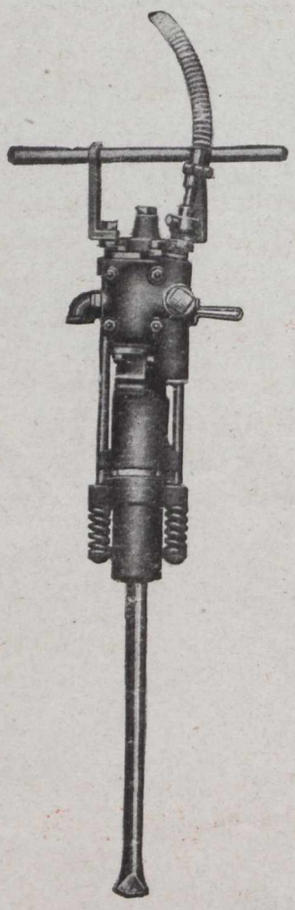
CANADIAN MINING JOURNAL

Vol. XLI. Gardenvale, P. Q., June 25, 1920. No. 25.

ROCK DRILLING RECORDS



H D-4 HOLMAN HAMMER DRILL

The following is taken from the Engineering and Mining Journal issue, May 8th, 1920:

The World's Shaft-Sinking Record

"I NOTE IN YOUR ISSUE OF MACH 13, 1920, P. 470, THAT THE VAN DYKE COPPER CO., OF MIAMI, ARIZ., IS CREDITED WITH HAVING BEATEN THE WORLD'S RECORD FOR SHAFT SINKING, WITH A DISTANCE OF 308 FT. IN 31 DAYS, THE TOTAL DEPTH REACHED BEING 1,063 FT. IT WAS STATED IN THE ARTICLE THAT THE PREVIOUS RECORD HAD BEEN HELD BY THE CROWN MINES OF JOHANNESBURG, AT 279 FT. IN 31 DAYS.

IN ORDER TO KEEP THE PUBLISHED RECORDS OF THIS INTERESTING AND STIMULATING RIVALRY CORRECT, I WOULD POINT OUT THAT THE CROWN MINES HAD ALREADY BEATEN THE RECORD QUOTED IN YOUR PAPER BY SINKING A DISTANCE OF 310 FT. IN JULY, 1919, REACHING A TOTAL DEPTH OF 2,323 FT. THE VAN DYKE COPPER CO. WILL HAVE TO DO A LITTLE BETTER IF IT WISHES TO HOLD THE PALM EVEN FOR A BRIEF PERIOD.

HUGH F. MARRIOTT."

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MINES BRANCH

Recent Publications

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

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

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

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

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

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

The Value of Peat Fuel for the Generation of Steam, by J. Blizard, B.Sc.

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

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

Summary Report of the Mines Branch, 1918.

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

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

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

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

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

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

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

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

GEOLOGICAL SURVEY

Recent Publications

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

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

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

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

Memoir 111. The Silurian geology and faunas of Ontario peninsula and Manitoulin and adjacent islands, by M. Y. Williams.

Memoir 113. Geology and mineral deposits on a part of Amherst township, Quebec, by M. E. Wilson.

Memoir 114. Road material surveys in the city and district of Montreal, Quebec, by Henri Gauthier.

Memoir 115. Geology of Matachewan district Northern Ontario, by H. C. Cooke.

Memoir 116. Investigations in the gas and oil fields of Alberta, Saskatchewan and Manitoba, by D. B. Dowling, S. E. Slipper and F. H. McLearn.

Memoir 117. Geology and ore deposits of Ainsworth mining camp, British Columbia, by S. J. Schofield.

Museum Bulletin 30. Gabbros of East Sooke and Rocky Point, by H. C. Cooke.

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

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

Map 185A. Sandon (Slocan and Ainsworth Mining Divisions). Topography.

Map 1584. Blairmore, Alberta. Geology.

Map 1691. Buckingham, Hull and Labelle counties, Quebec. Geology.

Map 1705. Thetford-Black Lake area, Quebec. Topography

Map 1707. New Glasgow, Pictou county, N.S. Topography.

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

Map 1724. Sheep River, Alberta. Geology.

Map 1726. Athapapuskow Lake region. Geology.

Map 1739. Portions of Bristol, Onslow, McNab, Fitzroy and Torbolton townships, Quebec and Ontario. Geology.

Map 1742. Ainsworth, Kootenay district, B.C. Geology.

Map 1793. Matachewan, Timiskaming district, Ontario. Geology.

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

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

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

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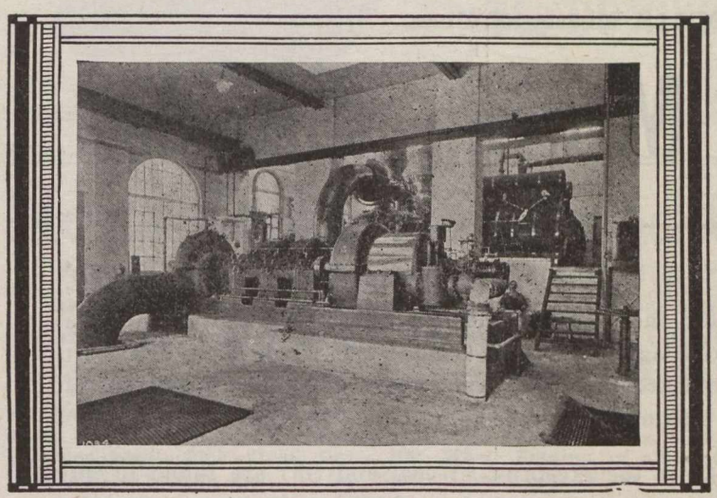

