

# THE CANADIAN MINING JOURNAL

VOL. XXXVIII.

TORONTO, December 15th, 1917.

No. 24

## The Canadian Mining Journal

With which is incorporated the  
"CANADIAN MINING REVIEW"

Devoted to Mining, Metallurgy and Allied Industries in Canada.

Published 1st and 15th of each month by the  
**MINES PUBLISHING CO., LIMITED**

Head Office . . . . . 263-5 Adelaide Street, West, Toronto  
Branch Office . . . . . 600 Read Bldg., Montreal

Editor: REGINALD E. HORE, B.A. (Toronto).

1917.

### SUBSCRIPTIONS.

Payable in advance, \$2.00 a year of 24 numbers, including postage in Canada. In all other countries, including postage, \$3.00 a year.

Single copies of current issue, 15 cents. Single copies of other than current issue, 25 cents.

The Mines Publishing Co. aims to serve the mining industry of Canada by publication of reliable news and technical articles. This company publishes the Canadian Mining Journal twice a month and the Canadian Mining Manual once a year.

### ADVERTISING COPY.

Advertising copy should reach the Toronto Office by the 8th for issues of the 15th of each month, and by the 23rd for the issues of the first of the following month. If proof is required, the copy should be sent so that the accepted proof will reach the Toronto Office by the above dates.

### ADVERTISING.

The Canadian Mining Journal covers the Canadian mining field. Ask for advertising rates.

### 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."

Editorial	Page
Progress in 1917 .....	473
Status of Oil Flotation Patent Litigation .....	473
Misleading Report of Committee on Public Printing .....	474
The Munition Resources Committee's Circular ....	475
Metal Mining in Manitoba in 1917, by E. L. Bruce ....	476
Iron and Steel in Canada in 1917 .....	477
Expansion of Ontario's Gold Mining Industry .....	478
Nickel, by E. P. Mathewson .....	480
A Successful Year for Cobalt Silver Mining Companies .....	483
Groch Centrifugal System of Flotation .....	488
Rich Silver Ore from Cobalt, Ontario, (with illustrations in color) .....	486
Special Correspondence .....	489
Markets .....	494

## THE MINERALS SEPARATION N. A. CORPORATION.

In our issue of Nov. 1, we pointed out the urgent necessity of an investigation of the Minerals Separation corporations and their connection with the American branch of the German firm, Beer, Sondheimer & Co. Fortunately, the matter has already been given serious attention by the Government as a result of the activity of the Timiskaming Mine Managers Association.

In this investigation it is well to bear in mind that Beer, Sondheimer & Co. is an alien enemy firm of very dangerous character. An investigation of any firm connected with it in any way should be very thorough. It should be carried on by competent and trustworthy officers until the whole truth is disclosed.

The year has seen great activity in mining. Shortage of labor and high cost of machinery and supplies of all kinds, has been offset by a great demand and good prices for mine products. When the final figures are available it will be shown that the value of Canada's mine products made new records in most cases, while in some there has been an increase in quantity also. In this issue will be found a number of articles reviewing the progress in various districts.

In a period of high prices, gold mining naturally suffers; but even under these circumstances we are able to record great development in this industry. Profits have fallen and payments of dividends have been suspended; but at the mines results have been obtained that assure a wonderful future.

Silver mining companies have at last received what is considered a fair price for silver, and the shortage of the supply indicates that good prices will obtain for some time. This adds materially to the profits and will greatly lengthen the life of the silver mines at Cobalt. The successful introduction of the flotation process has also done much for the silver mining companies, by providing an excellent method of recovering silver from low grade ore and old tailings.

Copper and nickel have continued in great demand. The price of nickel has been advanced slightly. The price of copper has been fixed at a figure which is generally considered fair. The mining of these two metals, so essential for munitions, has been carried on energetically. The refining of nickel in Canada in large quantities has not yet started, but the big plant of the International Nickel Co., at Port Colborne is nearing completion.

Lead and zinc production has been large during the year and a considerable quantity of refined zinc has been shipped from the new plant at Trail. Owing to over production in the United States the price of lead has fallen greatly and in British Columbia there has lately been a set back owing to difficulty in selling the metal.

The mining of molybdenite has become a much more important industry during the year; but natural development is hampered by an embargo which prevents the sale of molybdenite in the open market. It is to be hoped that this embargo will soon be removed. When it is removed a much larger production will be possible, for much higher prices can be obtained in the United States than in Canada.

The great demand for iron and steel has resulted in large increase in production at Canadian plants, but the production of iron ore continues to be only a small fraction of the amount used in Canadian furnaces.

Owing to labor shortage in coal mining districts and to strikes in western districts the production of



coal has been much less than is desirable. We have enormous supplies of coal in the East and West. It is unfortunate that we are not using them to better advantage.

Asbestos mining has been carried on with good results during the year. The demand for sulphuric acid has been reflected by great activity at the pyrites mines in Quebec and Ontario.

There has been a good demand during the year for such minerals as graphite, fluorspar, chromite, feldspar and magnesite. The great consumption of oil is encouraging operators to explore new territory.

There has been during the year a greater appreciation of the fact that our basic industries are of vital importance during the war and it seems likely that efforts to increase production will meet with more than usual encouragement in the coming year.

#### THE MISLEADING REPORT OF THE COMMITTEE ON PUBLIC PRINTING.

As our readers are well aware, the United States Geological Survey has been sending out a very large number of reports on mineral deposits during the past year. There never was a time when these reports were more useful. In view of the facts is it not surprising that the Committee on Public Printing reported to the House in part as follows:

"Economy will have to be Canada's watchword for many years to come, and the printing bills of Parliament and the Public Departments present a fertile field for action in this regard. That our great neighbors to the South realize this in connection with Congressional publications is shown by the decision of the Senate of the United States to cut down this year its printing bills by \$470,000. This has been brought about by reducing the bulk of some reports and suspending entirely the publication of others. Among the latter may be mentioned:—Monthly Summary of Foreign Commerce, Annual Report of Foreign Commerce and Navigation, Report of District of Columbia Health Office, Bulletins of the Bureau of Ethnology, annual report, ditto; Bulletins of the Bureau of Fisheries, Geological Bulletins, Geological Professional papers, Geological Water Supply papers, Memoirs of the National Academy of Sciences, Nautical Almanac, Annual report of the Bureau of Soils and many others."

It is quite true, as we have pointed out before in these columns, that there is waste in Public Printing; but it is just as true that this Committee completely distorted the facts. No such measure as the Committee referred to is in operation in the United States. A bill providing for decrease in allotment for printing did pass in the Senate; but that measure did not aim to suspend the publication of the reports mentioned; but provided only that the Congressional edition should be discontinued. That is, members of Congress were not to be given copies for distribution; but the regular distribution by departments was to be continued.

Even this proposal failed to pass the House and is not in operation. Under the circumstances the report of the Committee was very misleading and little nearer the truth than other statements of the Committee to which we referred in our last number.

In the December 1 issue of "Engineering and Mining Journal" there is an excellent article on flotation patent litigation in the United States. The author, Mr. R. C. Canby, is thoroughly conversant with the subject and writes with authority. His article should be carefully read. It is not likely that Canadians will have to study this matter so carefully as have our American friends; but they will find Mr. Canby's article very enlightening.

In Canada it seems probable that litigation between flotation patent owners and mining companies will be avoided by Government action. If it should be proved that the Minerals Separation corporations are controlled by Germans, our American friends will also be relieved of a burden. In any event we expect that Canadian mining companies will be able to avoid costly litigation and unreasonable royalties.

It is unfortunate that in order to have the matter of our mineral resources more carefully considered, we had to include Mr. Mackenzie in our criticism of the Munition Resources Commission. Mr. Mackenzie is a member and secretary of the Munition Resources Commission and he naturally resents what we have said about the folly of asking the Commission to undertake work for which it is not qualified. Mr. Mackenzie would be a valuable member of a Committee on War Minerals, but that does not mean that the Munition Resources Commission is a competent Committee on War Minerals. The members of that Commission would probably undertake anything, if Mackenzie would offer to do the work, that would help to win the war; but that does not mean that good results would be obtained.

The necessary men for a real War Minerals Committee are available and the machinery is in good working order. Mr. Mackenzie showed good spirit in undertaking this work and merits praise rather than criticism for his part in it. It is, however, an unnecessary burden and the Commission should be glad to get rid of it. As a member of a real War Minerals Committee Mr. Mackenzie could well present the views of the Commission.

There is, of course, something in what Mr. Mackenzie says about the possibility that good will result from these circulars, for the unearthing of information that would lead to the operation of even one property is worth considerable effort. We hope that some such result may be obtained; but we believe that much more might be done by a properly qualified committee which would use the machinery that exists, instead of creating new machinery for every new idea.



## CORRESPONDENCE

**DIFFERENCES BETWEEN CANADIAN AND U. S. PATENT LAWS.**

Editor Canadian Mining Journal:

Sir,—Your issue of the 1st inst. contained an interesting little article by Wm. Rich on Patents. While most of it applies equally well to Canadian patents as to United States, we desire to call attention to one point which it is very important for Canadian patentees or would-be patentees to keep in mind. While the United States allows an inventor to have his invention in public use in United States for two years prior to the date of his application, Canada only allows an inventor to have his invention in public use for one year prior to the date of his application for a patent. Further, under the United States patent act, public use by the inventor abroad has no bearing on his right to obtain a patent on his invention in United States. Under our Canadian act, public use with the knowledge or consent of the inventor anywhere in the world for more than one year prior to the date of his application for patent in Canada would prevent him obtaining a valid Canadian patent.

Yours, etc.,

Toronto, Dec. 10, 1917. RIDOUT & MAYBEE.

**THE MUNITION RESOURCES COMMISSION CIRCULAR.**

The following letter appears in the December bulletin of the Canadian Mining Institute:

To the Editor,—In its issue for November 15th, the Canadian Mining Journal expatiates at some length on the subject of the Canadian Muniton Resources Commission with regard to its recent circularization of Canadian mining engineers and geologists with the view of assembling information regarding certain minerals that are or may be required during the present strenuous times.

The Canadian Mining Journal is evidently ignorant of the fact that this work was undertaken by the Commission at the request of the Secretary of the Canadian Mining Institute who had received a communication from Mr. Bradley Stoughton, of the American Institute of Mining Engineers, asking the co-operation of the Institute with the War Minerals Committee of the United States to the end that the mineral supplies of North America could be indexed effectively in order that information of a special character might immediately be available if required, having regard to the abnormal demand for certain metals and metal products. The Commission accepted this work after some correspondence with the Secretary of the C.M.I., in the course of which correspondence it was pointed out that the Commission had better facilities for conducting this investigation than the Canadian Mining Institute, and that in order to avoid duplication of effort this work in any case should properly be entrusted to the Commission. Before taking any action in the matter the subject was discussed with several members of the staff of the Department of Mines at Ottawa, and while it was fully recognized that possibly 90 per cent. of the information desired could be obtained from both Federal and Provincial publications, it was decided to proceed with the suggestion of the War Minerals Committee on the grounds that the securing of information that would lead to the operation of even one or two mineral deposits would fully justify the trouble and expense undertaken by such circularization.

The Canadian Mining Journal has apparently assumed that the Muniton Resources Commission was attempting to duplicate the work of the Department of Mines and the various Provincial Bureaux with the view of making separate publications of its own findings. Such, however, is not the case. The Commission has no intention of over-lapping the work accomplished by the Federal Department or the various Provincial Bureaux, but rather intends to hand over to the Federal Department all information in its files which may possibly be made use of in future Departmental publications.

The Canadian Mining Journal makes the statement that the Department of Mines has collected information concerning all known important mineral deposits, but it fails to grasp the point that the Commission while fully aware of the truth of this statement is inquisitive as regards certain unknown and what may possibly prove to be important mineral deposits.

To what end is the Canadian Mining Journal making argument? Because the United States possess deposits of soluble phosphate are we, therefore, to ignore the possibilities of discovery in this country? Why continue any search for Canadian iron ores? There are large deposits of iron ore in Michigan and Minnesota. The nickel-copper industries of Sudbury do not manufacture sulphuric acid from their waste gases, not because there is no market for acid but because there is no market for acid that might be produced at the cost of reclaiming the waste sulphur gases at Sudbury.

It is quite within the range of possibility that some nice little tin mine may be hidden in the Canadian bush, but it will never be discovered through consultation of the present records at Ottawa or the various Provincial Bureaux.

But why argue further? The Canadian Mining Journal either cannot understand or will not take the trouble to inquire, and, therefore, one is forced to the conclusion that the War Minerals Committee of the United States and this Commission made an unfortunate mistake in attempting the inquiry as regards the mineral deposits without previous consultation with the Canadian Mining Journal.

In drawing up the circulars issued by this Commission it may be a matter of regret that the Canadian engineers and geologists were advised to supply only such information as in their opinion would not be found in the various Government publications; but at the time the circulars were issued it was considered that the men to whom they were addressed would use discrimination in this particular.

A great deal of discussion has taken place recently in the columns of the Canadian Mining Journal on the subject of a certain phosphate deposit in British Columbia and some capital has been made of the point that a report made for private interests concerning this deposit had fully covered the ground prior to the investigation of this field by public officials. Would the Canadian Mining Journal argue that this particular instance of mineral investigation for private interests without the knowledge of Government officials be an isolated case unlikely to re-occur at some future date? The whole subject of mineral investigation within the Dominion carried on by Government Departments, Commissions, and various private interests would form a most interesting subject of discussion at the forthcoming meeting of the Institute next March.

