in making mixed paints, in which white, ground, and water-floated barite is employed as a pigment. Ground barite is also used in the rubber industry and to some extent by the makers of heavy glazed paper and ink. Lithopone, a chemically prepared white pigment consisting of about 70 per cent. barium sulphate and 30 per cent. zinc sulphide, is one of the chief constituents of the "flat" wall paints so extensively used in office buildings and hospitals, replacing the less desirable paper and calcimine wall finishes.

Since the beginning of the war a barium chemical industry has been established in the United States to supply barium carbonate, nitrate, chloride, chlorate, hydrate, and binoxide, which were formerly imported largely from Germany. In 1915 this industry consumed 10 per cent. of the output of domestic barite, but the consumption in 1916 was apparently somewhat larger. The barium chemicals have a wide variety of applications, perhaps the most important of which are the use of barium binoxide in the preparation of hydrogen peroxide, that of barium chloride as a water softener, and that of various salts in the manufacture of optical glass.

## SPECIAL CORRESPONDENCE

### NORTHERN ONTARIO.

#### Porcupine East Lake.

St. Louis financial interests are said to have taken an option on the Porcupine East Lake property. These claims are situated in the Township of Whitney, in the Porcupine district. When prospected a short time ago results obtained were considered very favorable. Diamond drilling will be commenced within a short time for the purpose of proving the properties at depth. A little free gold has been discovered in veins on the surface.

#### Dome.

The big main crosscut of the Dome Mines at the 700-foot level should encounter the large high-grade orebody indicated by the diamond drills any day now. This body of ore is estimated to be approximately 120 feet in width and to carry values of around \$17 to the ton. Heretofore the Dome ore has averaged less than \$6 to the ton and the importance of the huge body of \$17 ore can hardly be appreciated by the layman. However by the middle of August this ore should be available for mill feed, and its effect on the mill heads and profits of the company will no doubt immediately be felt. With the completion of the crosscut through the orebody, stoping, drifting and winzing operations will be commenced at once and by the end of the current year this body will probably be developed sufficiently to allow of its estimate being included in the ore reserves, which should show a substantial increase both in values and tonnage. It has always been more or less difficult to estimate ore reserves at the Dome, owing to the extremely varied distribution of the values and the occurrence of the ore in large masses entirely without walls. The milling capacity of the Dome has been increased during the past year to 1,500 tons per day, and the mine equipment has been completed and put in operation, with the result that considerable reduction in the cost of handling may now ensue. The underground equipment of the mine is sufficient to produce at a capacity of 3,000 tons per day, so that any future demands on this portion of the plant will be readily met. At the 1,150-ft. depth another large orebody averaging around \$10 to the ton has also been indicated, which is believed to be the downward continuation of the orebody at the 700-ft. level. Whether this proves to be the case or whether this is an entirely new orebody, it will prove of extreme importance to the future of the mine.

Recently the management of the mine increased the wages of their employees to meet the high cost of living, and there is said to be little likelihood of trouble arising from this source for some time to come. While handicapped to a certain extent by the scarcity of labor at the present time, it is said that this condition shows considerable improvement over a month ago, and gradually the number of men on the pay-roll of the company is increasing.

#### McIntyre.

The face of the big main drive at the McIntyre-Porcupine mines at the 1000-ft. level is now within a few feet of the Jupiter line and shows 52 feet of ore. At every level between the 400 and 1000-ft. development work is being prosecuted. This development work is being centralized in such a manner as to permit of the ore being dropped from the upper levels of the mine through passes to the 1000-ft. level where it will be deposited in cars and transported to the main shaft. About 350 men are employed underground at the prop-

erty and over 50 faces in ore are being worked at the present time. With the completion of additions to the crushing equipment of the mill the capacity will be brought up to 600 tons per day. At present 500 tons per day is being treated at a cost of between 80 and 90 cents a ton for milling, which is a record for any Ontario gold mine. In spite of the fact that no effort is being made to regulate the grade of ore going to the mill, most of which is coming from development, the heads are being maintained at about \$10 to the ton. It is estimated that the ore blocked out in the mine averages around \$12.50 to the ton, and when the work becomes more centralized it is anticipated the heads will come nearer to this figure.

Recently the McIntyre gave their men an increase of approximately 50 cents a day in their wages and complete harmony is said to exist between the management and the men. The scarcity of labor has not curtailed production to any great extent at the McIntyre.

#### Hollinger.

The last report of the Hollinger mining company shows a big falling off in the production of the mine owing to the shortage of labor. At the present time about 800 men are on the pay-roll as compared with a desired number of 1,500. The costs per ton were given as \$4.66. When it is considered that Hollinger has frequently milled and mined its ore for a cost of \$3.62 per ton, it will be plainly seen that the labor shortage is cutting no small figure with the company. The average grade of ore treated also shows a considerable falling off. All construction on the new 1,000-ton unit for the mill has been suspended, owing to the fact that it would be impossible to supply it with ore to keep running under the present conditions. The old mill, however, is operating at a reduced rate. The central shaft on the property has been put into use recently and from the time this occurred the men and material have been taken up and down the old shafts while the ore from the mine is being hauled up the new central shaft. This new acquisition to the equipment of the mine has added greatly to the facility with which the handling of the ore is accomplished. According to a statement given out by Mr. N. A. Timmins, president of the company, the mine is in excellent shape, and the plant is operating under the most up-to-date conditions. It is also stated that the ore reserves have been added to considerably since the beginning of the present year. In fact, all that is affecting Hollinger at the present time is the shortage of labor. Recently a minimum wage of \$4.00 was authorized for underground workers, and the men employed at the mine are reported to be well satisfied with the conditions prevailing.