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Ontario's Mining Lands

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

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

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

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

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

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CONTENTS

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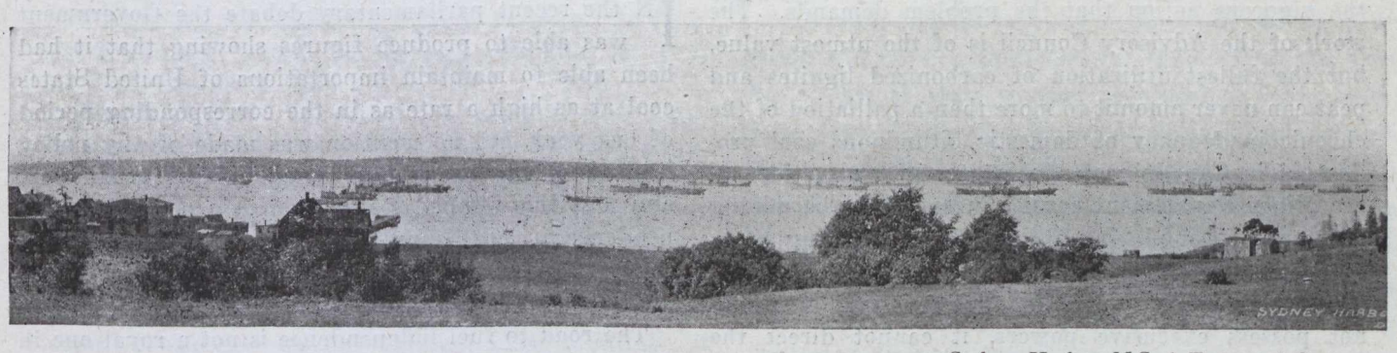

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EDITORIAL

Coal Production in N. S.—Its Bearing on Canada's Fuel Problem

THE coal production of Nova Scotia has recently come into much prominence, and during the month of June a number of significant happenings have been recorded in the newspapers that have brought this long suffering industry to public attention.

A debate took place in the Commons on the general question of national coal supply, which elicited the information that the Government were keeping in close touch with conditions, but left the impression that our parliamentary leaders still look upon the United States as the sheet anchor of coal supply and possess small faith in our domestic resources. In the Senate, the Hon. Smeaton White brought the coal situation before the Government, and brought out the further intimation that the Government would shortly introduce legislation to control the disposal of coal mined in Canada, and that a sub-Committee of the Cabinet, consisting of the Minister of Railways and the Minister of Labor had been appointed to enquire into the whole question of Canada's coal supply **"for the coming season."** The inability of our national leaders to grasp the great importance of the fuel situation is evidenced by the limitation of the enquiry the Government propose. It provides a firsthand illustration of the hand-to-mouth manner in which our national fuel supply has been dealt with, and the partial view that has been taken upon every successive recrudescence of a question that will persist to the end of time, and will affect the national aims and evolution of Canada as no other question does or will do.

We have studied the coal question in Canada for many years, and the conclusion has been forced upon us that **Canada can not persist as a separate political entity in North America unless Canada becomes self-sustaining as to bituminous coal supply.** If any person can point out a way of escape from this conclusion we shall be extremely glad to hear of it. The conclusion is an uncomfortable one, but it is one that should be faced, and **must be faced** if Canada is to pursue in future years that orderly procession of national growth to which every patriotic citizen looks forward.

THE crisis in fuel supply has not come unheralded. Year after year in the columns of the "Canadian Mining Journal" its approach has been forecasted. We trust that our readers will forgive the full quotation that is elsewhere given in this issue of a review of the coal production of Nova Scotia during 1918, reiterating similar statements made in 1917 and 1916. A recapitulation of the conditions attendant upon coal production in Nova Scotia at this time would necessitate identical statements, merely emphasised by their greater seriousness and wider application.

The present inadequacy of coal production in Nova Scotia arises from conditions that were categorically listed in 1916, the year when the output capacity of the collieries in Nova Scotia reached the recorded maximum of tonnage. Almost four years have passed since 1916, and in every succeeding winter a so-called "crisis" in fuel supply has taken place, with temporary excitement and temporary remedies having temporary results. The "crisis" of the coming winter may be greater or less according as Nature is kind, and in proportion to the number and extent of railway labor troubles, but Canada's trouble consists in a chronic fuel insufficiency, arising from neglect to develop the coal seams of Nova Scotia as a source of domestic supply.

THE fuel problem has been studied by various bodies and excellent reports have been made thereon, but there has been no concentration of aim or continuity of purpose in our national fuel policy. Perhaps this is because the problem has not been conceived as a national one, in which private enterprise and occasional departmental enquiry can play only a limited part. The Commission of Conservation has done good work in giving publicity to various phases of the question. The meaning of the term "conservation" has been defined by the Commission as applying to the efficient utilization of natural resources, which is a very happy definition in regard to coal supply. The work of the Commision is definitely limited by its lack of executive powers, and it can do nothing more than point out what should be done. The enquiry of the Manufacturers' Association will doubtless bear good fruit, but it can not be implemented by

the vigorous action that the problem demands. The work of the Advisory Council is of the utmost value, but the fullest utilization of carbonized lignites and peat can never amount to more than a palliation of the chronic inadequacy of domestic bituminous coal production in Canada east of Alberta. The functions of the Mines Department consist in assisting the mining industry of Canada in obtaining and recording scientific and statistical observations, but as the Department works upon a limited appropriation, and does not possess executive powers, it cannot direct the actual development of minerals. The functions of temporary government appointees such as the Fuel Controller and the Director of Coal Operations in the West arise out of temporary emergencies connected with war times and with the evolution of organized labor policies during a time of disturbed social conditions, and such government oversight will presumably disappear when the originating causes pass away.