GEO. C. MACKENZIE,

Member and Secretary, Muniton Resources Commission.

Ottawa, Nov. 22, 1917.



### Metal Mining in Manitoba in 1917\*

By E. L. Bruce.

During the year 1917 the province of Manitoba made its first important contribution to the Canadian metal mining industry. Two districts, both in the same belt of basic Pre-Cambrian rocks, are responsible for practically all the production. One of these, known as the Schist lake area, lies very close to the western boundary of the province, about 50 miles north of the Saskatchewan river. The other, the Herb or Wekusko lake area, is further east. The lake lies 11 miles northwest of Mile 82 north of The Pas on the Hudson's Bay railway.

At Schist lake, chalcopryrite with some gold is being mined. At Herb lake, development is on gold quartz veins.

#### The Mandy Mine.

The Schist lake sulphide deposit, now known as the Mandy, was discovered very late in the season of 1915 and immediately optioned by the Tonopah Mining Company, whose representative happened to be investigating other prospects in the district. During 1916 diamond drills were running continuously. By the end of the year those in charge had decided that the deposit was worth working. A contract was made with Mr. C. Morgan to haul ore from the Mandy to Sturgeon lake during the winter. The orebody was open cut and before the ice on the lakes broke up 3,500 tons was hauled to Sturgeon lake and two carloads were taken to The Pas.

Equipment for underground work was brought in on the ice and installed. This consists of a 125 h. p. boiler, a 7 drill compressor, a hoist and a portable sawmill to saw lumber for the mine buildings. A sixty-ton tug to handle barges during the summer, was hauled across from Sturgeon lake to Athapapuskow lake. Four 40-ton barges were built to transport the ore from Sturgeon lake down the Saskatchewan to The Pas, and four barges for the summer production on the Upper lakes, two on Athapapuskow and two on Schist lake. A small stern wheel steamer was also built for use on Schist lake. Low water for most of the season prevents barges coming from Schist lake to Athapapuskow, but it is hoped that by means of a lock in Schist creek this difficulty can be overcome. One gate of this lock is already in position. Ore can then be loaded directly into the barges at the mine and taken to the south side of Lake Athapapuskow only 17 miles from the head of Saskatchewan river navigation, whereas at present it must be hauled on sleighs double that distance.

During the spring and early part of the summer a vertical shaft was sunk, a station cut at 100 ft., and a crosscut driven 50 ft. to the ore. During the latter part of the summer, ore was hoisted from a stope at this level. The ore is hoisted directly to a tramway and dumped into a small ore pocket from which the barges are loaded. These are then towed 10 miles down the lake and the ore piled. It was estimated that 2,000 tons would be stocked there by the time that ice would prevent further transportation.

After the closing of the lake it is intended to sink the shaft another hundred feet so that ore can be broken on two levels. A contract for hauling 7,500 tons of ore this winter has been signed. This ore runs 19 per cent. copper with a trace of gold, making the

1917 production worth \$325,000 to \$350,000, depending on the price of copper.

#### Transportation Difficulties.

Under present transportation conditions only exceptionally high grade mineral can be handled at all. The ore can be brought to Sturgeon lake only during the winter, and from there to the railroad only during a short summer. Moreover, navigation on the Saskatchewan is not always certain on account of low water in Cumberland lake.

During 1914 and 1915 a government dredge worked on the bar, forming at the outlet of the lake, and excavated a channel for shallow draft boats. For the last two years, however, nothing has been done and during the last part of the past season boats, even though specially built to draw only 2½ feet of water, could not get out into the lake. As a result 200 tons of ore mined in 1917 still lies at Sturgeon lake. Summer transportation except by water is almost impossible.

The Provincial Government last winter undertook to make a road 17 miles in length from Sturgeon lake to Athapapuskow lake, but owing to lack of an adequate appropriation and lack of labor, work was slow and the road was not ready for use until navigation was practically closed. Thus all supplies brought in during the summer had to come from the head of river navigation by slow and costly canoe transportation.

It would seem that larger grants for roads in this section should be made by the province, for even though the public lands are under Federal control the development of an active mining industry would be a direct benefit to the business men of the province.

During the past year ore after reaching The Pas had to be hauled some distance by wagons, as there is as yet no spur from the railway to the waterfront. Under such handicaps it speaks well for the management of the Mandy mine that so considerable an amount of ore has been sent out in the short time since the discovery of the orebody. The difficulties of transportation prevent the mining of the lower grade chalcopryrite and the considerable amount of zinc-blende that occurs with the high grade chalcopryrite.

#### Flinflon.

During the summer diamond drills were working at Flinflon, four miles northwest of Schist lake, on the original discovery of sulphide ore in this district. This orebody is larger than that at Schist lake, but is lower grade and the minerals are not segregated as they are in the smaller body. Hence, under present conditions, production from this deposit cannot be expected. Some other smaller prospects are under development, but none of these are yet important.

#### Herb Lake.

At Herb lake\*, activity is as yet largely confined to development work on gold-bearing quartz veins. At the Rex a shaft is down 120 ft. and a mill is being installed. There are also shafts on the Kiski claim and on the claims of the Northern Mining & Development Company. Shafts are being sunk on the McCafferty vein and on the Elizabeth. From the quartz taken out of the shaft of the Northern Manitoba Mining & Development Company a shipment of 57,000 pounds worth \$2,323 was made. This is the only actual production from the district during the year. A road has been built from Mile 82, Hudson's Bay railway, to the south end of Herb lake, a distance of eleven miles.

\*Published by permission of the Director of the Geological Survey.



The problem of transportation is only one of the difficulties that must be overcome in this new area. There is a great lack of experienced men both for actual mining work and for prospecting. Much of the country is as yet inadequately represented on any maps and as a result the few real prospectors have had to do a great deal of exploration work themselves. The one line method of staking and the holding of undeveloped ground done to the extension of the period for the completion of assessment work have also been serious drawbacks to the opening up of the country. That so large an amount of ore has been brought out in spite of all these difficulties is an indication of what may be expected when conditions become more favorable.

**Copper and Gold Production of the New Fields in Manitoba.**

The following is an approximate summary of the production during 1917:

Copper—Shipped to Trail smelter, 3,500 tons 19% Cu.; value, calculated at 25 cents per pound, \$332,500; ore stocked, 2,000 tons.

Gold—Shipped, 28½ tons; value per ton, \$81.23; total value, \$2,323.

**TO CONTROL DEALING IN METALS.**

London, Dec. 12.—The Non-Ferrous Metal Bill, which gives the Government control of all dealings in metals not containing iron and is intended to destroy what hitherto had been a virtual German monopoly in these metals, was passed on the second reading by the House of Commons last night. The bill has been criticized strongly inside and outside of Parliament.

In the course of the debate, Andrew Bonar Law, Chancellor of the Exchequer, said he wished to let Germany know that Great Britain realized her power commercially and that when the time came she should use it.

Germany should also remember, he said, that the longer the war lasted the less raw material there would be to go round, and the allies would help themselves first.

**DIVIDENDS PAID BY COBALT SILVER MINING COMPANIES.**

Commenting on the Remarkable Record of Cobalt Dividends, Mark Harris says:

The record of Cobalt dividends for the year to date is conclusive evidence of the remarkable prosperity which is being enjoyed by the producing mines of the camp. Dividends already declared for 1917 amount to \$5,454,646, as compared with \$4,967,079 in 1916, and \$4,350,526 in 1915. This is an increase of \$487,567 or close to 10%, over last year and of \$1,104,120, or nearly 30%, as compared with two years ago.

	1917.	1916.
Alladin .....	\$ 50,000	\$ .....
Beaver .....	.....	60,000
Coniagas .....	300,000	600,000
Crown Reserve .....	88,441	.....
Kerr Lake .....	690,000	600,000
La Rose .....	299,725	299,725
McKinley .....	269,723	269,723
Mining Corp. ....	1,556	570,615
Nipissing .....	1,800,000	1,500,000
Peterson Lake .....	42,032	168,128
Right of Way .....	8,428	25,283
Sen. Superior .....	.....	598,605
Temiskaming .....	300,000	225,000
Trethewey .....	50,000	50,000

**IRON AND STEEL IN CANADA, 1917.**

**January to September.**

The Mines Branch of the Department of Mines, Ottawa, has received from the producers complete returns of the production of pig iron in Canada and with the exception of two small plants complete returns of the production of steel ingots and direct steel castings during the first nine months of 1917.

The total production of pig iron during the first nine months was 895,307 short tons, as against 844,717 tons during the first nine months of 1916. The average monthly production in 1917 was 99,478 tons, as against an average monthly production throughout 1916 of 97,438 tons.

Furnaces were in blast at Sydney and North Sydney, Nova Scotia, Hamilton, Port Colborne, Sault Ste. Marie, and Deseronto, Ontario. Small quantities of pig iron were also produced in electric furnaces from scrap steel at Orillia, Collingwood, St. Catharines, Toronto, Ontario, and at Montreal, Quebec. The total quantity of pig iron thus produced in electric furnaces during the nine months was 9,983 short tons.

The total production of steel ingots and direct castings during the first nine months was 1,265,183 short tons, as against 911,054 tons during the first nine months of 1916. The average monthly production during the first nine months of 1917 was 140,576 tons as against an average monthly production throughout 1916 of 106,268 tons.

The production of steel in electric furnaces included above was 30,960 tons during the first nine months of 1917 as against a total of 19,639 tons produced throughout 1916. The production of steel in electric furnaces in September was over 5,000 tons or at the rate of over 60,000 tons per annum.

The monthly production—exports and imports during 1916 and 1917, are shown in the accompanying

tables.	Production.		Exports.		Imports.	
	1916.	1917.	1916.	1917.	1916.	1917.
January ...	\$62,097	\$9,187	1,625	106	4,450	5,472
February ...	monthly 33,801	.....	1,393	732	4,101	3,503
March ...	average 103,739	.....	2,725	1,324	5,603	7,442
April ...	of 101,594	.....	30	429	5,963	5,916
May ...	\$3,683	\$08,799	30	964	6,489	7,189
June ...	.....	\$9,853	221	1,483	3,190	9,324
July ...	\$2,012	\$7,047	394	1,223	6,773	7,413
August ...	\$7,844	\$10,624	3,902	1,085	3,961	5,624
September ..	\$12,744	\$100,433	1,524	1,998	5,001	1,948
October ...	\$13,403	.....	4,344	.....	5,933	.....
November ..	\$104,436	.....	4,056	.....	3,310	.....
December ..	\$106,436	.....	2,991	.....	4,351	.....
<b>Total ..</b>	<b>1,169,257</b>	<b>.....</b>	<b>33,204</b>	<b>.....</b>	<b>58,130</b>	<b>.....</b>
Monthly Average ..	97,438	99,478	1,942	1,095	4,919	4,982

**Steel in Canada.**

	Production of Steel Ingots and Direct Steel Castings.		Exports.**		Imports.*	
	1916.	1917.	1916.	1917.	1916.	1917.
January ...	589,553	130,930	.....	.....	4,212	13,328
February ...	monthly 120,629	.....	.....	.....	7,288	15,218
March ...	average 152,420	.....	.....	.....	5,206	32,599
April ...	of 139,669	.....	.....	4,372	10,877	19,793
May ...	\$3,259	\$55,346	.....	4,611	8,543	36,326
June ...	.....	\$37,695	.....	5,788	11,368	31,700
July ...	100,817	137,531	.....	7,203	10,742	6,761
August ...	107,373	144,348	.....	5,405	13,413	4,736
September ..	113,411	147,260	.....	4,736	10,433	.....
October ...	123,463	.....	.....	.....	12,958	.....
November ..	124,421	.....	.....	.....	12,723	.....
December ..	116,245	.....	.....	.....	10,309	.....
<b>Total ..</b>	<b>1,275,219</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>	<b>118,070</b>	<b>.....</b>
Monthly Average ..	106,368	140,576	.....	5,386	9,839	16,772

\*\*Exports of ingots, or billets, not separately recorded previous to April 1917.

\*The figures given hereunder represent the exports of steel, ingots and billets from the United States to Canada and Navigation of the United States." Washington, D.C. The total exports to Canada during the eight months ended August 31, 1917, were 180,348 short tons valued at \$10,870,733.



### Ontario's Gold Mining Industry Expanding

During the year 1917 wonderful expansion has taken place in the gold area of Porcupine and of Kirkland Lake. The production of gold throughout the year has averaged about three-quarters of a million dollars per month, despite the serious shortage of efficient labor. In addition to maintaining this large production, a number of companies have installed or begun to install new mills, and others have been adding to their former equipment.

#### Milling Capacity Increased.

Notable among the new installations is the Hollinger Consolidated, where a unit with a capacity for treating an additional 1,000 tons per day has been installed. The McIntyre-Porcupine has increased its capacity to nearly 600 tons daily as compared with about 400 tons one year ago. The Schumacher has added to its equipment and is now treating about 180 tons per day as compared with 120 tons at the beginning of the year. In the Kirkland Lake field the Teck-Hughes commenced production several months ago with an 80-ton mill and is now making arrangements for doubling its capacity. The Lake Shore is being equipped with an 80-ton mill and early in the new year will be producing gold. The foundations and preliminary work for the installation of a 150-ton mill at the Kirkland Lake Gold Mines, Limited, is under way and by the spring of 1918 should be in an advanced stage of completion. The Croesus mine in Munro township has been equipped with a 50-ton mill which is now in full operation. The Miller Independence at Boston Creek has installed a 35-ton mill and, applying successfully the oil flotation process in the recovery of gold from its ore. Several other properties have been developed to a point where milling equipment would appear to be soon warranted.