#### Schumacher.

Underground work at the Schumacher mine has been temporarily suspended, owing to the shortage of labor. Construction of the new 140-ton mill is proceeding very satisfactorily at the present time. Within the next six weeks the building will be ready for the installation of the machinery. Providing no delay is experienced in the delivery of the machinery it will not be long before the mill is again working on the higher grade of ore which has been encountered at the lower levels of the mine. In a general way the Schumacher mine is in better condition than ever before, and once operations are again in full swing it should not take long to reflect the improved condition of both the underground workings and the milling equipment which is being installed.

### Dome Extension.

Exploration work on the Dome Extension at Porcupine is still being carried on by the Dome Mines Co., which has an option on the stock of the former company. The work is being conducted in a drift at the 600-ft. level of the Dome Extension where a diamond drilling machine has been set up. The length of the drift from the main shaft of the Dome to where the drilling is going on is about 200 feet. It is the intention of the company to sink a hole 1,400 feet deep from the 600-ft. level. The sinking of this hole will help determine the prospects of finding ore at depth on the property, and the results will be watched with keen interest.

### Dome Lake.

Ore of a good grade is being opened up in a winze which has been sunk 80 feet from the 400-ft. level of the Dome Lake mine and drifting operations are now being carried on. At the point now reached the vein is carrying a good grade of milling ore and is the full width of the drift. The company recently increased the pay of their men 25 cents per day, which brings the wages paid at this property on a par with that obtaining at the McIntyre and Dome mines. About forty men are employed at the Dome Lake.

### Hayden.

Arrangements are being made to explore the Hayden Mining Company's property at Porcupine by diamond drilling. Mr. Wm. Shovel has resigned from the management of the mine and at the present time mining operations are practically suspended.

### Davidson.

A number of diamond drills are at present working on the Davidson Mining Company's property at Porcupine and excellent results are being obtained. Results obtained in a drill hole sunk from the 400-ft. level of the mine were so encouraging that four other drill holes have been sunk from the 300-ft. level of the mine. In two of these new holes orebodies were encountered. One of these drill holes will penetrate the ground to a depth of 1,200 feet.

### Teck-Hughes.

The grade of ore being treated by the new 80-ton mill recently installed by the Teck-Hughes at Kirkland Lake ranges around \$7 to the ton. So far the only ore treated in the mill has come from development work. Later on an effort will be made to establish the average grade of the mine and it is anticipated that the mill heads will be considerably increased when this is done. Orebodies on the property run all the way from a few feet in width to forty feet of ore and as about four thousand feet of underground development has been accomplished, a large tonnage of milling ore has been blocked out. It has been found that the values increase with depth, and the future of the property is considered very promising.

### Elliott-Kirkland.

The shaft at the Elliott-Kirkland mine at Kirkland Lake is being driven to the 300-ft. level. At the 100-ft. level a crosscut was run to tap the vein which is an extension of the Kirkland Lake gold vein, and where encountered the values were not very high; however, this was expected as consistent values did not come in at the neighboring property until the 300-ft. level was reached. Two drills are working on the sinking of the shaft and it is expected the work will be completed within the next three months. The shaft is now down a depth of 190 feet.

### Croesus.

The new ball mill at the Croesus mine in Munro township is now in operation and the production of gold bullion from this remarkably rich property has commenced. Outside of the old mill of the Gold Pyramid which was burned last summer the Croesus is the first mill to operate in the Munro district. The mill has a capacity of about fifty tons a day, the process used being amalgamation and concentration of sulphides. The concentrates will be stored for future treatment. There is a large amount of high grade milling ore on the dump, which it is estimated will run about forty dollars to the ton, and it is safe to say that the Croesus mill heads will be the highest of any mine operating in Northern Ontario.

### Matachewan.

Favorable reports concerning prospect work being carried on in the Fort Matachewan district continue to come in. The formation of the rock is very similar to that of the Kirkland Lake district. On the Otisse claims in Powell township free gold has been found in a large dyke. Work on the Davidson claims is also being energetically prosecuted with very satisfactory results.

### Minaker-Kirkland.

Further work is proceeding on the new vein encountered on the Minaker-Kirkland property at Kirkland Lake. The vein has been opened up for over a hundred feet and two pits have been sunk, in which the vein was found to widen considerably, and the values have also increased. Development work is being vigorously prosecuted. Power has been arranged for from the Lakeshore mine and it is the intention of the company to immediately proceed with the sinking of a shaft.

### Lakeshore.

Development work on the new vein recently discovered at the 200-ft. level of the Lakeshore mine at Kirkland Lake is proceeding and very encouraging results are being encountered and it is said the new vein is one of the most important and spectacular finds made in the north country for many months. Where encountered first the crosscut ran through two wide veins of comparatively low grade ore. Drifting in a westerly direction was started on one of these veins. About 250 feet of drifting has been done and the grade of ore for half this distance is said to average about \$40 to the ton. However, at the present point of working the orebody has widened out to forty feet. It consists of four parallel veins carrying free gold and tellurides. The north wall has been established, but the south wall is still in good ore and it is believed the whole forty feet will average a good grade of milling ore. A considerable amount of high grade ore is already on the dump and with the one thousand tons already there from previous operations on other veins in the mine, there is a considerable tonnage of ore awaiting the completion of the installation of the new 80-ton mill, machinery for which is beginning to arrive at the property.