WE would suggest, for the consideration of the Government, the creation of a permanent body charged with oversight of the fuel suppy of Canada. This body should either be vested with executive powers, or its recommendations should be made the basis of legislation by the usual processes. The suggestion which is here made of what would practically amount to a Ministry of Fuel Supply is admittedly novel, and possibly has no peace-time precedent, but it is submitted in support of the suggestion that Canada's fuel problem has no precedent.

We do not believe that there is any question in Canada that approaches in gravity, or in its bearing on national life, the problem of a fuel supply within our frontiers. Put in another phrasing, the development of our coal resources is necessary to Canada's continuance as a nation, either within the British Empire or without that confederation of nations. We do not state that a development of the coal beds of Canada is essential to the wealth, the personal safety, or the culture of the population of that territorial entity known as Canada, because it is quite possible that all these things may be equally secured by those who may reside in that territory in the future should one political government only remain in North America. Our descendants cannot resist absorption into the United States at some future time if we rely on the United States for coal supply in preference to mining coal at home. No modern nation can persist that does not possess its own bituminous coal supply, except, as in the case of some small European nations, by the consent and the opposed national policies of surrounding nations—in other words, on sufferance. The non-development of our coal resources is precisely equivalent to our non-possession of such resources, and will have precisely the same consequences.

The functions of a Fuel Ministry would be, in certain respects, identical with the functions of a Committee of National Defence.

IN the recent parliamentary debate the Government was able to produce figures showing that it had been able to maintain importations of United States coal at as high a rate as in the corresponding period of last year, but no mention was made of any policy leading to an increase in Canadian coal production, and it is this implied resignation to a position of dependence in coal supply that is so discouraging to those who know that Canada can become self-supporting, if she wills to be so.

The road to fuel independence is not a royal one in Canada. Increase in coal production is only possible by large expenditures in development and by a large increase in the numbers of the coal-mining population. These things take time and thought, and what is planned today cannot bear fruit for years, and may be for decades. As an instance of popular misconception, a statement recently went the round of the newspapers that the Dominion Coal Company had "ordered" the immediate increase of its output to 20,000 tons daily. As bearing on this, it may be recollected that at a recent meeting of the Dominion Steel Corporation the President referred to the retarded development of the collieries and mentioned the shrinkage in output capacity occasioned by the lack of development expenditures during the war period. Deferred mine development can never be overtaken. Similarly, it is never possible to obtain emergency supplies from coal deposits unless the mines are at all times maintained in a position to put out coal. If Canada can only produce 13,000,000 tons of bituminous coal annually from her mines, there is no comfort in the thought that we own the second largest coal reserves in the world. All we can call our own; all the coal that is of any use to this country is 13,000,000 tons annually. We could use 30,000,000 tons annually. The United States is actually producing 700,000,000 tons annually.

WE admit that at the present time it is cheaper and easier to buy coal from the United States than it is to mine it and transport it to market in Canada. Canada's fuel difficulty is a consequence of her separate national existence in North America. If Canada desires to continue as an independent political entity in North America she must accept the fuel problem and overcome it. It is not possible to have one's cake and eat it too.

LIGHT RAILWAY FOR GOWGANDA.

The company which has undertaken to build a light railway into the Gowganda silver mining district is now selling bonds to finance the enterprise and it is expected that the railway will soon be built.

The great nickel-copper industry of the Sudbury district has grown from the discovery of ore during construction of the Canadian Pacific Railway and the silver mining industry of Cobalt dates from the

discovery of silver during the construction of the Temiskaming and Northern Ontario railway. In both cases railway transportation was available as soon as there was ore to ship.

There are great advantages in being located close to the railroad and those who endeavor to make mines in any other location find the burden of road construction a hard one. Too often the lack of vigor in attacking the transportation problem results in failure to develop promising mineral deposits in Ontario. A property lying a few miles away from a railroad is often considered as inaccessible. The building of light railroads and waggon roads to serve such mining districts would result in greatly increased development of the mineral resources.

It is to be hoped therefore that the men who are enterprising enough to build a ilght railroad to Gowganda will be well rewarded for their effort and that the success of their venture will lead to more ambitious plans for the opening up of Ontario's hinterland. Then we will have more intensive prospecting in areas that are at present ignored because of distance from the few railways that cross the country. The Government railways will be benefited by the business that will come from new mining districts reached by waggon roads and light railways. It is in the general interest that such feeders to the trunk lines be constructed.

Conditions Attending the Mining of Coal in Nova Scotia

By The EDITOR

"The situation of the coal industry in Nova Scotia at the close of 1918 is similar to that at the end of 1917, but very much worse, and a description of the state of affairs today would necessitate practically a repetition of the statements made in the New Year Edition of The Morning Chronicle a year ago.

> 'The reduction of the production of coal
> 'in the years 1914, 1915 and 1916, and the inevi
> 'tably still greater reduction in 1917, is a mat-
> 'ter of very serious moment from any angle at
> 'which it may be viewed.'

Last year this statement was quoted, with the further remark that 'the complete certainty of a still further reduction in 1918 only adds greater emphasis to this 'statement.'

Unfortunately the writer's forecast of 1918 production—and he has been accused of pessimism—was too optimistic. A production for 1918 was forecast about 5,400,000 tons, but the actual figures for this year will not exceed 5,175,000 tons.

It is also unfortunately only too certain that the production of the year 1919 cannot materially exceed that of 1918, but the trade outlook is too uncertain to warrant any definite forecast of production.