#### Much Development Work Done.

In addition to producing gold amounting to about \$9,000,000 during the year, and carrying out the huge construction programme, the gold mining companies of Northern Ontario have conducted development work at a rate unprecedented in the history of mining in Canada. Thousands of men are employed, and thousands of feet of underground work consisting of drifting, crosscutting, sinking, stoping, etc., is being carried on monthly. Indeed at the Hollinger alone upwards of one mile per month of such work has been carried on. Developments have been carried to nearly one-quarter of a mile in depth at the Hollinger, the McIntyre Porcupine, the Porcupine Crown, and even now it is understood preparations are being made for the development of the Dome Mines to a depth of about 1,500 feet. Among other properties with shafts to a depth of 500 feet or more are the Schumacher, the Porcupine V. N. T., the Kirkland Lake Gold Mine, Teck-Hughes, and Tough-Oakes.

#### Ore Reserves Increased.

Ore reserves in the aggregate during the past twelve months have probably increased about twenty-five per cent. over that of the beginning of the current year. Porcupine and Kirkland Lake may be roughly estimated to have perhaps \$80,000,000 in ore reserves. In fact it would not be surprising were the whole to total an even larger aggregate. In the Porcupine camp, perhaps the most important developments for the year have taken place at the Hollinger and at the McIntyre. At the former, the development of the

rich vein No. 58 disclosed a long ore shoot containing average values of upwards of \$50 per ton over a width of about twelve feet. Only one month ago on the Miller Middleton side of the property an orebody measuring approximately 71 ft. in width and containing almost one and one-half oz. of gold per ton was opened up. This orebody on surface is understood to have contained values of between only \$4 and \$5 per ton. However, at the present depth of 400 ft. the deposit appears to constitute the highest grade gold orebody ever encountered in the world. At the McIntyre, the developments at the 1,000-ft. level have also been little short of sensational. Here a huge ore deposit measuring in places as much as 58 ft. in width has been opened up for something like one-quarter of a mile in length. The average grade of the ore at this depth on the McIntyre is upwards of \$15 per ton. The downward continuation of this main orebody has been cut at a depth of 1,380 ft., where a width of about 18 ft. of ore has been indicated to contain average values of well over \$20 per ton. The mine now occupies second place in point of production among all the gold mines of the Dominion.

Due to carrying on the enormous amount of construction and development work together with the high cost of labor and supplies, the Porcupine mines have discontinued the payment of dividends, that is, with the exception of McIntyre. The latter company has been able to carry out its development and expansion program and at the same time has disbursed interim dividends at the rate of 20 per cent. per annum.

The total production to date from the gold mines of Porcupine approximates 1,830,000 oz. or about 76 tons of gold bullion. The value of the output is estimated at upwards of \$37,000,000. Dividends amounting to more than \$11,000,000 have been paid. Taken together with the \$72,900,000 in dividends paid by the Cobalt mines the aggregate dividend disbursements have now reached approximately \$84,000,000. The total production from the gold and silver mines of Northern Ontario has reached the enormous sum of more than \$190,000,000.

Silver mining commenced in 1904, but it was not until 1910 that gold mining was gotten under way. As yet there appears to have been no boundaries established to the gold area, and at the producing mines values at depth have been found excellent. With these facts in mind, it is strongly indicated that this country is probably in line for one of the most marked periods of expansion ever experienced in the history of gold mining. With the cessation of war, and with a full realization of the result of operations of the past year or so in the gold camps there would appear to be excellent reasons for looking for a veritable shower of capital for the development of the numerous promising properties in the vicinity of the already proven mines.

The management and staff of the various producing mines throughout the district have exhibited a high degree of efficiency during the period of strain of the past two years and especially the past twelve months. Indeed the industry may now be said to be in the most competent hands it ever was. The first-class mining engineers have won the confidence of the directors and the shareholders alike of the companies which they represent.

The gold camps of Northern Ontario in their order of importance, are: Porcupine, Kirkland Lake, Munro, Boston Creek, Bourk's Siding, Larder Lake, and Kow-



kash. Among the promising prospective fields are: Lightning River, Seseikinika, Skead Township, Fort Matachewan, Thackeray, etc.

Thus, with scores of millions of dollars in ore reserves in the producing mines of the leading camps, and with scores of excellent prospects in the various promising newer fields, and with no boundaries to the auriferous zone having yet been established, the assertions of the leading mining men of the country who say "with the cessation of war the country will go mad with excitement over the demonstrated mineral wealth of Northern Ontario," would appear to be well founded.

#### ANOTHER PYRITES MINE.

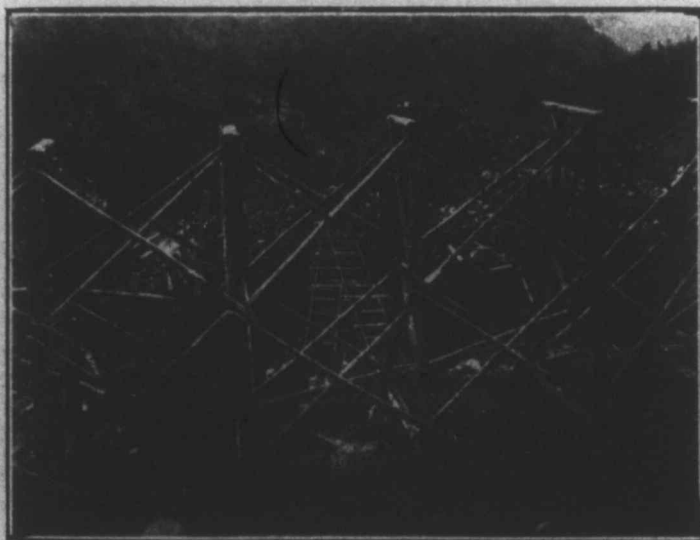
The great consumption of sulphuric acid has created an excellent market for pyrites. In New York the wholesale price is now about 20 cents per unit for domestic ore. The pyrites mines in Quebec and Ontario are not large in number but the total output has been considerable. A very large production is being made by the Madoc Mining Co., at Goudreau.

During the past summer a number of men have been employed in developing the pyrites property of the Rand Consolidated Mines Ltd., near Goudreau. Several shipments have recently been made from this new mine. The accompanying photographs illustrate conditions at the property.

Mr. A. W. Jackson says of the operations being carried on:

"Our principal energies are devoted to the getting out and shipping of a body of natural fines which we have uncovered. This ore is now being shipped as rapidly as railroad cars are being delivered to us. The exact extent of these fines is impossible to determine at the present time. Our present pit is about 40 by 100 ft. The fines here were covered with from five to six feet of limonite. The fines vary in depth from 3 feet to 8 and 9 feet and may possibly continue below this depth as we find the hard ore in a number of places is underlain by still further fines. The fines extend beyond this open pit in all directions.

"Back of the fines on higher ground we are open cutting in the solid ore. We have considerable of this ore broken down ready to run through crushers. The crusher foundations have been completed, and it will only be a very short time before the crushers are operating. We have at this property one No. 7½ Tel-Smith Gyratory and two No. 5 Tel-Smith Gyratory crushers. We are extending our private switch to



double its present capacity. Larger quarters are being erected for the accommodation of additional men so the force can be increased. Included in the general equipment we have a steam shovel, and a steam grader for stripping. The work is going on under the supervision of Mr. H. L. Botsford, mining engineer. Considerable additional equipment such as a dinky locomotive, heavier rails, etc., will probably be installed before spring."

#### NEW OFFICES, CANADIAN MINING INSTITUTE.

The Canadian Mining Institute has removed its offices in Montreal from the Ritz Carlton Hotel to the Drummond Bldg., 511 St. Catherine St. W.

#### ONTARIO-KIRKLAND GOLD MINES, LTD.

This company is about to begin operations at its property, the Hurd claims, at Kirkland Lake. Mr. Thos. J. Flynn is in charge of the work. Mr. B. G. Cobb, of New York, has been retained in an advisory capacity.

President Harry A. Cochrane says: "Our property comprises two full claims (formerly the Hurd), and our buildings are all up and furnished. The shaft is down 100 feet, and we are now into good millable ore. A 150-ft. section on our No. 1 vein, channelled every ten feet (15 samples), gives us an average assay value of \$9.55 per ton, and our other mineralized zones, after being systematically stripped, channeled and assayed for a fairly good distance, also show very satisfactory values."

#### TEMISKAMING.

In reference to the proposal to purchase an interest in the Kirkland Lake Co., Mr. Max Morgenstern has issued a circular letter which shows that he disapproves. He says in part: "The latest proposition has been communicated to you; I would consider it a new edition of a joke, if it did not possibly mean serious consequences to our Company.

"The large owners of shares in our Company are today, if anything even more strongly opposed to the present form of the deal, although the offer is 10 cents per share cheaper for a larger block of stock than the shareholders were offered last February. The reason for this fact is to be found in various extraordinary developments which have taken place since."



## NICKEL\*

By E. P. Mathewson.

In the middle ages the German miners were perhaps the most famous in the world. The mining of copper ore was one of their specialties. The miners were a superstitious people, believing in fairies, goblins and all manner of spirits. Two peculiar varieties of these were supposed to inhabit the mines, these were known as Kobalds and Nickels. The Kobalds were considered rather a lazy lot, but the Nickels were infamous thieves and were supposed to rob the ore of its copper. This was on account of the remarkable properties of certain ores that closely resembled copper ore, which on being treated in the copper furnaces, instead of yielding metallic copper, turned into a grey ash, from which no copper could be extracted, so the miners believed the Nickels had stolen the copper from this ore and they therefore named it kupfer nickel.

The Nickels got their name from St. Nicholas, the thieves' Patron Saint, and their actions in the mines and smelters were worthy of "Old Nick" himself. Many modern metallurgists who have encountered nickel in ores supposedly free from that element can readily sympathize with their predecessors in the art, on account of the difficulty of treating the ore in the ordinary manner.

In 1751 a Swedish chemist named Cronstadt discovered both nickel and cobalt to be metallic elements, and he named them after the "Spirits of the Mines." These two metals are closely allied to one another and to the metals iron and manganese. Nickel is a white metal almost as white as silver. It is hard and takes a fine polish, it is malleable and ductile.

Chemists have estimated that nickel is about twice as plentiful as copper in the earth's crust, but it is not found in concentrated form in many localities. A very high temperature is required to melt it, practically the same as iron.

In nature it is usually found combined with iron and sulphur, and frequently with iron, sulphur, copper and arsenic. It is an important constituent of meteorites.

In the mining of nickel ores, Norway held the palm until 1877, then New Caledonia took the lead and held it until 1890, then Canada stepped to the front and gained the premier position, which it has held ever since.

### Canada's Leading Position as a Producer of Nickel.

Up to the time that Canada became the most important producer of nickel, the world's output of refined nickel was comparatively small. It was estimated at a little over 500 tons in 1876, of which Norway was credited with 360 tons.

The world's output for 1916 is estimated at 49,000 tons nickel, of which

Canada produced . . . . .	85.8%	or	42,000 tons
New Caledonia . . . . .	9.2%	or	4,500 tons
Norway . . . . .	2.0%	or	1,000 tons
U. S. A. (by-products) . . . . .	2.0%	or	1,000 tons
All other countries . . . . .	1.0%	or	500 tons

100.0% or 49,000 tons

At the outbreak of the war, Great Britain and France controlled 95 per cent. of the nickel produced in the world and by placing embargo on shipments to Germany, 2 per cent. additional, Norway being

still an important shipper to Germany. On account of the necessities of our enemies, the prices offered for nickel were so great that the Norwegian producers were doing everything in their power to increase their output and had arranged to double it, when Great Britain stepped in and, by certain negotiations with the producing companies, practically stopped shipments to Germany.

### Report of Ontario Nickel Commission.

There was, as we all know, considerable agitation in Canada for the construction of nickel refinery plants in Ontario, which was augmented by the incident of the shipment of nickel from the United States to Germany in the submarine "Deutschland." On Sept. 9th, 1915, a Royal Commission of four experts was appointed to investigate the resources, industries and capacities of Ontario in connection with nickel and its ores. This Commission made a most searching inquiry into this matter and recently published a voluminous report on the subject, which is obtainable by application to Thomas W. Gibson, Secretary Royal Ontario Nickel Commission, Toronto, Ont.

The Commission arrived at the following conclusions:

"1. The nickel ore deposits of Ontario are much more extensive and offer better facilities for the production of nickel at a low cost than do those of any other country. Nickel-bearing ores occur in many parts of the world, but the great extent of the deposits in this Province, their richness and uniformity in metal contents, and the success of the industry points strongly to the conclusion that Ontario nickel has little to fear from competition.

"2. Any of the processes now in use for refining nickel could be successfully used in Ontario, and conditions and facilities are at least as good in this Province as in any other part of Canada.

"3. In view of the fact that practically no chemicals are required, that there is a much more complete saving of the precious metals, especially platinum and palladium, and that electric power is cheap and abundant, the most satisfactory method of refining in Ontario will be the electrolytic.

"4. The refining of nickel in Ontario will not only benefit the nickel industry, but will promote the welfare of existing branches of the chemical and metallurgical industries, and lead to the introduction of others.

"5. The methods employed at the Ontario plants of the two operating nickel companies are modern and efficient, although there are differences in both mining and smelting practice. It is the consistent policy of both companies to adopt all modern improvements in plant or treatment. Even during the present time of acute pressure, the Canadian Copper Co. has materially increased its output without substantial enlargement of its plant, and the losses in smelting are less, both at Copper Cliff and the Mond plant at Coniston, than they were a year ago. These companies have each had their experimental stage, neither has asked nor received any government assistance, and they have earned the success which they have achieved.