### Gold Discovery in McElroy.

A discovery of gold of more or less importance has been made on a group of claims situated in McElroy township about three miles from Boston Creek station. The find is said to have been made on a comparatively wide vein which shows free gold and tellurides. The claims belong to Haileybury people, and are about three-fourths of a mile northeast from the Boston Gold Leaf property.

**Skead.**

Growing activity is being manifested in the Township of Skead owing to recent developments there. The latest report of an important find comes from the Simpson claims which are about a quarter of a mile north of the Skead Development Company's property. The Broughtman claims are also reported to be proving up well under development. The two Hart claims on the west side of the Costello claims have been purchased by Mr. H. W. Crawford, of Haileybury.

**Miller-Independence.**

The new mill at the Miller-Independence mine in the Boston Creek, the first mill to be installed in this camp, is now in operation. For a time the tonnage treated will be about 30 tons per day but this will later be increased to fifty tons per day. Underground operations are being pushed vigorously and results are said to be very satisfactory.

**Trethewey.**

Interests closely identified with the Trethewey mining company of Cobalt are understood to have taken an option on a group of claims in the Township of Cane on the Elk Lake branch of the T. & N. O. Railway near Kenabeek Station. Exploration work will be commenced at once. On the surface numerous veins occur in which are found heavy leaf silver, and on one of the claims a shaft has been sunk a depth of fifty feet. The diabase ridge in which the claims are located is about half a mile in width and runs west-southwest from the township of Cane into Auld township, where is situated the Kenabeek mine. On the north claim of the group one vein occurs which is about two feet wide and composed of aplite in which silver occurs. Eighteen men are now at work on the property.

**Peterson Lake.**

A vein about three inches in width containing good grade ore has been cut at the 200-foot level of the Peterson Lake mine at Cobalt. Considerable argentite and ruby silver is in evidence and some of the ore will run fairly high. The vein is thought to be an extension of the No. 10 vein of the Nipissing.

**Adanac.**

Development work at the 310 foot level of the Adanac mine at Cobalt is proving very satisfactory. A vein which runs from three to five inches in width carrying good average values in ruby and leaf silver was recently encountered, and is being drifted on. The vein is in the Keewatin formation which at the present point of operations is close to the diabase sill. A short distance west this formation takes a dip to almost 500 feet and it is in this vicinity that the Adanac expects to obtain good results.

**O'Brien.**

The O'Brien mining company of Cobalt, has posted notices assuring their men of the continuance of the bonus on their wages as long as the price of silver warrants the operation of the mine at a reasonable profit. This announcement was posted following a meeting of the management and the employees of the mine and it is understood to be the intention of other mining companies in the district to give their employees the same assurance that is conveyed in the notice of the O'Brien management to their employees.

**Shamrock.**

Mr. J. C. Hammond, president of the new company which has taken over the Shamrock mine was in town recently and stated that it was the intention of the company to prospect the property at the lower levels,

for which a considerable amount of money was available. Owing to the results obtained on the Beaver mine at the 1600-foot level it is thought the Shamrock also may have good ore beneath the sill in the same formation in which the Beaver and Temiskaming are now getting promising results.

**McKinley-Darragh.**

The construction of the new 200-ton oil flotation plant at the McKinley-Darragh mine is progressing rapidly and it is expected the plant will be in operation by fall. It is just one year since the McKinley-Darragh installed their first oil flotation mill of a capacity of 100 tons per day. The concrete foundations and part of the frame work of the new mill are now in place.

**Mining Corporation.**

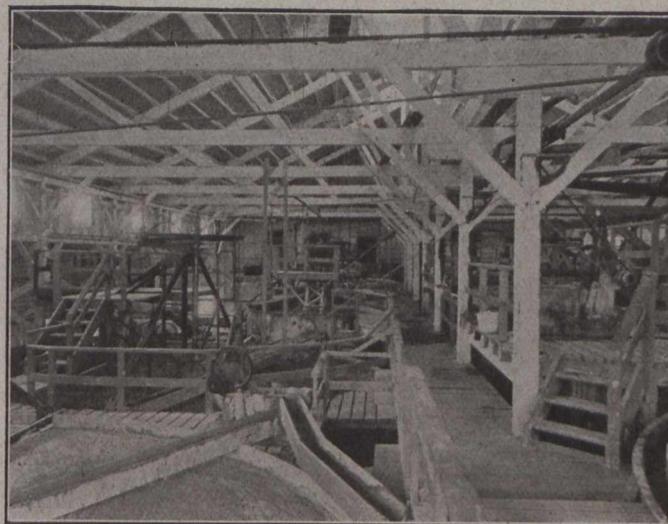
The production of the Mining Corporation of Canada at Cobalt for the first sixteen weeks of the present year has totalled 1,400,000 ounces of silver. Dividends paid by this company up to March 31st total \$1,711,875.