In commenting on the production shown by the 1917 figures, the presence of an even more serious feature, namely, "the probability of a 'continuance of the di-'minished rate of coal production for a number of years 'to come, and this from causes not dependent on the 'length, or the outcome of the war" was forecasted.

Some of the causes for this opinion may be mentioned. Certain of these causes were operating before the war, as was pointed out in 1916; others are the result of the war during its continuance, and others again are now coming into operation as the combined result of pre-war tendencies and causes originating in the war and its aftermath.

Causes operating before the war were the coming exhaustion of many of the collieries then in operation, a number of which have in the meantime been abandoned; and the steadily increasing physical difficulties attending the extraction of coal because of the practical exhaustion of the land areas and the larger percentage of coal that must be mined from submarine areas to maintain the rate of output.

Another pre-war cause was the low selling price obtainable for coal, assisted by an incomplete apprehension among the operators of the ultimate and true cost of producing coal over a long period of years. The long continuance of low selling prices had before the war reduced the coal companies to a state of financial embarrassment that but for the stimulus of the war would have in the meantime forced them into liquidation, that is, such of them as were not already in that condition.

Comparison of Output

The production of the larger companies compare with the year before the war as follows:

	1913	1917	1918	1919	1920 Estimated
Dominion Coal Company	5,120,573	3,916,548	3,639,312	3,481,079	3,600,000
Nova Scotia Steel Company	813,877	577,171	502,018	550,965	575,000
Acadia Coal Company	539,121	398,507	277,526	407,326	500,000
Intercolonial Coal Company	189,550	179,700	176,814	185,417	180,000
Inverness Coal and Ry Co.	293,847	202,719	204,495	139,200	
Maritime Coal and Ry. Co.	155,051	200,000	180,000		545,000
Other operators	151,466	192,355	233,095	396,013	
Total	7,263,485	5,667,000	5,213,260	5,160,000	5,400,000
Percentage of production from Cape Breton Island	81½ p.c.	78 p.c.	77½ p.c.	75½ p.c.	73 p.c.
Reduction from the basis of 1913		23 p.c.	28 p.c.	29 p.c.	25 p.c.

During the war period the production has declined in a manner that can be understood from the following tabular comparison of outputs:

Output of Nova Scotia Collieries. (Long tons).

1913—7,263,485
1914—6,500,031
1916—6,171,424
1917—5,667,000
1918—5,213,260
1919—5,160,000
1920—5,400,000 (Est.)

It is well understood that the reduction in outputs during the war period is due to enlistments in the army, and no useful purpose is to be served by discussing this phase of the matter. The producing capacity of the collieries might be restored so far as workmen employed is concerned, by returning to the collieries the men who left in the same proportions in which they were taken, but this is hardly possible, because there is a permanent loss of miners due to losses during the war, and to the fact that only a proportion of the men who went away will return to work at the collieries.

Composition of working Forces.

The working forces at the collieries today contain a larger proportion —a much larger proportion—of auxiliary or non-producing workmen than is necessary The composition of the working forces at the collieries is in fact so inefficient and uneconomical that it cannot continue.

The truth is that there are more men employed in transporting and handling the coal to-day than were employed when the maximum outputs of 1913 were being obtained but the number of actual producers has been reduced by -half. As the writer stated last year it is not implied that a smaller number of auxiliary workers could handle the outputs now being produced, but it is certain that the same number of men could handle twice as much coal as they are now doing.

Capacities of Collieries Reduced

The lack of capital during the first two years of the war, accompanied during the last two years by a shortage of workmen and inability to obtain deliveries of machinery and structural material, has resulted in reducing the capacity of the collieries for output, so that, no matter how large the number of men that could be obtained for work in the collieries, the production cannot be increased materially until the production of the advance work underground is made possible by several years work.

The combination of reduced outputs, increased rates of wages and material costs, inefficient working or ganizations and increased transportation costs and increased physical difficulties of extraction have brought the costs of production to an unremunerative point, and to a point that makes competition with American coal impossible. At the present time, and for some years, no Nova Scotian coal to speak of has gone to the Montreal market, but before the war two million tons per annum were sent there, and presumably this market must once more be looked to by coal operators in this Province.

Increased Cost of Production.

While there is a certain abnormality in the local coal situation which will gradually disappear as world affairs swing into into the old accustomed channels, yet there are certain features which will affect the coal trade here either permanently, or over a long period to come. A permanently increased cost of production has been brought about by the increased physical difficulties of mining, by altered standards of labor return for money expended in wages, by increased costs of material, on which similar influences have been exerted to those that have gone to increase the price of coal production; by increased taxation imposts, and by recently enacted laws such as the Workmen's Compensation Act and the weekly pay. No comment is here indicated on the advisability of these laws. They may be very advisable, and the trend of political thought should prepare us for even more radical legislation along these lines, but it is sufficient for the present argument that they have directly increased the cost of coal production.

Added to and accompanying this factor of increased costs of production, is the lessened capacity of the mines for output, a condition that must persist until peace has restored the years that the war has eaten.

There is also the permanent loss of mining population occasioned by the heavy enlistments of miners. This is without doubt a permanent factor, and one which will have to be reckoned with, as the drain of enlistment was concentrated on a selected class from a selected employment. The importation of workmen from Europe will be necessary to supply the labor shortage when the present slack and hesitancy in business has passed away and the essential soundness of Canada's future is revealed once more, but foreign importations cannot make up for the loss of the native Nova Scotian miner, who is a disappearing asset of this Province.

The summation of the foregoing factors do not permit optimism regarding the future of the coal industry in Nova Scotia."

(Re-published, with the addition of the figures of production since recorded, from the Halifax "Morning Chronicle" of January 1st., 1919.)