"6. The present system of mining taxation is just and equitable and in the public interest, and is the best system for this Province. Any question of change is rather one of rate than of principle.

"7. Experiments have been undertaken by the Commission in the production of nickel-copper-steel direct from Sudbury ores, and also in the electrolytic refining of nickel. Certain improvements in the latter

\*An address before the Royal Canadian Institute, Toronto, Nov. 23, 1917.



process have been made the subject of application on behalf of the Government of Ontario for patents in Canada, United States and Great Britain."

The Commission further states that, "the proven or positive ore of the Sudbury area can be conservatively put at 70 million tons, while it is safe to say that the proven, together with the probable and possible ore supply, exceeds 150 million tons. The International Nickel Co.'s published estimate of their ore reserves is 57 million tons, which is for three mines only. Although the Sudbury deposits have been worked for 29 years, there is vastly more ore proven in the district today than there was five years ago.

"No such vast deposits of workable ores, considered as a source of metallic nickel, are known in any other country, and there is no reason to believe that any competition will arise with which Ontario cannot cope."

#### Extraction of Nickel From Its Ores.

In extracting nickel from its ores, there are four important steps: (1) **Roasting** to drive off excess sulphur. This is done either in heaps, using cordwood for fuel, or in furnaces mechanically operated and fired by coal. (2) **Smelting** in blast or reverberatory furnaces, to form low grade matte, a mixture of nickel, copper, iron and sulphur, containing also the precious metals if such are present in the ore, and slag, which is a mixture of the earthy matter in the ore and is here discarded. (3) **Converting** or concentrating the matte by driving off more sulphur and removing the iron in the form of slag. This is performed in large cylindrical furnaces lined with magnesite brick and provided with a large number of small pipes or tuyeres penetrating the brick lining, through which air under pressure is forced, causing chemical action in the hot matte contained in the vessel, thus producing sufficient heat to keep the mass molten. The iron and sulphur are oxidized, and the iron combines with silicious material to form slag, which is poured out of the converter from time to time. The sulphur escapes up the chimney in the form of gas. (4) **Refining** in which the concentrated matte (containing approximately 80 per cent. copper and nickel) is purified by removal of the remaining sulphur and the separation of the nickel from the copper and precious metals.

Up to this point the processes in different establishments are practically identical, the one important exception being that in some plants the roasting operation is combined with the smelting and is performed in the blast furnace. There are three standard methods of refining such nickel ores as we find in Canada: (1) The Orford process; (2) the Mond process, and (3) the electrolytic or Hybinette process.

In the Orford process the copper-nickel matte is smelted with sodium sulphate and carbonaceous matter, producing a double sulphide of copper and sodium which separates as an upper layer above a matte much richer in nickel and poorer in copper. A repetition of this process eliminates the bulk of the copper and a matte is finally obtained that is so rich in nickel that, after being roasted and leached, it can be smelted in a reverberatory furnace for the production of metallic nickel.

The disadvantage of the Orford process is that there is but a small recovery of the precious metals and it is believed that the loss of copper and nickel is greater than in the other two processes.

In the Mond process the ores are roasted to remove the sulphur, and leached with sulphuric acid to remove the copper as copper sulphate, followed by the reduction of nickel oxide together with a small quantity of copper oxide by means of producer gas to a finely divided metallic state. Next the metal is treated in a vertical chamber at a certain temperature with producer gas, which converts the nickel into the volatile nickel carbonyl, which in turn is decomposed to metallic nickel in another tower at a still higher temperature.

The Hybinette process at present used at the Norwegian refinery referred to above is the one adopted by the British America Nickel Corporation near Sudbury. In this the granulated matte is roasted, then leached with sulphuric acid to extract the bulk of the copper, which is precipitated electrolytically in special tanks. The matte residue is melted into plates and put through a special electrolytic process whereby the nickel is separated in purified form. The precious metals are recovered from the electrolytic slime which is deposited in the bottom of the tanks.

#### Uses of Nickel.

The greatest use of nickel is in an alloy of steel. Bradley Stoughton in "The Metallurgy of Iron and Steel" says: "In the ordinary commercial alloys the nickel ranges from 1.50 to 4.50 per cent. and usually from 2.00 to 3.75 per cent., while the carbon varies from 0.20 to 0.50 per cent. If we omit armour plate, which, besides nickel, contains chromium, the most important uses of nickel steel are for structural work in bridges, railroad rails, especially on curves, steel castings, ordnance, engine forgings, shafting, especially marine shafting, frame and engine parts for automobiles, wire cables, axles, especially automobiles, railway cars, etc."

The reason for these specific uses of nickel steel are the wonderful properties conferred by the addition of such small amounts of nickel.

In bridge construction the use of nickel steel saves from 10 to 30 per cent. in weight, and up to 12 per cent. in cost. The Quebec bridge is an example of the use of this alloy.

Nickel steel and white metals (i.e. non-ferrous alloys containing nickel) probably now during war times use up 90 per cent. of the total world production of this metal.

Nickel is not easily corroded—salt or fresh water do not affect it, and on this account the metal is useful for cooking utensils.

Monel metal is an alloy of nickel and copper made by the International Nickel Co. by smelting ores from the Sudbury district without separating the copper from the nickel. The composition is approximately 67 per cent. nickel, 28 per cent. copper, and 5 per cent. iron and cobalt. It has a tensile strength equal to good nickel steel, is not easily corroded, is of the same color and takes a polish equal to that of nickel. It is used for propellers for warships and smaller craft, including racing motor boats; for valves on high pressure steam lines; valve stems; pump rods and liners; acid pumps; burning points in enamelling and japanning ovens, pickle frames and rods in tin plate mills; wire cloth; golf club heads and roofing materials.

There are many alloys of copper with zinc and nickel in varying proportions, which are known as German silver (average composition about 50 to 60 per cent. copper, 20 to 30 per cent. zinc, and 15 to 25 per cent. nickel).



Nichrome is an alloy of nickel and chromium used largely for resistance wires in electrical work. It stands temperatures above red heat without melting and with little oxidation. Considerable quantities of nickel are used for plating iron and other metals where a beautiful protective finish is desired.

Nickel alloyed with copper is used for coinage.

From what has been said, the importance of the nickel industry to Canada cannot be overestimated. Up to the present time, no nickel has been refined in Canada excepting a small amount obtained as a by-product in the treatment of Cobalt ores.

The International Nickel Co. has under construction a large refinery at Port Colborne, Ont., which will be in operation in 1918.

The British America Nickel Corporation is also constructing a refinery plant in Ontario, which will be in operation in 1919.

The Mond Nickel Co. has its refinery in Clydach, Wales.

By the end of 1919, Canada will be one of the greatest refiners of nickel, as well as the greatest producer of ore and matte.

#### MOND NICKEL COMPANY EMPLOYEES SUBSCRIBED LIBERALLY FOR VICTORY BONDS.

When in March last the Mond Nickel Company offered to buy bonds of the 1937 War Loan for their employees, allowing them two years to make repayment, they took advantage of the offer to the extent of \$114,500.

When the Victory Loan was announced, the company offered to purchase these bonds on a repayment plan of twenty-five months at the rate of \$4 per month for each \$100 bond, the interest on the bonds to be paid to the men every six months as it becomes due.

It was felt that, as only one-third of their indebtedness on the previous loan had been repaid, employees would hesitate before incurring further obligations, but the splendid patriotism they have always displayed was again shown by the following totals rolled up for the Victory Loan at the various plants:

Coniston .....	\$169,300
Garson .....	26,300
Worthington .....	25,250
Levack .....	24,400
Mond .....	21,000
Bruce .....	7,850
Wabageshik and Nairn Falls.....	4,000
Canadian Explosives .....	25,000
	<hr/>
	\$303,100

The Coniston figures contain \$50,000 transferred from the old loan. This, with the \$25,000 transferred by the Canadian Explosives, Limited, when deducted from the above total shows the actual cash invested in the Victory Loan to be \$228,100. When we add to this the \$114,500 invested in the issue of March last, we have the magnificent total of \$342,600 subscribed for by employees of the company within the year.

#### SUDBURY DISTRICT DID WELL.

Sudbury, Ont., Dec. 6.—Every home in the Sudbury District has not a Victory Bond, but the recapitulation of Sudbury's wonderful record of the past three weeks in subscribing \$1,541,750 to the Victory Loan is equivalent to one subscriber to 5.35 of the population of the District.

#### BRITISH COLUMBIA MINERAL PRODUCTION IN 1917.

British Columbia's mineral production for the first ten months of 1917 is within 5 per cent. of the mark set at this time last year, according to an announcement by Hon. William Sloan, Minister of Mines. But for labor troubles in the Crow's Nest early in the season and at Trail at the present time, 1917 would show a figure considerably in excess of the banner total of last year, when the mineral production of the province reached a value of \$42,290,462.

"I am highly gratified at the mineral production of the province this year," said Hon. Mr. Sloan, "in view of the labor situation which was experienced in Fernie and elsewhere. Month by month, last year was not more than 5 per cent. better than 1917. The Fernie labor difficulties not only meant the closing down of the coal mines there but it also had a serious effect on the smelters and consequently the mines. But for that we would have beaten our high-water mark of 1916. The recent strike at Trail will also have the effect of keeping us back for the remainder of the year unless government efforts to have an amicable arrangement reached at once are successful."

It is understood that a proposal has been made to have the Trail smelter-men go back to work pending investigation of their claims for an eight-hour day. Every effort is being made to reach a satisfactory conclusion acceptable to the men, who seek shorter working hours such as enjoyed at Grand Forks and Greenwood, and the company which is relying upon an un-terminated agreement.

Should the Trail difficulties be settled at once so that smelter production can be resumed there, it is believed that the 1917 mineral production of British Columbia will be practically forty millions.

#### NORTHERN ONTARIO BUYS VICTORY BONDS.

The Temiskaming district, which includes the Cobalt and Porcupine mining centres, made a splendid contribution to the success of the Victory Loan. The number of persons subscribing was exceptionally large.

Cobalt and Porcupine mining companies subscribed as follows:

Hollinger .....	\$500,000
McKinley-Darragh .....	50,000
Kerr Lake .....	250,000
Nipissing .....	500,000
Mining Corporation .....	500,000
Temiskaming .....	200,000
Dome Mines .....	50,000
Coniagas .....	50,000
McIntyre .....	100,000

The objective for the district was \$468,000. Three times this amount was subscribed in small sums. In addition to this Cobalt and Porcupine mining companies subscribed about \$2,200,000. Of the residents in the district one in five bought Victory Bonds. Cochrane holds the record with an average of one purchaser for every 2.6 people.

#### JUALIN ALASKA MINES.

Work at the Jualin Alaska Mines, Jualin, Alaska, has been suspended pending readjustments and preparations to start on a much larger scale. Work will be resumed before Spring. It is intended to increase the present 10 stamp mill by the addition of a pebble mill bringing the capacity up to 150 tons per day.



### A Successful Year for Cobalt Silver Mining Co's.

The year 1917 has been the most profitable during half a decade for the silver-mining companies of Cobalt. The monthly yield of silver has averaged about 1,650,000 oz. When the year closes an aggregate output of around 20,000,000 oz. will have been recorded and the value of the product will approximate upwards of \$16,000,000.

The grand total of the output since 1904 is now in the neighborhood of 274,000,000 oz. and the net value of the product is about \$154,000,000. The best year in point of value was that of 1912 when the yield was valued at \$17,408,935. With the exception of the banner years 1912 and 1913, the value of the 1917 yield will probably be the best in the history of the camp.

The average price of silver during the year will be a fraction over 80 cents per oz. as compared with 65.66 during 1916 and 49.68 in 1915. The highest quotation for the year was \$1.08 per oz. and constitutes the highest price during the past half century.

The Mining Corporation has maintained an output of around 425,690 oz. of silver per month or at the rate of approximately 5,108,280 oz. per year. The value of the production from this mine aggregates about \$4,086,624 for the year and lends to the mine the distinction of being the greatest silver producer under the British flag. The total production from the Mining Corporation property during the past ten years approximates 28,118,674 oz.

The Nipissing mine during the year has occupied second place to the Mining Corporation. However, since the beginning of operations, the Nipissing has yielded about 48,800,000 oz., thus leading all other mines in the country. The Nipissing has been the greatest dividend payer and has distributed a total of \$17,140,000 among its shareholders, \$1,800,000 of which was paid during the current year.

The silver mining companies which have produced over one million oz. during 1917 are: Mining Corporation, Nipissing, Kerr Lake, Coniagas, O'Brien, McKinley-Darragh, Miller Lake O'Brien. The latter named property is in the Gowganda field, and only within the past fifteen months has come into prominence. The property, like the O'Brien mine at Cobalt, has been privately owned by M. J. O'Brien up until very recently, when a new company known as the M. J. O'Brien, Limited, was formed and under whose control both mines have passed.

A disappointing feature of mining operations here during the past twelve months is the result of the exploration at the 1,6000 ft. level, below the diabase sill, at the Temiskaming mine. A responsible engineer has intimated that further expenditure in that zone is not warranted by present indications. On the other hand in the majority of the producing mines, as work has advanced, ore has gradually been proven to exist far beyond previously known limits, and it would appear as though in the aggregate the leading companies will begin 1918 with ore reserves quite on a par with that with which the current year was begun. This is after a production during the past twelve months of over \$16,000,000. Indeed a number of these now famous old mines seem to have gotten into the habit of maintaining ore reserves from two to four years ahead of

current production, which fact tends to afford reasons for the unshaken confidence of their operators.