**Nipissing.**

The latest report of the Nipissing Mining Company shows that the company mined during May ore of an estimated value of \$261,668, and shipped bullion from Nipissing and customs ore of an estimated value of \$405,600. There were no important new underground developments recorded during the month; but results from all current work continue to be satisfactory. Drifting on the Cobalt Lake vein has been nearly completed and 1500 feet of the vein has been developed at both the 420 and 520 foot levels. Some new raises are being started and crosscutting is in progress between the vein and the western boundary. Some of the surface dumps are now being removed to the low grade mill for treatment.

**Flies are Busy.**

Owing to continued wet weather throughout the north country and the consequent increase in the black flies and mosquitoes, a great many men who usually spend the summer in the bush prospecting and developing claims, are not doing so this summer. The flies are reported to have become so troublesome in the bush that even the Indian, fortified with the white man's mosquito oil is seeking relaxation from the pests by coming into the town, where flies are not quite so numerous as in the bush.



Tough-Oakes Cyanide Plant, Kirkland Lake.

**COAL AND COKE IN CANADA, 1917.**

The Mines Branch of the Department of Mines has received from the principal coal mine operators returns of their production during the first three months of 1917 on the basis of which the following estimates have been made of total production during this period. According to these estimates, the total production of coal during the first quarter of 1917 was 3,590,991 short tons, comprising 1,233,934 tons in January, 1,143,956 tons in February, and 1,213,101 tons in March. Corresponding records for the year 1916 are not available for comparison.

The record would appear to show that in Nova Scotia and British Columbia the average rate of production was less than the average rate of production during 1916; but in the provinces of New Brunswick, Saskatchewan and Alberta, greater than in 1916.

The exports of coal during the three months were 501,570 tons as against exports of 737,744 tons during the corresponding period of 1916.

The imports of coal during the three months were 3,921,824 tons, as against imports of 4,002,892 tons during the corresponding period of 1916.

The production of oven coke during the first three months of 1917 was 308,690 tons, the imports during the same period being 207,139 tons and the exports 5,606 tons.

**Coal Production, Imports and Exports.****Production in 1916 and 1917.**

	—1917—			
	1916, tons.	January, tons.	February, tons.	March, tons.
Nova Scotia.....	6,912,140	530,696	466,650	432,923
New Brunswick....	143,540	17,117	16,736	17,547
Saskatchewan .....	281,300	36,820	26,820	22,322
Alberta .....	4,559,054	463,158	425,435	449,066
British Columbia...	2,584,061	186,143	208,315	241,243
Yukon .....	3,300	.....	.....	.....
<b>Production .....</b>	<b>14,483,395</b>	<b>1,233,934</b>	<b>1,143,956</b>	<b>1,213,101</b>
<b>Imports.</b>				
Bituminous .....	13,009,788	1,031,719	760,545	1,114,958
Anthracite .....	4,570,815	300,836	277,179	436,567
<b>Total .....</b>	<b>17,580,603</b>	<b>1,332,555</b>	<b>1,037,724</b>	<b>1,551,525</b>
<b>Exports.</b>				
<b>Total exports.....</b>	<b>2,135,359</b>	<b>174,408</b>	<b>120,828</b>	<b>206,334</b>

**Oven Coke Production, Imports and Exports.**

	—1917—			
	1916, tons.	January, tons.	February, tons.	March, tons.
Nova Scotia.....	653,836	53,314	50,127	56,435
Ontario.....	452,502	31,716	26,036	27,680
Alberta .....	42,548	4,390	3,637	3,425
British Columbia...	299,896	10,062	16,802	25,066
<b>Output .....</b>	<b>1,448,782</b>	<b>99,482</b>	<b>96,602</b>	<b>112,606</b>
<b>Imports.....</b>	<b>757,116</b>	<b>49,394</b>	<b>63,849</b>	<b>93,896</b>
<b>Exports.....</b>	<b>48,539</b>	<b>1,960</b>	<b>996</b>	<b>2,650</b>

**COAL AND COKE IN CANADA, 1916.****Revised Statistics and Comparison With 1915.**

Division of Mineral Resources and Statistics, Department of Mines, Ottawa.

Coal.	Calendar Years.	
	1915	1916
Production by Provinces:—	Short tons.	Short tons.
Nova Scotia .....	7,463,370	6,912,140
New Brunswick .....	127,391	143,450
Saskatchewan .....	240,107	281,300
Alberta .....	3,360,818	4,559,054
British Columbia .....	2,065,613	2,584,061
Yukon.....	9,724	3,300
<b>Total.....</b>	<b>13,267,023</b>	<b>14,483,395</b>
Distribution of Coal Production:—		
Sold for consumption in Canada...	9,826,712	10,701,530
Sold for export to United States..	1,330,818	1,451,075
Sold for export to other countries.	297,343	284,513
<b>Total sales.....</b>	<b>11,454,773</b>	<b>12,437,118</b>
Used by producers in making coke, etc.	701,975	804,814
Used by colliery operation and by workmen.....	1,110,275	1,241,463
	1,812,250	2,046,277
Stocks in producers' hands, Dec. 31...	171,205	78,702
Exports (as reported by Customs Dept.)	1,776,543	2,135,539
Imports (as reported by Customs Dept.):		
Bituminous run of mine .....	6,106,794	9,504,552
Bituminous slack .....	2,286,916	3,505,236
<b>Total bituminous .....</b>	<b>8,393,710</b>	<b>13,009,788</b>
Anthracite.....	4,072,192	4,570,815
<b>Total imports .....</b>	<b>12,465,902</b>	<b>17,580,603</b>
Total Canadian consumption of coal..	23,906,692	29,865,856
Used by railway locomotives (years ending June 30th) .....	6,677,536	8,677,354
<b>Oven Coke.</b>		
Coal used in making oven coke.....	1,856,393	2,134,911
Coke Output by Provinces:—		
Nova Scotia .....	584,993	653,836
Ontario.....	316,211	452,502
Alberta.....	24,187	42,548
British Columbia .....	275,375	299,896
<b>Total output .....</b>	<b>1,200,766</b>	<b>1,448,782</b>
Exports.....	35,869	48,539
Imports.....	637,857	757,116