The deterrents to production above enumerated are not altered in kind, but they are more definite and permanent than when the foregoing was written. There is at this time at the collieries a shortage of production labor, and a surplus of non-productive labor, labor that insofar as it is surplus is also useless. The output capacity of the collieries is reduced, and its restoration will take years to effect. Permanent reduction in the resident mining population has taken place. This loss can only be made good by immigration. Increased cost of production and decreased hours of labor are also permanent factors, likely to increase in severity.

The conditions are of a nature that will not ameliorate under a waiting policy, but require drastic remedies. Some of the measures that would offset the small production and increased cost of coal—to a large extent cause and effect—are a reduction of the non-productive labor employed, large recruitment of productive labor, the adoption of double or treble shifts, and the immediate expenditure of money and labor on the development of new mine openings.

No single factor of development can have such an increasing effect on production as the unified manageement of the Sydney coalfield properties which will be possible if and when the consolidation of the companies takes place that is proposed under the charter of British Empire Steel Corporation. Upon the consummation of this event it will be possible to immediately enlarge the area of working faces tributary to collieries that are now circumscribed by lease lines

preventing further advance of the working places. The output of a number of collieries could under such conditions be much enlarged without important expenditure, and without necessitating the employment of additional non-productive labor. The coal which can be produced by working faces now idle can be handled by the men now necessary to deal with a very much smaller output of coal.

The proposed consolidation could not be undertaken at a more opportune moment in regard to the future development and the planning of new collieries. If this opportunity to plan out the future winnings of the Sydney Coalfield is taken it will enable a thing to be done that has always been eminently desirable but never previously possible, namely, the conception of the Sydney field as one continuous deposit, and the laying of plans for its development to serve one individual interest. The possibilities for simplification of the engineering problems, for economies in haulage, ventilation, pumping and generation and transmission of motive power; for the proper rotational working of the superimposed coal seams; for the adoption of improved technical methods, for comprehensive vision and resulting efficiency, are as immense as they are fascinating. Always provided that the direction is competent, the opportunity is unique, and if it is taken, the results will justify the dreams of those who have visualised the Sydney Coalfield as one that can only give its maximum yield under single management.

THE RE-OPENING OF SILVER ISLET MINE

J. J. O'Connor

The Silver Islet Syndicate are meeting with gratifying results in their explorations underground, in this famous old mine. The unwatering operation is proceeding at an easy pace, the level being kept just below the samplers, who are now sampling the upper levels and slopes. One hundred samples were dispatched to Haileybury on the 14th inst for analysis.

The airlift discharges one thousand gallons of water per minute. It is in striking contrast to the old Cornish pump, formerly in use, and still in position, that only had a capacity of about fifty gallons per minute, but yet, had no difficulty in keeping the mine dry. The power required for the air-lift, is scarcely one quarter of that used in operating the old pump.

Superintendent Greener announced today, that they had encountered a body of high-grade ore, 25 ft. in length, and from 18 to 27 inches in thickness, varying in values from 1,000 to 2,000 ounces per ton, about halfway down to the first level (approximately 35 feet below the surface) in the roof.

The Syndicate is to be congratulated on having its faith confirmed, at such an early date in its operations, and it is hoped that its enterprise will meet with the reward it deserves. It again suggests the old question: Will Silver Islet come back?, Will it again take its old place as one of the leading silver producers in this Province? It is sincerely hoped that it may, and that its whistle, which blew a few days ago, for the first time in 36 years, may long continue to echo along the frowning shore line.

The Hon. Harry Mills, Minister of Mines, had the honor of starting the engine, when the present operations were begun. Captain James Cross, a veteran of over 50 years at this mine, hoisted the flag that was flown on the beginning of mining operations, by the Silver Islet Consolidated Mining Company, in 1870. The ore discovered is "macfarlanite" and is peculiar to Silver Islet.

BOOK REVIEW.

MANUAL FOR THE OIL AND GAS INDUSTRY, by Ralph Arnold, J. L. Darnell and others. John Wiley and Sons, New York.

This book has been compiled for the purpose of assisting the taxpayer of the oil and gas industry in preparing his Federal tax returns. It is consequently of comparatively little interest to Canadians, but those in the oil and gas industry will find in it much useful information for there is dealt within the book matters that vitally affect all companies here as well as in the United States. Part II of the volume deals with depreciation. Part III consists of descriptions of methods of estimating underground oil resources. The data given are based on a systematic study of thousands of production records by the Bureau of Mines.

NEW MAP OF THE RICE LAKE MINING DISTRICT MANITOBA.

The "Journal is in receipt of two sample maps of the Rice Lake District of Manitoba, one printed on thin paper and the other printed on stout paper, issued by the Topographical Surveys Branch of the Department of the Interior. We are advised by Mr. E. Deville, the Surveyor-General that this map shows all the surveys in the district and will be sold by the Branch at a nominal price. The map is on a scale of one mile to the inch, showing the Manigotan River and its lakes, Rice Lake and the Wanipigow Lake and river. The recorded claims are plotted and the map contains a schedule showing all the surveyed claims, giving location and lot number. An inset to the map shows the relation of the Rice Lake District to the province of Manitoba. The publication of this map will fill a public demand, and the Topographical Surveys Branch is to be congratulated on its opportune appearance.

TORONTO NOTES.

The directors of Ontario Kirkland Mines were in Toronto on Saturday last on their way back to Philadelphia, after having attended the annual meeting at the camp last week. It was decided to commence at once the erection of a mill and ground will be broken for a mill of one hundred-ton capacity.