By reason of their abnormal prosperity, not a few of the leading companies have been carrying on systematic investigations of various prospects further north. The Gowganda silver area has come in for considerable attention, and so has the gold district from Boston Creek all the way north to the Transcontinental railway and west as far as Tashota in the Kowkash area. The areas examined included Boston Creek, Skead Township, Larder Lake, Kirkland Lake, Bourke's Siding, Thackeray Township, Munro, Rickard, Lightning River, Porcupine, Tashota and other fields. As a result nearly every Cobalt company now finds itself interested in one or more gold properties of more or less promise. Perhaps the most fortunate in this respect as so far determined is the Beaver Consolidated, the Buffalo Mines, and the Coniagas. The Beaver only within the past month completed the purchase of the property of the Kirkland Lake Gold Mines at Kirkland Lake, on which perhaps upwards of three-quarters of a million dollars in ore has already been proven to exist. The Teck-Hughes is controlled by the Buffalo Mines interests and ranks as second among the Kirkland Lake mines. The Coniagas has acquired control of the Ankerite and the Maidens-McDonald property in Porcupine, a property which appears to be on a fair way toward becoming a profit yielder. The Mining Corporation of Canada has taken options on several properties both in the Gowganda silver area and the gold district, and also in the Cobalt area. Among the properties optioned in the Anderson claims in Rickard township a few miles north-east from Mathe-son, and the Hyland claims in Gowganda. They have also purchased the Alexander property in Cobalt, as well as operating the Waldman. The Kerr Lake have the Mondeau claims at Boston Creek under option and are installing a small mining plant. The Crown Reserve, together with the Dominion Reduction Company has acquired the Newray property of Porcupine on a working option.

In addition to having gone far afield in securing mining properties, all the leading companies have been heavy subscribers to the recent Victory Loan, three of the companies taking \$500,000 each. Despite heavy subscriptions, taxes, and the expense attendant upon exploring and paying for new properties, together with the high cost of labor and supplies, the Cobalt companies have during 1917 disbursed an aggregate of \$5,581,703.85 in dividends. This record compares with \$4,958,650.84 for 1916, or a gain of \$623,053. With the high quotations for silver continuing and the complete harmony between the mine operators and their employees, and with huge ore reserves on hand to begin with, the coming year would appear to have an excellent chance of being even more prosperous than that just drawing to a close.

The price of silver for the calendar year is about to establish a record of a fraction over 80 cents per oz., being nearly 25 per cent. higher than the average for 1916. The following summary shows the average price of silver since the beginning of mining in Cobalt, together with a summary of the number of ounces produced and the total value of the product. It will be noted that with the price of silver during 1917 having averaged over 80 cents per oz. the value of the product is second only to that of 1912 and 1913, and greatly exceeding that of the past four years.



**Silver Production of Cobalt District.**

Year	Price per Oz.	Oz. Produced.	Value of Production.
1904 . . . .	57.221	206,875	\$11,887
1905 . . . .	60.352	2,451,356	1,360,503
1906 . . . .	66.791	5,401,766	3,667,551
1907 . . . .	65.327	10,023,311	6,155,391
1908 . . . .	52.864	19,437,875	9,133,378
1909 . . . .	51.503	25,897,825	12,461,576
1910 . . . .	53.486	30,645,181	15,478,047
1911 . . . .	53.304	31,507,791	15,953,847
1912 . . . .	60.835	30,243,859	17,408,935
1913 . . . .	59.791	29,681,975	16,553,981
1914 . . . .	54.811	25,162,841	12,765,461
1915 . . . .	49.684	23,730,839	11,742,463
1916 . . . .	65.661	19,874,940	12,622,849
1917 (ind.)	80.224	19,600,000	16,000,000

**GROCH CENTRIFUGAL SYSTEM OF FLOTATION.**

Five years ago flotation was practically unknown on the American Continent and the rapidity with which it has advanced may be gauged from the fact that today it is responsible for the treatment of more than 30 000 000 tons of ore annually in the United States alone. It owes its popularity to its increased efficiency over other methods and to the fact that it can be installed and operated in appliances of the simplest and most inexpensive kind.

The greatest field for operation lies in the recovery of copper from sulphide, for which flotation is eminently suited, but its application has now become so extended as to include the treatment of ores containing gold, silver, lead, zinc and practically every other well known metal. The most easily floated minerals are those of a flaky character with a bright lustre or greasy surface. Graphite and molybdenite can be cited as extremely favorable examples. Every other mineral, however, has certain natural floatative properties, the degree of which determines the ease or difficulty with which it can be recovered by the flotation process. The conditions necessary for successful flotation are that the mineral be crushed to a fineness ascertainable only by experiment and that it be brought into intimate contact with a plentiful supply of minute air or other bubbles in a solution containing an oily, greasy or soapy substance, which on agitation will develop a froth.

The juvenile experiment of blowing soap bubbles illustrates the main principle underlying flotation, while that of dropping two or three grapes in a glass of effervescent "soda" gives an impressive demonstration of how those bubbles collect on the floatative substances, and buoy them to the surface. The solution is permeated with minute bubbles and these collect on the surfaces of the grapes and adhere until a degree of buoyancy is reached to effect their flotation.

By the Groch Centrifugal System of flotation, the crushed ore in the form of a pulp is aerated and oiled by means of centrifugal impellers, each of which consists of a hollow vertical shaft, and a centrifugal runner. The runner is so divided that during operation its upper part draws down air through the hollow shaft while its lower part sucks up the pulp through its hollow hub and ejects it violently at the periphery. By this action a vacuum is created all round the zone of discharge, air in large volumes is drawn into the impeller, atomized and forcibly discharged into the pulp as a shower of infinitesimally

small bubbles. These, because of their minuteness and of the pressure to which they are subjected, tend to become absorbed in the pulp and to re-form in a nascent state round each valuable floatative mineral particle as a nucleus. Oil, drop by drop, enters through the same hollow shaft and is ejected into the pulp as a fine spray. This action is repeated with each impeller of the machine so that with the standard six-impeller machine the valuable mineral particles are subjected to six separate flotation attacks during the period that the pulp is under treatment and the extraction is necessarily very effective.

For purposes of experiment a glass-fronted model is manufactured which in itself is a complete flotation unit, ready to run. In this model installation every detail of the process of aerating, oiling, collecting and separating the valuable mineral from the ore being tested is in full view of the observer.

Flotation is making such rapid progress that a machine of some capacity must now, almost of necessity, find a place in the equipment of every organization connected with the testing of ores, development of mining properties or recovery of industrial minerals.

**PERSONAL.**

Mr. J. B. Tyrrell has been nominated for the presidency of the Canadian Mining Institute.

Mr. Hugh Marriott is to succeed Mr. Edgar Taylor as president of the Institution of Mining and Metallurgy, London.

Mr. W. E. Segsworth, Administrator of Vocational Training, has returned from a visit to the Western Provinces. He is now in Ottawa.

Mr. John Stirling, Inspector of Mines of Alberta, was in Toronto last week.

President A. A. Cole of Cobalt, Mr. D. B. Dowling of Ottawa and Mr. Mortimer-Lamb of Montreal were in Toronto last week for a meeting of the Council of the Canadian Mining Institute.

District newspapers in British Columbia have announced that Mr. F. S. Norcross, Jun., of Copper Mountain, Similkameen, superintendent of mines for the Canada Copper Corporation, recently passed examination to rank as Captain in the United States Engineering Corps, and that he expects to be included in an early draft for service in France.

**MOLYBDENITE MINING IN QUEBEC.**

The molybdenite industry in Quebec is progressing, and it is not unlikely that this province will show a world's record of its production for 1917. The results of the diamond drilling at the Moss mine, at Quyon, operated by the Dominion Molybdenite Company, are said to have been very satisfactory, and it is claimed that a very large tonnage of ore has been blocked out. The concentrating mill has been completed, and is treating 200 tons of ore a day. Practically all the molybdenite produced is converted into ferro-molybdenum in Ontario furnace works. The Wood Molybdenite Company is proceeding with the development of the Squaw Lake property, and with the construction of its concentrator. The mill will be ready to start late in December or early in January. It is a small plant, intended to treat 20 tons a day, and only the rich ore will be put through at first.



# Ontario's Mineral Wealth

The rapid growth of Ontario's mineral industry may be gleaned from the following figures. The drop in 1914 is attributable to the outbreak of war in that year.

Year.	Value.	Year.	Value.
1893 .....	\$ 6,120,753	1914 .....	46,295,959
1903 .....	12,870,593	1915 .....	54,245,679
1913 .....	53,232,311	1916 .....	65,303,822

**ONTARIO IS CANADA'S PREMIER MINERAL PROVINCE, the 1916 production being 45 per cent. of the total output from Canada.**

*Nickel:* Sudbury produces 80 per cent. of the nickel of the world, and in 1916 the nickel-copper matte output contained 41,299 tons of nickel valued at \$20,649,279, and 22,430 tons of copper worth \$8,332,153.

*Silver:* Chiefly from Cobalt and outlying camps, 20,007,367 ounces of silver, worth \$12,703,591, were produced in 1916. The total silver production from the Cobalt camp up to the end of 1916 was 255,322,297 ounces, valued at \$135,829,548.

*Gold:* For 1916 the gold output was 497,833 ounces, valued at \$10,339,259. From the Porcupine Camp, the total production to the end of 1916 was \$28,200,322. Ore reserves of the producing mines at Porcupine are estimated at \$50,000,000. The Kirkland Lake camp comes next in importance.

**DIVIDENDS PAID TO JUNE 30th, 1917, EXCEEDED \$70,000,000 FROM THE COBALT SILVER CAMP, AND \$10,000,000 FROM THE PORCUPINE GOLD CAMP.**

The total valuation of the chief metals produced in Ontario up to the end of 1916 is as follows:

Silver .....	\$151,428,500	Gold .....	\$33,663,648
Nickel .....	89,128,164	Copper .....	33,452,628
Pig Iron .....	76,544,482	Cobalt .....	3,180,990



# Silver Ore from Cobalt, Ontario

The silver deposits discovered at Cobalt, Temiskaming district, Ontario, in 1903, have proven to be wonderfully rich. The district has now produced about 275,000,000 oz. silver for which the companies received about \$152,000,000. Of this amount the companies have distributed in dividends over \$70,000,000

The beautiful pink color of the weathered specimen is due to cobalt bloom or erythrite, which is formed by the weathering of smaltite and smaltite-chloanthite. The latter minerals are characteristic of the silver deposits of the Cobalt district and hence cobalt bloom is characteristic of surface outcrops of the deposits.



A Weathered Specimen of Cobalt Ore

or just about one-half. The large profit made is not surprising when it is known that much of the ore mined is as rich as the specimens shown here.

The illustrations are of typical high grade ore. On this page is shown a weathered specimen. On the opposite page is reproduced a piece of unaltered ore that has been cut and polished.

The green colored area is nickel bloom which results from the alteration of niccolite. Niccolite occurs with smaltite in most of the silver deposits, but the weathered product is not so striking as cobalt bloom and the prospectors soon learned to look for pink stains. A peculiar feature of the nickel bloom is that the presence of a small percentage of the cobalt bloom

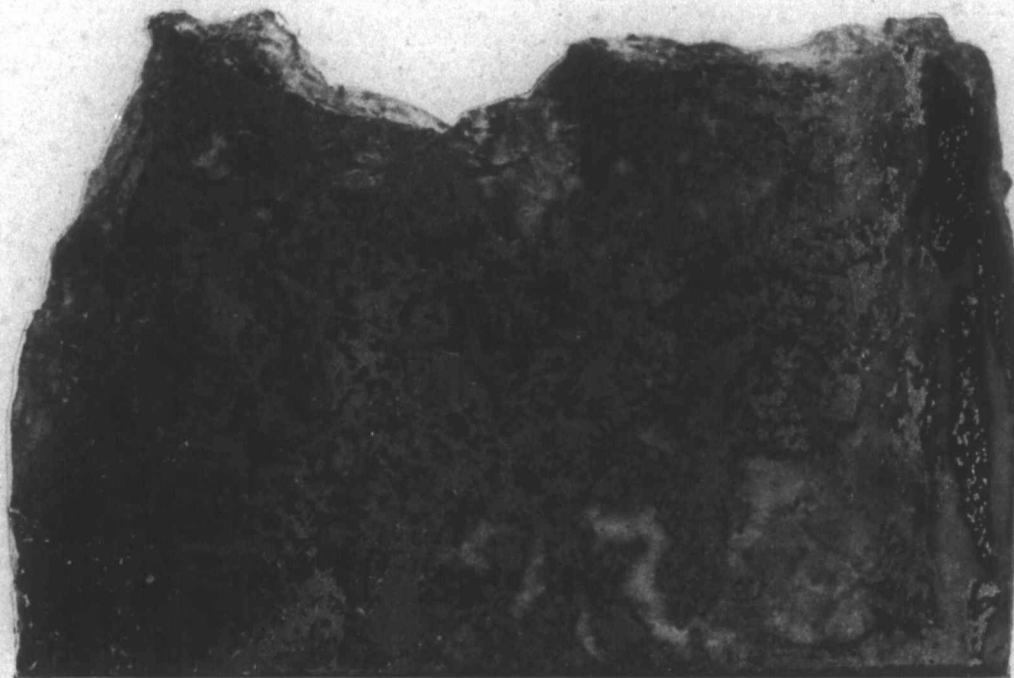


neutralizes its color and the mixture is a dull white substance that does not attract the eye.