**TAMARACK.**

The last step in the absorption of Tamarack by the Calumet & Hecla was taken last month when the Tamarack offices were closed, the books and records transferred to the Calumet & Hecla offices and a large part of the executive and clerical force of the Tamarack let out or transferred to other properties.

**DR. DALY ON GERMAN BEER.**

Professor Reginald A. Daly of Harvard blames beer for German outrages, and says latter represent the cumulative effect of "mildly alcoholic state" on the minds of men who have imbibed the national drink since childhood. Germanic peoples are the only group who feed alcohol to babies and very young children of the middle and upper classes.

# MARKETS

## SILVER PRICES.

		New York. cents.	London. pence.
June	25.....	78½	39⅞
"	26.....	78	39⅞
"	27.....	78¼	39¾
"	28.....	78½	39⅞
"	29.....	77⅞	39½
July	3.....	77⅞	39½
"	4.....	Holiday	39⅞
"	5.....	78½	38⅞

Tungsten, per unit, \$20.00 to \$22.00.

Silver (official), 78½ cents.

Metal Products—Following quotations represent mill prices and are strictly nominal except in the case of lead sheets and sheet zinc:

### Sheet Copper—

Hot rolled, 39.00 to 40.00 cents.

Cold rolled, 40.00 to 41.00 cents.

(Shipments from stock 2c per pound extra.)

Copper bottoms, 50.00 cents.

Copper in rods (round), 40.00 cents.

Square and rectangular, 41.00 cents.

Copper wire, nominal, 37.00 to 38.00 cents.

Copper wire, July, August, 35.00 to 36.00 cents.

### High Brass—

Sheets, 33.25 to 35.25 cents.

Wire and light rods, 33.25 to 35.25 cents.

Heavy rods, 33.25 to 33.75 cents.

Low Brass—Sheet, wire and rods, 38.75 cents.

### Tubing—

Brazed bronze, 50.25 to 50.50 cents.

Brazed brass, 46.75 to 47.75 cents.

Seamless copper, 45.50 to 48.00 cents.

Seamless brass, 41.00 to 45.00 cents.

Seamless bronze, 54.00 cents.

Full lead sheets, 13.75 cents.

Cut lead sheets, 14.00 cents.

Sheet zinc, f.o.b. smelter, 19.00 cents.

## TORONTO MARKETS.

Cobalt oxide, black, \$1.50 per lb.

Cobalt oxide, grey, \$1.65 per lb.

Cobalt metal, \$2.25 per lb.

Nickel metal, 45 to 50 cents per lb.

White arsenic 15 cents per lb.

July 9, 1917—(Quotations from Canada Metal Co., Toronto)

Spelter, 12½ cents per lb.

Lead, 14 cents per lb.

Tin, 66 cents per lb.

Antimony, 24 cents per lb.

Copper, casting, 34 cents per lb.

Electrolytic, 36 cents per lb.

Ingot brass, yellow, 23 cents; red, 25½ cents per lb.

July 9, 1917—(Quotations from Elias Rogers Co., Toronto)

Coal, anthracite, \$9.50 per ton.

Coal, bituminous, nominal, \$9.00.

## NEW YORK MARKETS.

### Connellsville Coke—

Furnace, spot, \$14.50 to \$15.75.

Furnace, contract, nominal.

Foundry, spot, \$14.50 to \$15.75.

Foundry, contract, nominal.

Straits Tin, spot, f.o.b., 62.50 cents.

### Copper—

Prime Lake, nominal, 30.50 to 31.50 cents.

Electrolytic, nominal, 31.50 to 31.75 cents.

Casting, nominal, 29.25 to 29.50 cents.

Lead, Trust price, 11.00 cents.

Lead, outside, nominal, 11.17½ to 11.42½ cents.

Spelter, prompt western shipment, 9.17½ cents.

### Antimony—

Chinese and Japanese, nominal, 17.00 to 17.25 cents.

### Aluminum—nominal.

No. 1 Virgin, 98-99 per cent., 57.00 to 59.00 cents.

Pure, 98-99 per cent. remelt, 55.00 to 57.00 cents.

No. 12 alloy remelt, 42.00 to 44.00 cents.

Powdered aluminum, 85.00 to 90.00 cents.

Metallic magnesium—99 per cent. plus, \$2.00 to \$2.50.

Nickel—Shot and ingot, 50.00 cents.

Electrolytic, 55.00 cents.

Cadmium, nominal, \$1.45 to \$1.50.

Quicksilver, \$85.00.

### Platinum—

Pure, \$105.00.

10 per cent. iridium, \$110.00.

Cobalt (metallic), \$2.25.

## STANDARD STOCK EXCHANGE.

(Closing Quotations, July 10th, 1917.)