A circular has been issued by the Teck-Hughes Mine in which it is intimated that some scheme may be arranged to reorganize the company and by increasing the authorized capital to effectually cope with the financial situation which has arisen, and which made it impossible to meet the payment of bonds which fall due to October. The mine is understood to be now on a profitable producing basis and that by the financial adjustments now in progress the affairs of the company may be worked into a sounder basis.

Mr. G. F. Hendricks, representing the firm of J. S. Rose of New York city, dealers in Industrial Diamonds for Mining Drills and diamond pointed tools, has opened a Canadian office in Toronto in the Page Building. The firm is sales agents for L. M. Van Moppes and Sons and J. K. Gullard, Ltd., of London, Eng., two of the largest dealers in this line in the world. Mr. Hendricks is well known to the Canadian mining industry, being a mining engineer who has spent considerable time among the mines of Northern Ontario.

An Occurrenee of Tin near the Ontario-Manitoba Boundary

(J. S. DeLURY).

In an article[1] which appeared recently, attention was called to the occurrence of tin in some bodies of sulphide minerals found in the vicinity of West Hawk and Star Lakes near the boundary line between Ontario and Manitoba. Since the writing of that article some additional information has been obtained in regard to these deposits and attention is being called to them again not on account of their commercial possibilities, for the tin is apparently not sufficiently abundant for profitable extraction, but on account of the interesting manner of occurrence and the mineral associations.

The reported occurrences of tin in Canada are few and none of them are of commercial importance. Reports of sulphide tin are exceptional, though it is believed that this form of tin is more common than is generally supposed. The difficulty of detecting small quantities of tin in combination with sulphur suggests that most commercial assays would fail to indicate its presence.

Geology.

The geology of the area in which the stanniferous sulphides occur has been briefly discussed by the writer in some articles[2] written on the occurrence of molybdenum and tungsten in the same locality and sketch maps were made showing the outcrops of rocks and geographical features, so that here only brief mention will be made of the relations existing between those rock units of the area which are of importance in conection with the ore-minerals. The formations are similar to those described by Lawson as appearing in the Lake of the Woods District and are all of pre-Cambrian age.

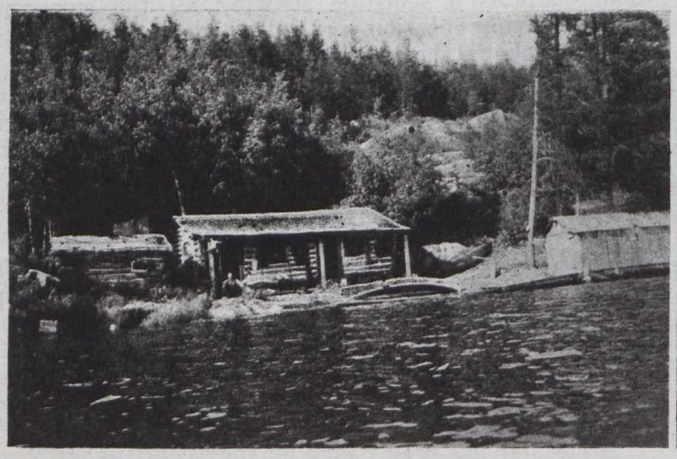
A biotite granite, mostly coarse-grained and reddish in appearance, is the youngest rock. It has intruded all the other types of the area. The ore-minerals are found largely in a belt of schistose rocks which is bounded by the intrusive granite on either side. The schists are largely of the hornblende variety and were derived from basic lavas. Metamorphosed conglomerates and other sediments are also found in the belt. The granite body appears to have been the source of most of the ore-minerals and, at different times during the later stages of cooling, there passed out from it mineral deposits of several forms and materials. There are some deposits in the locality which may not have been derived from the granite. In the list of occurrences which are now to be described, only those which appear to be directly attributable to the granite will be mentioned.

Pegmatite Dikes.

These are found in the schists, generally within a few hundred feet of the contact with granite. Molybdenite is the prominent economic mineral found occurring in the dikes; it is usually in crystals of good size. Masses of crystals have been found weighing twenty pounds or more and some work done since the showings were examined is said to have exposed many masses even larger than these. A careful search for minerals of tin and tungsten was made in the excavations in the pegmatite dikes; but no trace of any of these was found.

Aplite Dikes.

These are other off-shoots from the granite magma. They are not large and the molybdenite in them is in small crystals and grains and is very irregularly distributed.



Neil Martin and Cabin on West Hawk Lake

Cabin on West Hawk Lake where Tin was reduced in Stove. Neil Martin on the right.

Pegmatitic Quartz-Veins.

Two of these veins have been found. They belong to a transition type between normal pegmatites and quartz-veins. The economic minerals found in thes deposits are gold, bismuth, bismuthinite, molybdenite, arsenopyrite and small amounts of chalcopyrite. This association of minerals is identical with that reported o fthe contents of the Mikado Mine, which lies in the western part of the Lake of the Woods district and only about ten miles southeast of these deposits. There is consequently a strong probability that the Mikado vein and perhaps many of the other quartz veins found on the Lake of the Woods are directly attributable to the intrusion of the same

[1] Transactions, C. M. J. 1919. P. 326.

[2] Can. Min. Journal. Vol. 38. P.460. Can. Min. Journal. Vol. 39 P. 186.

granite that produced the mineralization in the boundary area and which is believed to extend into the Lake of the Woods.

Molybdenite-bearing Quartz-Veins. In some porphyries derived from the granite magma and in adjoining masses of schist are some wide bands occupied by quartz and fractured country rock filled with quartz stringers and carrying fine-grained molybdenite and small amounts of pyrite and chalcopyrite. Channel samples of this material, taken across considerable widths give assays showing a molybdenite content up to one per cent, and values in gold, silver and copper totalling about two dollars to the ton. Very little work has been done on this type of deposit, though considering the possible extent of them and the possibility of finding other and richer bodies of the same nature, it would seem well worth while to investigate the deposits already found and to conduct a search for more.