One of the commonest gangue minerals in the Cobalt silver deposits is calcite; but there is probably more dolomite than calcite. Quartz is not an important constituent of the veins, though there is much

Some occur in the older Keewatin rocks. All occur near the diabase, above or below the contact or its probable extension.

As the Cobalt mines were developed a larger and larger percentage of low grade ore was broken. Excellent progress has been made by Cobalt metallur-



A Polished Specimen of Cobalt Ore

of it in the wall rocks and consequently in the milling ore.

Such ore as is here illustrated occurs in thin veins, commonly but a few inches thick. Most of these veins stand vertical, or nearly so, in flat lying sedimentary rocks of the Cobalt series (Huronian). Others occur in a sill of diabase that intrudes the Cobalt series.

gists in treating this low grade material and a large quantity of ore assaying around 20 oz. silver per ton is being profitably treated. There still remains however much high grade ore. The Nipissing company alone had on Jan. 1, 1917, a reserve of 3,673 tons which averaged 1,370 oz. per ton, in addition to 163,721 tons of milling ore averaging 25.2 oz.





PROVINCE OF ONTARIO



BUREAU OF MINES

## GEOLOGICAL SKETCH MAP OF ONTARIO



The area of Ontario is 407,262 square miles, 70 per cent. being pre-Cambrian, which is pre-eminently the metal-bearing formation of the Province.

Ontario's mineral resources cover practically the entire list of metallics and non-metallics with the exception of tin and coal.

The producing camps are readily accessible by railway, the climate is invigorating and healthful, water power is near at hand, and other conditions are favorable for mining.

FOR GEOLOGICAL MAPS, ILLUSTRATED REPORTS, MINING LAWS, AND LIST OF PUBLICATIONS, APPLY TO

**ONTARIO BUREAU OF MINES**

PARLIAMENT BUILDINGS

TORONTO, CAN.



## SPECIAL CORRESPONDENCE

### NORTHERN ONTARIO.

#### Burnside Property Will Be Developed.

The deal has been closed whereby the Burnside property at Kirkland Lake comes under control of the Aladdin-Cobalt mining company. The Burnside is looked upon as one of the most important idle properties in the Kirkland Lake camp, and lies adjacent to the Tough-Oakes mine. From the geological conditions and the number of veins containing commercial ore already opened up on the Burnside, it would appear that the prospects for the property eventually becoming a valuable asset to the Aladdin-Cobalt are very good. The Aladdin-Cobalt company also owns control of the Chambers-Ferland mine at Cobalt, and through the development of the latter property is in a strong financial position to carry on the work on the new property. Development of the Burnside is to begin at once.

#### Will Help Soldiers to Hold Claims.

Mr. T. E. Godson, mining commissioner, has requested the Hon. Mr. Ferguson to have an order-in-Council passed, carrying the license of the prospector serving in Canada's army, and making unnecessary the performance of work on mining claims staked on his license until a specified time after the soldier's discharge. It is understood this order will be passed at once.

#### Teck-Hughes Plant Will be Doubled.

The directors of the Teck-Hughes visited the property recently and decided on increasing the present plant to double its capacity or bringing its treatment of 160 tons of ore per day into effect at the mine. The underground developments at the property during the past few months have been of a highly encouraging nature, and the ore reserve has been added to extensively. At the present time a winze is being sunk from the 600 to the 800-ft. level, where a crosscut will be run to a point directly under the main shaft and a raise put up to connect the latter with the lowest working of the mine. It is expected that the increased milling facilities will be available for the treatment of ore early in the coming spring.

#### Plant Installed at Whelpdale.

A small plant has been installed on the Whelpdale property at Porcupine and is now in operation. Underground development will be proceeded with at once. This property is situated a little north-west from the west end of Gillies Lake and comprises 160 acres.

#### Changes at Tough-Oakes.

Mr. D. H. Angus, of the Right-of-Way mines, has taken over the management of the Tough-Oakes mine at Kirkland Lake, succeeding Mr. Chas. O'Connell, who has held this position for a number of years and who, with Mr. Murphy, captain at the Tough-Oakes, will direct his attention to the operation of the Patricia-Syndicate property at Boston Creek, in which Mr. O'Connell is interested.

#### Kerr Lake Company Developing Claims in McElroy Township.

The Mondeau claims in the township of McElroy (a portion of the Boston Creek district) have been taken under option by the Kerr Lake Mining Company of Cobalt, and development of the claims has already commenced. A road has been built to the property and a small mining plant will be installed as soon as pos-

sible. However, sinking will be proceeded with by hand steel until such time as the steam plant has arrived and been erected. These claims were under option to the Buffalo Mining Company of Cobalt last spring, the latter, however, were developing the properties as a bismuth proposition and evidently the results encountered were not found satisfactory. Good gold values occur in a four-foot vein on the property, and now that the Kerr Lake interests have taken an option, the merits of the property will be made known. Encouraging gold values have been encountered on a number of other properties in the vicinity of the Mondeau claims, but the nearest property on which extensive development work has been done is the Boston Gold Leaf, which is on the line of Boston and McElroy townships. Results obtained on the Boston Gold Leaf were fairly satisfactory.

#### Kirkland Lake Production Will Be Large.

With the completion of the mills at present under construction in the Kirkland Lake camp, the milling facilities for the district will aggregate 530 tons of ore per day. The average gold content of the ore so far encountered in the camp should make possible a gross yield of approximately \$200,000 per month, or close to two and a half million dollars annually. The outlook for materially increasing this production during the following two years to more than double that of the present seems exceptionally bright.

#### Opening Up Lightning River District.

A winter trail is being cut from Kirkland Lake to the scene of the recent gold discoveries in the Lightning River District, which is between 30 and 35 miles distant. The trek to this district is increasing and already upwards of a hundred claims have been staked. Development work has commenced on the discovery claims and if this proves satisfactory, the coming summer should see considerable activity in this district.

#### Murray-Mogridge.

The shaft at the Murray-Mogridge property at Wolfe Lake has reached a depth of 200 ft. and is being sunk to the 300-ft. level. A station has been cut at the 100 and 200-ft. levels and drifting in both directions on the vein is progressing with satisfactory results. At the present time the vein is the full width of the shaft and the values are said to be double those encountered on the surface. During the present summer a vein now designated as No. 6 was located about 300 ft. west of the No. 1, and has since been stripped for a distance of 90 ft., and has an average width of five ft. The average values encountered on the No. 1 vein are said to be close to \$12, while those encountered on the No. 2 vein are said to have given an average of \$13 per ton. Developments at this property to date have proven very satisfactory.

#### Installing Milling Machinery at Lake Shore.

The mill building at the Lake Shore mine at Kirkland Lake has been completed and the installation of machinery is now in full swing. It is anticipated that this will be completed in January and the production of bullion should commence early in the new year. From the days of its staking to the present time this property has been in the hands of Mr. Harry Oakes, the pioneer of the Kirkland Lake camp. Largely through his efforts the mine has been nursed through its various stages until now it is on the threshold of becoming a producer.

#### Kirkland Lake Gold Will Erect Mill.

The final payment for the property of the Kirkland Lake Gold Mines was made by the Beaver Consolidated



of Cobalt on the 23rd of November. The purchase price of the property was \$300,000 spread over four payments of \$75,000 each. Upon the payment of each instalment a certain amount of the stock of the company was handed over to the purchasers. It is about two years since the property was first taken under option and development work since that time has been carried to a depth of 700 ft., with highly satisfactory results, and upwards of eight thousand tons of ore has been placed on the dumps. The total ore reserves are understood at the present time to aggregate not far short of a million dollars. The preliminary work of erecting a mill of 150 tons capacity is now under way.

#### **Bourke's Mines.**

The work of erecting an up-to-date set of camp buildings is now under way at the Bourke's Mines (formerly known as the Anderson Farm at Bourke's Siding). An extensive exploration plan has been outlined and developments will be watched with more than usual interest, owing to the fact that surface showings were exceptionally rich.

#### **Miller-Independence Using Groch Flotation Process.**

The first gold mine in Northern Ontario and perhaps in the Dominion of Canada to commence the treatment of ore by the oil flotation process is the Miller-Independence at Boston Creek. After a two-months' run the total extraction is said to average about 94 per cent. The milling equipment consists of a Blake rock crusher, a 4 ft. x 5 ft. ball mill, drag classifier, two amalgamating plates, mercury trap, cones and a Groch flotation machine. The grade of ore being treated is around \$8 per ton and the capacity of the mill is about thirty-five tons per day. About 30 per cent. of the gold is recovered on the amalgamating plates, 30 per cent. in the mercury traps and the balance in the flotation concentrates, which assay about \$200 to the ton.

#### **Lightning River District.**

It is reported here that the Lake Shore Mining Co. of Kirkland Lake have acquired an option on a group of claims lying next to the original discovery in the Lightning River district, on which a sensational discovery of gold has been made.

#### **Leading Gowganda Mine Is Now a Big Producer.**

The Miller-Lake-O'Brien mine at Gowganda is now yielding upwards of 84,000 ounces of silver per month, and at the present time this mine holds seventh place among the silver producers of the Dominion. This record is all the more remarkable when it is remembered that just a little over a year ago only sufficient ore was in sight to about pay the expenses of operation. Much of the ore coming from the lower workings of this property carries values of 5,000 to 10,000 ounces to the ton and sometimes the ore is found so rich that it is hard to reduce it to a size convenient to handle. Owing to the fact that the company is a close corporation, very little information has been given to the public, with the result that all estimates as to the probable ore reserves of the mine are more or less guesswork. However, the fact that the 1917 production will approximate nearly 1,000,000 ounces, leads to the natural conclusion that the ore reserves are very large. It is not surprising that the Cobalt mining companies are evincing more than usual interest in the promising prospects in this district.

#### **Prospecting at Tashota.**

Prospects on the Nelson-Hull and Kipper claims in the Tashota section of the Kowkash gold area are said

to be exceedingly bright. A body of ore one hundred feet in width and said to be carrying encouraging values has been uncovered. The surface assays are said to have proved ore of a commercial value, and it is understood efforts are being made to get the proposition in line for exploration at depth.

#### **Patricia Syndicate Is Developing Its Boston Creek Property.**

A force of about thirty men is employed at the Patricia Syndicate property, in the Boston Creek district and the shaft is being driven at the rate of about three feet every twenty-four hours. The surface showings on this property are among the most sensational in the North Country. The first vein discovered was not wide, but was exceedingly rich. However, a wider vein was uncovered some distance south and paralleling the original discovery. This latter vein also carries spectacular showings of visible gold, and the property has now found its way into strong hands. Mr. Charles O'Connell, formerly manager at the Tough-Oakes at Kirkland Lake, is now in charge of operations, and it is understood the plan of development includes the sinking of two shafts to a depth of 200 feet, from which level lateral work will be undertaken. When completed this should go far towards proving the stability of the ore bodies of the camp.

#### **Shaft Sinking and Diamond Drilling Rickard Property.**

A shaft is being sunk on the main vein of the Rickard Township property, recently taken under option by the Mining Corporation of Canada. Preparations are also under way to diamond drill the property at the earliest possible date, in an endeavor to prove more fully the merits of the claims with the least possible delay.

#### **United-Kirkland.**

Developments at the United-Kirkland property are understood to be encouraging. The shaft has been sunk to a depth of about 100 feet, during the course of which three veins were encountered. The first vein on which the shaft was started left the working a few feet below the surface, the shaft being sunk perpendicularly, while the veins have a dip to the south, similar to that of nearly all other veins in the Kirkland Camp. A few feet further down in the working a second vein was encountered and at a depth of 45 feet a third one entered the working and disappeared again about the 65-foot depth. At the 100-foot level, where a crosscut will be run in an endeavor to tap the three veins met with in sinking the shaft. A small steam plant supplies the power for the mine and three shifts are being worked. About fifteen men are employed.

#### **Drilling Hayden Property.**

The diamond drill hole at the Hayden mine in Porcupine is down a depth of about 700 feet. It is intended to drill the property to a depth of 1,000 feet. The core-splitter (more or less of an innovation in the Porcupine camp) is giving good results. The general exploration work at the Hayden is proving very promising.

#### **Porcupine V. N. T.**

A policy of aggressive development of their property was decided on at a meeting of the directors of the Porcupine V. N. T., held in New York recently. The plan to be followed will be the extension of the workings at the 600-foot level, and also the sinking of the



main shaft to a depth of 800 feet. This latter decision should prove gratifying to the shareholders, owing to the fact that excellent results have been encountered on neighboring properties at greater depth. It was also decided that all the ore for the 100-ton mill will hereafter be taken from the underground workings, instead of a portion of it coming from the big dump on the surface. Upwards of sixty men are employed on the property and the mine is in excellent physical condition.

An agreement has been reached whereby the Thompson-Krist property will be worked from the 400-foot level of the Porcupine V. N. T. working. A crosscut is to be driven at this level on to the Thompson-Krist, where the rock formations are known to be favorable to ore depositions, and the prospects of finding commercial ore are believed to be good.

#### McIntyre's Good Showing.

For the first nine months of the present year the McIntyre-Porcupine mines yielded an average of \$132,842 per month. However, during recent months this average has approximated about \$140,000 per month, or at the rate of \$1,680,000 per annum. With the grade of ore at this mine ranging around \$11 to the ton and the costs of mining running close to half this amount, it will be seen that after producing the amount required for the payment of the quarterly interim dividend of 5 per cent., the company would still be able to lay aside a considerable surplus. The dividend requirements call for \$744,000 per year and the amount being produced under the present unfavorable conditions runs close to \$840,000 in net profit. Under more favorable economic conditions it is quite evident McIntyre could do much better.