	Silver.	Asked.	Bid.
Adanac .....		.13½	.13
Bailey .....		...	.03¼
Beaver .....		.37½	.37
Buffalo .....		1.37½	1.25
Chambers-Ferland .....		.13	.12½
Coniagas .....		4.50	4.00
Crown Reserve .....		.30	.29½
Gifford .....		.04	...
Great Northern .....		.07½	.06
Hargreaves. . . . .		.10¾	.10½
Hudson Bay .....	40.00		38.00
Kerr Lake .....	4.70		4.50
Kenabeek .....	.17		.16
La Rose .....	.46		.45
Lorrain .....	.16		...
McKinley-Darragh .....	.55		.52
Nipissing .....	...		7.20
Ophir .....	.06½		.06
Peterson Lake .....	.12½		.12
Right of Way .....	.05½		.05
Silver Leaf .....	...		.01¼
Timiskaming .....	.39		.38¼
Trethewey .....	.15		.13½
Wettlaufer .....	...		.05½
White Reserve .....	...		.10
York, Ontario .....	.02		...

Gold.

	Asked.	Bid.
Apex .....	.04 1/4	.04 1/8
Dome Extension .....	.19 1/2	.19
Dome Lake .....	...	.17
Dome Mines .....	...	11.50
Eldorado .....	.02	.01 1/4
Gold Reef .....	.02 1/4	.02
Hollinger Con. ....	4.49	4.47
Inspiration. ....	.05	...
Keora. ....	.12	...
Kirkland Lake .....	...	.36
McIntyre .....	1.58	1.57
Moneta .....	.12	.09
Newray .....	.55	.53
Porcupine Crown .....	.51	.49
Porcupine Gold, xr. ....	.01 1/2	.00 7/8
Porcupine Imperial .....	.02 1/2	.02 1/4
Porcupine Tisdale .....	...	.01 1/2
Porcupine Vipond .....	.32 1/2	.31 1/2
Preston East Dome .....	.05 1/4	.05
Schumacher. ....	.45	...
Teck Hughes .....	.48	...
Thompson Krist .....	.10	.08
West Dome .....	.20	.19 3/4

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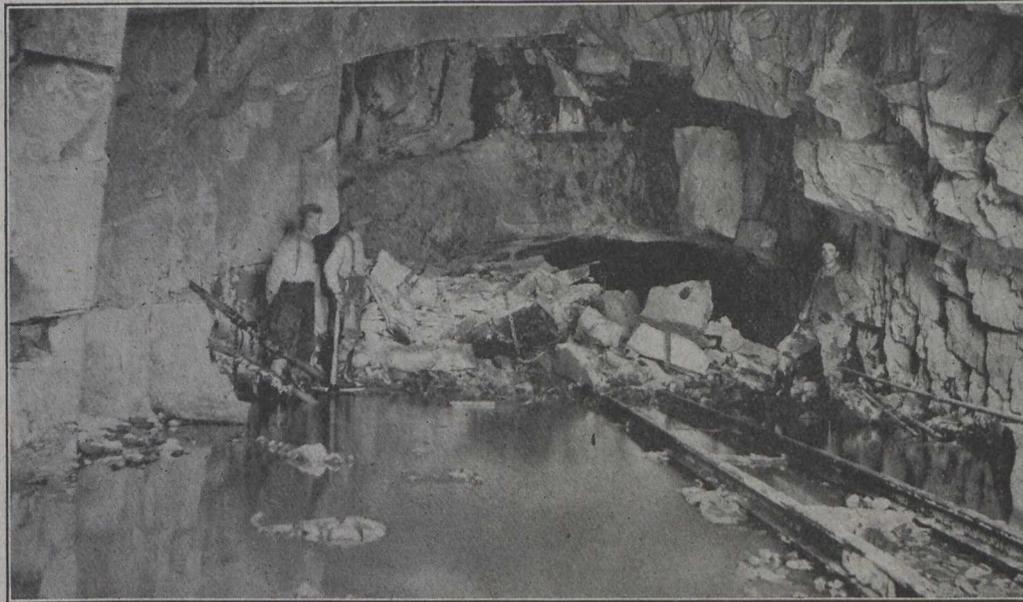
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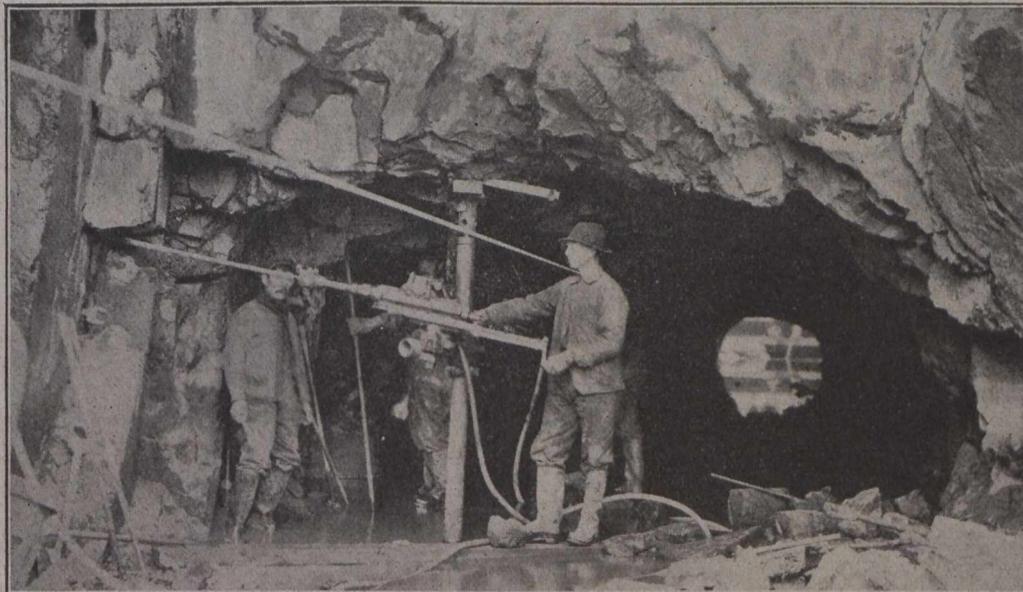
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On December 11, 1916, the SUPREME COURT OF THE UNITED STATES adjudged our basic patent for air-froth flotation to be valid, holding that this patent covers any process of froth flotation wherein the results obtained are secured by the use of a fraction 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 and, at a recent trial in the United States District Court at Butte, Montana, Judge Bourquin admitted these claims as amended.