Scheelite-bearing Deposits. These Seem to have been given off from the granite at a later stage than the deposits which have been already mentioned. Scheelite occurs in altered bands and patches in the hornblende schist in company with epidote, vesuvianite, feldspar and other high-temperature minerals. Small amounts of molybdenite, pyrrhotite, chalcopyrite, sphene and ilmenite are also associated as well as calcite and quartz.

Sulphide-bearing zone in Schist. These zones are numerous and large. They are found chiefly in the vicinity of West Hawk and Star Lakes. The abundant sulphide is pyrrhotite. Pyrite is fairly general in occurrence and in places is abundant. Other minerals found irregularly distributed and in varying though usually small quantity are arsenopyrite, zinc blende, galena, chalcopyrite, scheelite and its high-temperature associates, quartz, calcite and siderite. Low nickel assays have been reported from some of the pyrrhotite. The most interesting feature of these sulphide deposits is the presence of small quantities of tin.

The Occurrence of Tin. Mr. Neil Martin, a prospector who has been in this part of the country since the boom days of the Lake of the Woods district, has for years been roasting samples from these sulphide deposits in his stove and has been obtaining beads of metal from them. Samples of these metals were sent by Mr. Martin to different assayers and tin was reported from some of them. Unfortunately the people whom Mr. Martin informed of this were skeptical and hinted at tin cans, etc., as being the source of the metal. Though samples from the same places as those which furnished the tin were sent to many assayers, no tin was reported. Of the metal samples originally handed to the writer, the first ones examined contained lead or a mixture of lead and zinc, but one was examined which consisted mainly of tin.

An examination of the deposits was then made to ascertain if possible in what mineral the tin is carried. This was difficult, since most of the sulphides are intimately mixed. Many tests were made and of all of them, the original method adopted by Mr. Martin was the most successful. In only one case was a definite mineral found which gave a satisfactory test for tin. This was a sample of what appeared to be chalcopyrite; a good blowpipe test was obtained from this, indicating that the mineral is a member of the isomorphous group between chalcopyrite and stannite. Unfortunately not enough material was left for a complete analysis, but it is hoped that more will be obtained.

Samples from the sulphides lodes were sent to be assayed. Most of the returns showed less than one per cent of tin; a typical set of samples showed 0.18, 0.18, 0.00 and 0.30 per cent of the metal.

Mr. Martin deserves great credit for his persistence and ability in demonstrating the existence of tin and the public who doubted his findings owe him an apology and a deal of praise.

Though a careful search has been made in many of the more promising places, no cassiterite has yet been found in the area.

The Origin of the Sulphide Lodes. The writer has not completed his examination of the sulphide bodies so that the following ideas concerning them must not be regarded as final conclusions, though the evidence is strong that they are correct.

The fact that the molydenite came from the granite is obvious. The association of this mineral with scheelite, bismuth minerals and gold connects the deposits carrying these metals also with the granite. The occurrence of scheelite in the sulphide lodes points to the granite as the source of the sulphides. Finally the presence of tin, so generally associated wtih granites and so commonly found with tungsten and molybdenum, shows beyond much doubt that many of the constituents of the sulphide lodes came from the granite. That the sulphide lodes are subsequent to the granite in their formation is indicated by the fact that a pegmatite dike, apparently an off-shoot from the granite, is seen at one place to be impregnated and partly replaced by sulphides connected with one of the principal deposits.

Origin of Lake of the Woods Gold and Bearing on the Economic Geology of the Vicinity. It has been pointed out that the associations of minerals indicate a similarity in origin between the gold-bearing veins of the Lake of the Woods and the mineral deposits of the district near the Boundary, which have been connected with the intrusion of a particular granite. It would be expected that this same granite would be found in the Lake of the Woods. Lawson's description of the granites of that area leads to the belief that this inference is correct.

There is reason for hope that deposits of tin and of tungsten will be found in the Lake of the Woods area. The wide distribution of molybdenite there adds considerably to the hope. It is more doubtful that commercial deposits will be found. Many of the larger deposits near the boundary appear to be too low-grade and the richer ones are generally too small to be considered. It is to be hoped that some of the bodies already found will prove to have the right combination of size and richness to be workable and that further prospecting in the Lake of the Woods area will bring some more of these interesting deposits to light. The general attitude of apathy and condemnation assumed towards the Lake of the Woods country are not altogether warranted.

It should be added that in view of the association of silver with tin in some valuable sulphide deposits in Bolivia and Tasmania, several samples from the sulphide lodes were assayed by the writer. No silver was found in any of them.

Mr. Stuart A. Marvin, of the firm of Fleming and and Marvin, 1102 C.P.R. Building, Toronto, has formed a partnership with Mr. H. Herbert Scarlett, formerly with Bryant, Isard and Co. The new firm will operate under the old firm name and will conduct a general stock brokerage business, dealing in securities in all markets.

Nova Scotia Notes

Changes in the Official Staff of the Dominion Coal Co. Resignation of Messrs. Tonge and Herd.

Recent changes in the staff of the Dominion Coal Company have involved the resignation of Mr. A. J. Tonge, the General Superintendent of Mines and Mr. Walter Herd, the Mining Engineer of the Company.