#### Important Discoveries at Hollinger Mine.

Recent developments on the Hollinger-Consolidated property at the 400-foot level of the Miller-Middleton section are exceedingly good. This latest development has shown an orebody which is 71 feet in width and carries average values of \$28.60 per ton. This is perhaps the largest body of high-grade gold ore ever encountered in America, and coming on top of the recent developments in other portions of this mine appears to verify the assertion that the Hollinger is perhaps the greatest gold mine in the world. During the year 1916 the mine was equipped with milling equipment sufficient to handle about 1,800 tons of ore per day. The machinery installed this year furnishes facilities for handling approximately 2,800 tons per day. The ultimate aim of the management is to increase the equipment until it will be possible to treat from 3,800 to 4,000 tons of ore per day. Under present conditions it is impossible to find sufficient men to carry on maximum production, and the output for the time being will perhaps be kept at about \$400,000 per month. This production is resulting in the accumulation of a considerable surplus. The recent developments on the 400-foot level of the Miller-Middleton is perhaps the most important in the history of Porcupine. When it is remembered that the annual report for 1916 stated that the average value of ore in the mine was less than nine dollars per ton, the importance of the discovery of the tremendous body of high-grade ore in this newer portion of the mine may be realized.

#### Newray.

The Crown Reserve Mining Company of Cobalt, who recently optioned the Newray property at Porcupine, are understood to be meeting with encouraging re-

sults. The ten stamp test mill on the property is running, and it is reported that a satisfactory mill head has been established. The new control is going about the exploration and development of the property in their usual practical and systematic manner.

#### Davidson.

The equipment for the erection and installation of the new mill for the Davidson property is now on the ground and the work of installation will be proceeded with at once, and if weather permits, it is expected the plant will be completed and in operation in schedule time. Some delay was experienced in the delivery of certain parts, but, according to the latest advice, this has been overcome.

#### Dome.

At a meeting of the directors of the Domes Mines, held on November 26th, it was decided to close down the mill for the present and to continue shaft sinking and development on the known ore bodies, besides keeping the diamond drills at work on exploring operations. It is understood that a sufficient number of men is available to continue the development of the property on a considerable scale, and that when normal conditions are restored the development of ore reserves of the property will be unusually well advanced.

While nothing official can be learned of developments at the 800-foot level of the mine, these are said to be of a decidedly bullish nature. It was stated some weeks ago that the crosscut at this level should tap the large 117 foot wide orebody indicated by diamond drilling about a year ago about the 15th of November. It is a fact that the crosscut is now either actually in this orebody or very close to it. It is also interesting to note that according to the annual statement of the company the ore encountered in this huge body was of a value at least three times as high as the average run of the mine. The shortage of labor is still keenly felt at the mine, but this will be a permanent retarding factor, being attributable only to the war.

#### McKinley-Darragh in Good Shape.

Producing bullion at the rate of 86,174 fine ounces per month, and with the price of the product running around 85c per ounce, the McKinley-Darragh Savage is in a financial position equal to the best days in its history. The gross annual yield at the present rate of production would aggregate approximately \$878,974. Developments at the lower workings of the mine have proved the existence of ore to a larger extent than was anticipated. The new oil flotation plant will also soon be in full operation, and there is every reason to expect that 1918 will be one of the most prosperous years in the history of this mine. The regular three per cent. dividend, which is due the first of January, will bring the aggregate dividend disbursements up to \$5,146,197.34, which is equal to 229 per cent. of the issued capital stock of the company.

#### Mining Corporation's Big Production and Expansion.

In point of production the Mining Corporation of Canada continues to lead all silver producers under the British flag. Silver is now being produced at this property in Cobalt at the rate of 425,690 ounces per month, or upwards of seventeen tons of bullion every thirty days. The valuation of the production for the present year is estimated at approximately \$4,086,624.00, and the production in ounces of silver will be 5,108,280. This is a wonderful record and eclipses all previous performances of this company. The rate of production has shown a steady increase since the year 1909, when



the total production amounted to 442,254 ounces. When the fact is taken into consideration that the price of silver during the past year has averaged nearly thirty per cent. higher than during the preceding year, it naturally follows that the returns at this mine will be correspondingly higher than they were during the year 1916.

The company has recently purchased the Alexandra property and the Waldman in the Cobalt camp, taken an option on the Hyland claims at Gowganda, and commenced development under option, on the recently discovered claims in the Rickard Township gold district. It is also reported that they are negotiating for purchases of the control of the stock of the Lucky Baldwin mine at Kenogami. Thus it will be seen that the company is pursuing an aggressive plan of expansion and is fully alive to the opportunities presented in the North.

#### Temiskaming.

The report of Mr. Douglas A. Mutch, on ore reserves and the general outlook at the Temiskaming mine, has proved to be of general interest to the public, as well as enlightening a good many of the shareholders as to the actual conditions prevailing, and has verified preceding reports in every detail. Mr. Mutch's report deals plainly with the conditions existing at the 1,600-foot level of the property below the diabase, and the shareholders are told that there is very little chance of any reward for the sinking of this deep working to the lower contact. There are very few of the shareholders who will find fault with the management for this enterprise, as it was part of the plan of exploration which must necessarily be carried out before ascertaining whether or not the mine was to occupy a place among the has beens, or find below this contact a new source of revenue to lengthen the life of the mine.

#### Coniagas Is Developing Gold Properties.

After having already paid to its shareholders eight and one-half millions of dollars, the Coniagas Mining Company of Cobalt is still yielding up large quantities of silver, and the present year's production will probably exceed one and a quarter million ounces. During the past ten months production has been maintained at an average of 108,479 ounces per month. The value of this output is around \$87,000 per month, or upwards of \$1,000,000 per year. The Coniagas has also comparatively recently acquired two gold properties in the Porcupine district, which, according to present indications, should develop into profit-producers. These properties are the Ankerite and the Maidens-McDonald, which lie adjacent to each other, and are being developed from a three-compartment shaft which is being sunk to the 500-ft. level of the Ankerite property.

#### Peterson Lake.

The half-yearly report of the Peterson Lake Mining Company as of October 31st is as follows: Cash in banks, \$30,992. Unpaid dividends, \$3,667; Balance, \$27,324. Cash on hand, \$44.

Underground work to the extent of 722.5 feet was done during the half year; 2,896 pounds of ore of various grades was developed. An estimate of the value of dumps and slimes not included in the dispute with the Dominion Reduction Company is estimated at \$300,000.

Since the issuing of this report a decision has been given in favor of the company for the large quantity of tailings on their property from the mill of the Do-

minion Reduction Company, which are said to have considerable value.

After thoroughly prospecting the Susquehanna property at the 200-ft. level, it was decided to move the plant to the Mercer workings which adjoin the Nipissing, McKinley-Darragh, Seneca Superior and Provincial mines, and where it is thought the possibility of striking good silver values is no promising.

#### Adanac.

Another shoot of rich ore has been encountered in the working at the North drift of the Adanac at the 310-ft. level, and ore of a sufficiently high grade to bag is being developed. The vein at this point is about three inches in width and is composed of cobalt, with a heavy spattering of native silver. It is agreed by the best geologists in the camp that there are equal chances of encountering orebodies similar to those developed on the Temiskaming property on the Adanac, as the geological conditions are very similar.

#### Provincial's New Mill in Operation.

A new mill, with about forty tons per day capacity, has been put in operation at the Provincial mines at Cobalt. A number of improvements have been added to the old crushing plant and a Groch flotation machine has been installed to treat the slimes. Developments at the property recently have been of a very encouraging nature.

#### Green Meehan.

It is reported that a discovery of more than ordinary importance has been made on the old Green Meehan property at North Cobalt, and operations at this mine will be speeded up in the near future. The original shareholders of the company will not derive any benefit from this discovery, owing to the fact that the property was sold a year or more ago to liquidate debts, and is now privately owned.

#### Another Gold Discovery in Skead Township.

Another gold discovery is said to have been made in the Township of Skead, on the Crawford claims, which are situated on lot 5, concession 6. The outlook in this district is indeed growing more promising each day, and at the present time the great drawback to the development of the promising properties seems to be the lack of transportation and exploration capital. At present the only road to the district is from Englehart, a distance of about 24 miles. A short cut could be made by extending the road from the Miller-Independence mine at Boston Creek to the promising section of Skead, which is a distance of about eight miles. The road from the Miller Independence to the Boston Creek Station is fairly good at the present time. This would reduce the distance from the track to the Skead section by about half its present length.

#### Gowganda.

It is expected that by the new year the place will be installed and underground operations underway at the Castle property in Gowganda, which adjoins the Miller Lake-O'Brien on the south-east and is situated on the continuation of the contact along or near which the latter company is encountering its high-grade ore. A dozen or more men are employed at the property and very encouraging silver values have already been encountered. The distance from Elk Lake, the nearest railroad point, to this property is about twenty-seven miles.

#### Canadian Kirkland.

In the shaft on the No. 2 vein of the Canadian Kirkland property at Kirkland Lake visible gold is in evi-



dence at a depth of 30 feet. This vein is about sixteen feet wide and has been uncovered on the surface for a distance of approximately 600 ft. Another shaft has been sunk on what is known as the No. 1 vein to a depth of 35 feet, and very encouraging values were encountered. At present sinking operations are being conducted by hand and a horse and whim are used for hauling the ore out of the shaft. It is the intention of the company to sink to the 100-ft. level and then cross-cut to encounter the No. 1 vein at this depth, as well as continue other lateral work. New camp buildings are being erected and everything is being made ready for the installation of a mining plant in the near future.

#### NOVA SCOTIA.

The Amalgamated Mine Workers of Nova Scotia have served the colliery operators in the Sydney District with notice of termination of the existing wage agreement as at the end of the year, and have made a demand for an increase in wages ranging from a minimum of 30 per cent. to 75 per cent. advance on existing rates. In face of the large increases given to the colliery workers during the past two years, which have averaged from 35 to 45 per cent., the operators do not consider the demand of the A.M.W. is justified by the circumstances. The main argument of the A.M.W. appears to be that the rate of wages paid in Nova Scotia is less than that paid in the coal mines of the Western Provinces. It is probable, however, that when the Eastern miner comes to the year end he finds himself in a better financial position than the Western miner, and this after all is the true measure of earning capacity. Western conditions cannot be compared with Nova Scotia conditions, as they differ not only in the ratio of living costs, but in the mining conditions. If the miners of Nova Scotia desire to introduce the western scale of wages it will be necessary also to introduce the western scale of rents, and of food and clothing costs, on the one side, and the western scale of coal selling prices on the other. In this connection it is worth noting that many eastern miners have gone west and have been glad to beg passage money home after their savings had been exhausted.

It is so manifestly impossible that the coal operators will be able to grant the increase asked by the A.M.W. that a failure to agree may be confidently anticipated. The appointment of a Conciliation Board may therefore be looked for, as it is certain that no stoppage of work can be tolerated at this time.

Arising out of the Waterford Explosion in July last three prominent mining officials have been indicted by the Grand Jury in Sydney on a charge of manslaughter resting on alleged negligent mining practice. The officials in question are two members of the staff of the Dominion Coal Company, the Superintendent and the Manager of No. 12 Colliery, and the Deputy Inspector of Mines, who is an officer of the Provincial Department of Mines, reporting to the Inspector of Mines. The Coroner's Jury which sat upon the victims of the explosion last August brought in a verdict of gross negligence in mining against persons not named, but did not attempt to justify the verdict by naming any specific breaches of the Coal Mines Regulation Act, nor has it yet been suggested that any such breaches occurred prior to the explosion. A Commission composed of the most capable mining men in the Province, and comprising among its numbers four or five representatives of the Amalgamated Mine

Workers, were unable to assign blame to any person, yet singularly enough, at a Convention of the A.M.W. in Sydney in October, a resolution was passed asking for the dismissal of the officials who were afterwards indicted by the Grand Jury, and for the cancellation of their certificates of competency. The most surprising feature in this incident is the indictment along with the Dominion Coal Company's officials of the Deputy Inspector of Mines. It has not hitherto been held that a representative of the Government held a joint responsibility with the operators of a coal-mine in the Province. On the contrary it has hitherto been supposed that the Inspector of Mines was the superior officer of the mining officials of the Province, and in this connection it may be noted that at the inquest the Inspector of Mines refused to allow the Deputy Inspector to give evidence, holding that the Deputy Inspector was a person empowered by the law to hold investigations and interrogate witnesses, and could not properly be subpoenaed as a witness before a Coroner's Jury enquiring into a mining accident. If the Deputy Inspector of Mines is held to be jointly responsible with mining officials working under his direction a new precedent will be established and one that may have some interesting consequences.

The Amalgamated Mine Workers at the Sydney Convention passed a resolution asking the Provincial Government to establish a compulsory scheme of sickness relief societies at the collieries to which the Government and operators should contribute 80 per cent. of the cost and the workmen 20 per cent. This request lies entirely outside the question of workmen's compensation, which is being administered by the Provincial Workmen's Compensation Board. The Dominion Coal Co. have since the beginning of the year been contributing the sum of 25 cents per month per man to the sickness society, but in face of the unreasonable attitude disclosed by the resolution referred to the Company has discontinued its subscription. As the contribution of the workmen is inadequate to ensure the permanence of the Society on the present basis of benefits the Directors have commenced proceedings to wind up the Society so as to conserve the reserve funds for the benefit of the widows and children and disabled members of the Society now on the Fund which the Society has just sufficient funds to enable it to liquidate in full. For the first time therefore in at least 30 years the Dominion Coal Company's workmen will be without a sickness relief society, a condition of affairs which is much to be regretted, and which the Company has done its very best to prevent.