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.

Prospective users of our flotation processes are earnestly requested not to be misled by the mistaken 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.

### 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.

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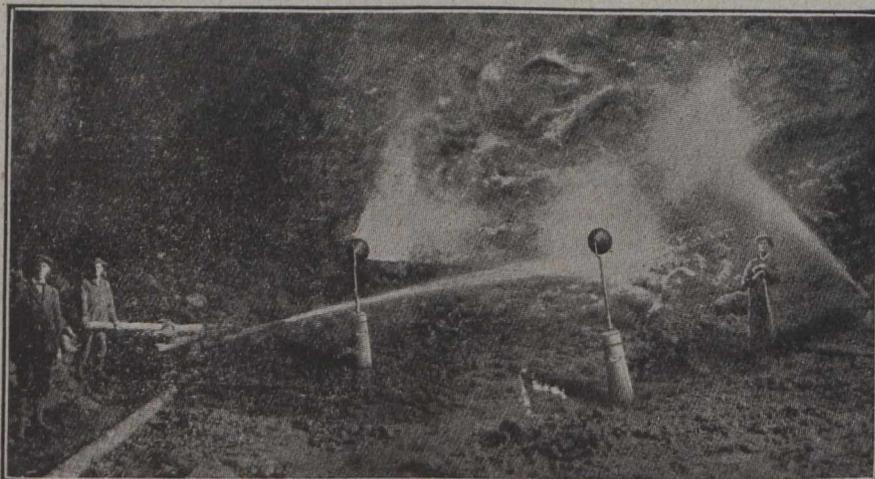
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Hull Iron & Steel Foundries, Ltd.
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Northern Canada Supply Co.  
Jones & Glassco.
- Blasting Batteries and Supplies**—  
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Curtis & Harvey (Canada) Ltd.  
Northern Canada Supply Co.  
Canadian Explosives, Ltd.
- Blowers**—  
Can. Fairbanks-Morse Co.  
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Northern Canada Supply Co.
- Bollers**—  
Can. Fairbanks-Morse Co.  
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Northern Canada Supply Co.  
Can. Ingersoll-Rand Co., Ltd.
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Standard Underground Cable Co. of Canada, Ltd.
- Buckets**—  
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Hendrick Mfg. Co.  
M. Beatty & Sons, Ltd.  
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- Cable—Aerial and Underground**—  
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Standard Underground Cable Co. of Canada, Ltd.
- Cableways**—  
Fraser & Chalmers of Canada, Ltd.  
M. Beatty & Sons, Ltd.
- Cages**—  
Fraser & Chalmers of Canada, Limited.  
Jeffrey Mfg. Co.  
Northern Canada Supply Co.
- Cables—Wire**—  
Standard Underground Cable Co. of Canada, Ltd.
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Sullivan Machinery Co.
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Can. Fairbanks-Morse Co.  
W. Fraser.  
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Northern Canada Supply Co.  
MacKinnon, Holmes & Co.
- Cement Machinery**—  
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Hull Iron & Steel Foundries, Ltd.
- Chains**—  
Can. Fairbanks-Morse Co.  
Jeffrey Mfg. Co.  
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B. Greening Wire Co., Ltd.
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Canadian Laboratories.  
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Thos. Heys & Sons.  
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Northern Canada Supply Co.
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Standard Diamond Drill Co.  
Sullivan Machinery Co.
- Drills—Diamond**—  
Sullivan Machinery Co.  
Northern Canada Supply Co.
- Drill Steel—Mining**—  
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- Drill Steel Sharpeners**—  
Can. Ingersoll-Rand Co., Ltd.  
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- High Speed Steel Twist Drills**—  
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Northern Canada Supply Co.
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Canadian Miners' Buying Directory.—(Continued from page 19.)