The seventh annual meeting of the Columbia Section of the American Institute of Mining Engineers, which section has its headquarters in Spokane, Washington, was held at Kellogg, in the Coeur d'Alene district of Idaho, on November 17. There was a good attendance of members and others interested. At the business meeting, Mr. S. S. Fowler, general manager for the New Canadian Metal Company, operating at Biondel, Kootenay lake, B.C., was elected chairman of the section for the ensuing year, and Mr. J. Cleveland Haas, of Spokane, also well known in Boundary and West Kootenay districts of British Columbia, in both of which he has been associated with many mining enterprises during the last twelve years, was elected vice-chairman. Mr. L. K. Armstrong, also of Spokane, another member of the Canadian Mining Institute, was re-elected secretary and treasurer.



## :-: Markets :-:

### 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.  
 Dec. 11, 1917—(Quotations from Canada Metal Co., Toronto).  
 Spelter, 12 cents per lb.  
 Lead, 9 cents per lb.  
 Tin, 74 cents per lb.  
 Antimony, 17 cents per lb.  
 Copper Casting, 34 cents per lb.  
 Electrolytic, 34 cents per lb.  
 Ingot brass, yellow, 20 cents; red, 25½ cents per lb.  
 Dec. 11, 1917—(Quotations from Elias Rogers Co., Toronto).  
 Coal, anthracite, \$9.85 per ton.  
 Coal, bituminous, nominal, \$9.00 per ton.

### NEW YORK MARKETS.

Connellsville Coke—  
 Furnace, 6.00.  
 Foundry, 7.00.  
 Crushed, over 1-inch—  
 Beehive, 7.30.  
 By-product, 6.50.  
 Straits Tin, spot, f.o.b., nominal, 85.00 cents.  
 Copper—  
 Prime Lake, \*23.50 cents.  
 Electrolytic, \*23.50 cents.  
 Casting, \*23.50 cents.  
 Lead, Trust price 6.25 cents.  
 Lead, outside, nominal 6.25 to 6.50 cents.  
 Spelter, prompt western shipment, 7.80 to 7.92½ cents.  
 Antimony—Chinese and Japanese, nominal 15.00 to 15.50 cents.  
 Aluminum, nominal—  
 No. 1 Virgin 98-99 per cent., 36.00 to 38.00 cents.  
 Pure 98-99 per cent. remelt, 34.00 to 36.00 cents.  
 No. 12 alloy remelt, 26.00 to 28.00 cents.  
 Powdered aluminum, 75.00 to 85.00 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.  
 Palladium, \$115.00.  
 Quicksilver (Nov. shipment from California), \$115.00.  
 Platinum—Pure, \$105.00.  
 10 per cent. Iridium, \$113.00.  
 Cobalt (metallic), \$2.70.  
 Tungsten—  
 Wolframite, \$23.00 to \$25.00.  
 Scheelite, \$26.00.  
 Gravel Fluorspar: f.o.b. mines—  
 Prompt, \$28.00 to \$30.00.  
 Contract, year 1918, \$25.00.  
 Silver (official), 85½ cents.  
 \*Government price.  
 Metal Products.—Following quotations represent mill prices and are strictly nominal except in the case of lead sheets and sheet zinc:  
 Sheet copper—Base prices—  
 Hot rolled, 33.00 to 35.00 cents.  
 Cold rolled, 34.00 to 36.00 cents.

Copper bottoms, 41.00 to 43.00 cents.  
 (Shipments from stock 2c per pound extra.)  
 Copper rods—Base prices—  
 Round, 34.00 cents.  
 Square and rectangular, 35.00 cents.  
 Copper wire—Base prices—  
 nominal, 27.00 to 29.00 cents.  
 Brass products—Base prices—  
 High brass, sheets and wire, 28.75 to 30.75 cents.  
 Rods, 25.75 to 27.75 cents.  
 Low brass, sheet and wire, 31.25 to 33.25 cents.  
 Rods, 32.00 to 34.00 cents.  
 Brazed tubing—  
 Brass, 35.87½ to 37.87½.  
 Bronze, 41.25 to 43.25 cents.  
 Seamless tubing—Base prices—  
 Brass, 36.50 to 40.50 cents.  
 Copper, 39.50 to 42.50 cents.  
 Bronze 45.00 to 46.00 cents.  
 Full lead sheets, 9.25 cents.  
 Cut lead sheets, 9.50.  
 Sheet zinc, f.o.b., smelter, 19.00 cents.

### STANDARD EXCHANGE.

(Messrs. J. P. Bickell & Co., Standard Bank Bldg., report the following closing quotations on the Standard Stock & Mining Exchange at the close of business, December 7, 1917.)

Gold.		
	Bid	Ask
Apex . . . . .	.05½	.06
Boston Creek . . . . .	. . . .	.28 . . . .
Dome Extension . . . . .	.09	.10
Dome Lake . . . . .	.13½	.14½
Dome Mines . . . . .	6.75	6.85
Imperial . . . . .	.01½	.02
McIntyre . . . . .	1.37	1.38
Hollinger . . . . .	4.90	5.05
Newray . . . . .	.36	.38
Porcupine Crown . . . . .	.20	.25
Vipond . . . . .	.20	.21
Preston East Dome . . . . .	.02½	.03½
Teck-Hughes . . . . .	.26	.29
West Dome . . . . .	.14½	.15
Silver.		
	Bid	Ask
Adanac . . . . .	.12	.12½
Bailey . . . . .	.06	.06½
Beaver . . . . .	.29½	.30
Chambers-Ferland . . . . .	.11	.12
Confagas . . . . .	3.00	3.25
Crown Reserve . . . . .	.21	.23
Gifford . . . . .	.03½	.04
Great Northern . . . . .	.04	.05
Hargraves . . . . .	.08½	.09½
Hudson Bay . . . . .	. . . .	40.00
Kerr Lake . . . . .	4.85	5.15
La Rose . . . . .	.35	. . . .
McKinley . . . . .	.56½	.60
Nipissing . . . . .	8.15	. . . .
Peterson Lake . . . . .	.11½	.13
Right of Way . . . . .	.04½	.05
Seneca Superior . . . . .	.01½	.02
Silver Leaf . . . . .	.01	.02
Temiskaming . . . . .	.27½	.28
Tretheway . . . . .	.12	. . . .
Wettlaufer . . . . .	.04½	. . . .
Provincial . . . . .	.45	.46



# CUT GEARS

For Mining Machinery



*Quick Delivery and Close Prices on Spiral Gears*

GET OUR QUOTATIONS

**Hamilton Gear & Machine Co.**  
Van Horne Street, Toronto

## Smokestacks

48 in. x 111 ft. x $\frac{1}{8}$ "	\$700.00
42 in. x 76 ft. x $\frac{1}{8}$ "	550.00
32 in. x 35 ft. x $\frac{1}{4}$ "	350.00

Lots of Others—What do you Need?

## Air Receivers

2 6 ft. x 18 ft. x $\frac{1}{8}$ " plate	\$650.00 each
2 4 ft. x 15 ft. x $\frac{1}{8}$ " plate, all fittings	600.00 each

We can ship you COMPRESSORS with above.

**WE GUARANTEE EVERYTHING WE SELL** to be in first class operating condition and exactly as specified.

We can ship you **AT ONCE** anything from a 70-ton locomotive to a keg of spikes. **TRY US!**

## Rails

3,500 feet 80-lb. at	\$60.00 per gross ton
75 tons 45-lb. at	60.00 per gross ton
2 miles 30-lb. at	60.00 per gross ton
2,500 feet 25-lb. at	40.00 per gross ton
2,500 feet 16-lb. at	40.00 per gross ton

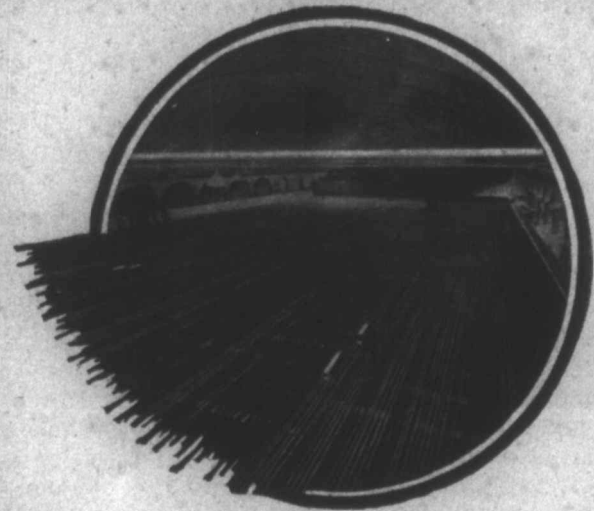
All good shape. With fish plates and bolts. We can equip a complete railroad from stock, including rails, ties, locomotives and cars. **WE HAVE DONE IT.**

# BURNS & ROBERTS

Bank of Hamilton Building

TORONTO

## OxyAcetylene Welding and Cutting



## Two Thousand Joints in Ten Miles of Piping Made Leak-Proof at Less Cost

This illustration shows the groundwork of 2-inch ammonia pipe which forms the u.o. of one of the largest artificial ice rinks in the world. The size of this immense rink is 210 ft. by 90 ft. Ten miles of piping was required, and every one of the 2000 joints was welded by the Prest-O-Lite Process at a substantial saving in cost over the old-style threaded joint. Moreover, the work was neater and smoother as well as stronger, because the welded joint is as strong as the pipe itself.

**Prest-O-Lite**  
PROCESS

has become standard practice on steel pipe lines in thousands of factories and plants. It is widely used in the construction of piping systems for steam, gas or air—in office buildings, hotels, factories, power plants, mines, machine shops and refrigerating installations.

The Prest-O-Lite Process employs both gases (acetylene and oxygen) in portable cylinders. Prest-O-Lite Dissolved Acetylene (ready to use) is backed by Prest-O-Lite Service, which insures prompt exchange of full cylinders for empty ones. Provides dry, purified gas, insuring better welds, quicker work and lower operating cost. Adaptable for oxy-acetylene cutting by the addition of a special cutting blow pipe.

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

Write for valuable illustrated literature and data on work others are doing by this process, in construction, manufacturing and repairing. It may prove to be the solution of your problems.

Address Dept...

**The Prest-O-Lite Co., Inc.**

Canadian General Offices

Prest-O-Lite Building  
Cor. Elm St. and Centre Ave.  
TORONTO

Direct Factory Branches; Canadian Plants;

Toronto, Ont.  
Montreal, Que.  
Merritton, Ont.,  
Winnipeg, Man.

Toronto, Ont.,  
Merritton, Ont.,  
St. Boniface, Man.,  
Shawinigan Falls, Que.



**World's Largest Makers of Dissolved Acetylene**



## SILVER PRICES.

	New York. cents.	London pence.
November 21.....	85¼	43¼
" 23.....	84½	42½
" 26.....	84¼	42¾
" 27.....	84¼	42¾
" 28.....	84¼	42¾
" 30.....	84¼	42¾
December 1.....	85%	42%
" 3.....	84¼	42%
" 4.....	85%	42%
" 5.....	85%	42%
" 6.....	85%	42%

Announcement has been made that the annual conference of mining men of the Northwest and representatives of affiliated industries, will be held in Spokane, Washington, during the week of February 11 to 17, inclusive. Preparations are already being made for the convention, which, in view of war conditions and other factors bearing on the mining industry, promises to be of unusual interest and importance. The mining conventions and exhibitions held periodically in Spokane are usually well attended by mining men from British Columbia, especially from Kootenay and Boundary districts, as well as by far larger numbers from various parts of the Northwestern States.

While Ainsworth and Slocan mines that have been shipping lead and zinc ores and concentrates to the Consolidated Co.'s smelting works at Trail have had their market closed for the time being, the Standard Silver-lead Mining Company, operating in the neighborhood of Silverton, Slocan Lake, B.C., is in a better position, for it has a contract under which its zinc product is shipped to Bartlesville, Oklahoma. Things continue to go along much as usual at the Standard mine and mill, though lead ore can not be shipped to Trail at the present time.

At a meeting of the Yukon Council, held in Dawson several weeks ago, the Committee on Mining having reported favorably on the petition of Dr. Lachapelle and associates for aid in development of copper claims on Williams creek, a resolution was passed that the sum of \$1,500 be placed in the Supplementary Estimates for that purpose.

# FILTER PRESSES

FOR MINING AND OTHER  
PURPOSES

Made in Canada

WILLIAM R. PERRIN, Limited  
TORONTO

Reduce Your Haulage Costs With  
A PORTER



The safety and efficiency of compressed air haulage have been brought to the highest standard in Porter Locomotives. To these we have added an economy in cost and upkeep that no man interested in mine haulage can afford to disregard.

Write for full details to-day.

CANADIAN H. K. PORTER CO., 1218 UNION BLDG.,  
PITTSBURG, PA.

## Mine Hoists

Made in 7 sizes, from 10 to 50 Horse Power, with one drum or two drums; any diameter desired.



## STEEL CARS

Either End Dump or Side Dump, or Swivel, to dump either way.

We make these cars in a great variety of styles, and will send photos on application.

SPECIAL CARS made up to customer's design

Marsh & Henthorn,  
Limited  
BELLEVILLE - ONT.



## Steel Buckets

Made any shape, size or style to suit customer.