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Jeffrey Mfg. Co.  
Northern Canada Supply Co.
- Pumps—Boiler Feed—**  
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Darling Bros., Ltd.  
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Northern Canada Supply Co.  
Can. Ingersoll-Rand Co., Ltd.  
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- Pumps—Electric—**  
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Darling Bros., Ltd.  
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Can. Ingersoll-Rand Co., Ltd.  
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- Pumps—Steam—**  
Can. Fairbanks-Morse Co.  
Can. Ingersoll-Rand Co., Ltd.  
Darling Bros., Ltd.  
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Northern Canada Supply Co.
- Pumps—Turbine—**  
Can. Fairbanks-Morse Co.  
Darling Bros., Ltd.  
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Allan, Whyte & Co.  
Northern Canada Supply Co.  
Fraser & Chalmers of Canada, Limited.
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Ledoux & Co.  
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- Separators—**  
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Smart-Turner Machine Co.
- Sheet Lead—**  
Canada Metal Co., Ltd.
- Sheets—Genuine Manganese Bronze—**  
Hendrick Mfg. Co.
- Shovels—Steam—**  
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W. Fraser.
- Smelting Machinery—**  
Fraser & Chalmers of Canada, Limited.
- Stacks—Smoke Stacks—**  
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Hendrick Mfg. Co.  
MacKinnon, Holmes & Co.
- Stamp Mills—**  
Fraser & Chalmers of Canada, Limited.
- Steel Barrels—**  
Smart-Turner Machine Co.
- Steel Drills—**  
Sullivan Machinery Co.  
Northern Canada Supply Co.  
Can. Ingersoll-Rand Co., Ltd.
- Steel Drums—**  
Smart-Turner Machine Co.
- Steel—Tool—**  
N. S. Steel & Coal Co.  
Armstrong, Whitworth of Can., Ltd.
- Surveying Instruments—**  
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C. L. Berger.
- Tanks—Cyanide, Etc.—**  
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Hendrick Mfg. Co.  
Pacific Coast Pipe Co., Ltd.  
MacKinnon, Holmes & Co.
- Tipples—**  
Roberts & Schaefer Co.
- Transits—**  
C. L. Berger & Sons.
- Tube Mills—**  
Fraser & Chalmers of Canada, Limited.
- Turbines—**  
Escher Wyss & Co.  
Fraser & Chalmers of Canada, Limited.
- Valves—**  
Can. Fairbanks-Morse Co.
- Winding Engines—**  
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- Wire Cloth—**  
Northern Canada Supply Co.  
B. Greening Wire Co., Ltd.
- Wire (Bare and Insulated)—**  
Standard Underground Cable Co., of Canada, Ltd.
- Zinc Spelter—**  
Canada Metal Co., Ltd.

ALPHABETICAL INDEX TO ADVERTISERS

<b>A</b>	Dominion Engineering & Inspection Co. . . . .	15	Lindsey, G. G. S. . . . .	15
Allan, Whyte & Co. . . . .	Dominion Steel Foundry, Ltd. . . . .	3	Longyear, E. J. Co. . . . .	4
American Zinc Lead & Smelting Co. . . . .	Dorr Co. . . . .	15	Lymans, Ltd. . . . .	6
Armstrong, Whitworth of Can., Ltd. . . . .	Dwight & Lloyd Sintering Co., Inc. . . . .	7	<b>M</b>	
Aspinall, J. Stanley . . . . .	<b>E</b>		MacKinnon, Holmes & Co. . . . .	
<b>B</b>	Escher, Wyss & Co. . . . .	16	Manville Asbestos Co. . . . .	16
Bath, Henry & Son . . . . .	Eustis Mining Co. . . . .	16	Minerals Separation North American Corporation . . . . .	13
Balbach Smelting & Refining Co. . . . .	<b>F</b>		Mond Nickel Co. . . . .	4
Beatty, Blackstock, Fasken, Cowan & Chadwick . . . . .	Foster, W. L. Co. . . . .	14	Murphy, Chas. J. . . . .	15
Beatty, M. & Sons. . . . .	Ferrier, W. F. . . . .	15	Mussens, Ltd. . . . .	10
Berger, C. L. & Sons . . . . .	Fleck, Alex. . . . .	9	<b>N</b>	
Blackwell, Geo. G., Sons & Co. . . . .	Foundation Co. of Montreal . . . . .	11	Northern Canada Supply Co., Ltd. . . . .	7
British Columbia, Province of . . . . .	Fraser & Chalmers of Can., Ltd. . . . .	16	Nova Scotia Steel & Coal Co. . . . .	4
Buffalo Mines, Ltd. . . . .	Fuller, A. S. & Co. . . . .	16	Nova Scotia Government. . . . .	8
<b>C</b>	<b>G</b>		<b>O</b>	
Campbell & Deyell, Ltd. . . . .	Gartshore, John J. . . . .	15	Ontario, Province of . . . . .	
Canadian Explosives, Ltd. . . . .	General Engineering Co. . . . .	16	Inside Back Cover	
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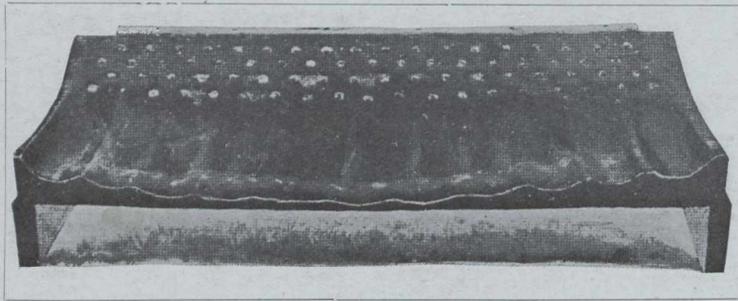
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