Mr. Tonge was appointed Mining Engineer of the Dominion Coal Company in 1912. When Mr. D. H. McDougall was appointed General Manager of the Dominion Steel Corporation and removed his office to Sydney, in 1917, Mr. Tonge was appointed General Superintendent in charge at the collieries. At the Annual Meeting of the Mining Society of Nova Scotia in May,, he was elected to the office of President of the Society. He is also a Councillor of the Canadian Mining Institute. Previously to coming to Canada, Mr. Tonge was General Manager of the Hulton Collieries in Lancashire, England, where he succeeded his father as certificated colliery manager, and was in charge of operations for 29 years. He is a past-President of the Manchester Geological Society. During Mr. Tonge's service with the Dominion Coal Company he has had to deal with several difficult mine fires and explosions, at the Springhill Mines and at No. 12 Colliery in the Lingan district, and he was consulted with regard to the extinction of the mine fire at the Allan Shafts, Stellarton, and the re-opening of this mine. A large number of additions and improvements have been made under Mr. Tonge's directions to the motive-power and mechanical equipment of the Dominion collieries, but latterly, owing to the time occupied by executive duties and the adjustment of labor questions, Mr. Tonge was unable to devote much time to the technical questions of mine operations

MR. WALTER HERD

Mr. Walter Herd had been with the Dominion Coal Company about two years when war broke out, and, on the nomination of the Canadian Mining Institute was given a commission in one of the Tunneling Units. He later transferred to the Canadian Forestry Corps and served throughout the war, during which time he had oversight of large forestry operations, involving heavy money expenditures. Later he was placed in charge of the inspection of timbering of dug-outs and underground excavations with a view to the economy of supporting timber. During this work he saw much of the heavy fighting of the war. Mr. Herd retired as Lt.-Colonel and has the O. B. E.

Since returning from overseas, Mr. Herd has filled the position of Mining Engineer. Previous to the war he had experience in charge of Springhill Mines, where he was the resident Superintendent. He was also for a time in charge of the iron-ore operations of the Dominion Steel Company at Wabana. His previous experience includes management of collieries in Scotland and South Wales.

A paper was read before the Mining Society of Nova Scotia recently by Mr. Herd suggesting the application of hydraulic stowing to the recovery of the pillars in the first lift of the underseas collieries. (See "Journal" of May 14th and 21st, pp. 384 and 412).

It is understood that Mr. Tonge will return to England, and that Mr. Herd will become a directing officer and a partner in a lumbering company that has its headquarters in Halifax, N.S.

No announcements have been made of any appointments in succession to Messrs. Tonge and Herd in connection with the technical direction of the collieries.

The Dominion Coal Company has been singularly fortunate in attracting the services of mining engineers of wide experience and good reputation, but it has been singularly unfortunate in retaining their services. Within the past fifteen years the Dominion Coal Company has had four successive incumbents of the position of general superintendent of mines, or technical director. Each of these men upon leaving the Company's service obtained positions of greater responsibility and enlarged emolument. The conditions which brought about the severance of these engineers from the connection with the Company have been various, but they have had one constant feature, namely, that they were related to questions of executive policy, and were not in any case referable to the technical abilities or the engineering direction of the development of the collieries.

The unfortunate result of the numerous changes has been to deprive the mining operations of the Company of continuity in the technical direction of its mining operations, and of the fruition of the observations of competent engineers when these had ripened through the necessary length of experience. Each new incumbent in office has had to begin his education in local mining matters where his predecessor began, and the Company has lost all the benefits of accumulated observation and all the advantages which come from continuity of policy and definite aims. The lack of continuity in management has adversely affected the ambitions and life studies of the subordinate officers

of this large Company. The number of officials of long service in the Dominion Coal Company is surprisingly large considering the frequency of changes in management and control, but the repeated changes of technical policy that are inseparable from changes in managerial personnel, tend to discourage the intellectual processes of subordinate officials and finally to reduce them to a state of inocuous acquiesence in any and all directions from a superior source.

If changes in control and management of industrial companies are inseparable from modern tendencies—and they seem to be so—it would perhaps be well to adopt the policy that is followed in government departments, where, when political changes occur, the minister changes, but the deputy-minister, who is the technical director and the repository of observed facts and accumulated experience, remains.

The plans for the colliery development of today should have been laid many years ago, and the programme of development for twenty years to come should be prepared today. The technical direction of a large coalfield is best achieved by the scientific mind, the possessor of which is not necessarily the best executive; and to achieve the best results in any scientific field it is requisite that a competent mind should be concentrated over a long period of years, undisturbed by passing events. Only in this way is the ripened vision and the thorough understanding requisite to technical success acquired, and, when the time comes, passed along to others.

A mining company can possess no more valuable asset than an engineer who has grown up with the mining field, has steeped his mind in knowledge of its characteristics, and has had leisure to follow technical problems to their logical conclusion. The evolution of such an officer requires first, the selection of the proper man, and, secondly, his retirement from all ephemeral executive duties, and, thirdly, the concentration of years of thought and investigation on the problems of the field selected for a life's work.

Revival of Former System of District Superintendence.

The division of the colliery into superintendence districts was begun under Mr. G. H. Duggan's management and was continued until a few years ago when through death and resignations the district superintendents were reduced to two in number, namely Messrs. A. McEachern and A. Macdonald who were appointed assistants to the General Superintendent of Mines.

Pursuant to a circular issued by M. H. J. McCann, the Assistant General Manager of the Coal Company the collieries are again divided into districts, but three districts of four, as previously are designated.

No. 1 District, of which A. McEachern is appointed Superintendent, contains the collieries in the central Glace Bay district, namely, Nos. 1, 2 and 9, 5, 10, 11 and 24. In this district is included most of the land area of the Hub, Harbor, Phalen and Emery seams, and the as yet unworked land area of the lower seams. A new shaft is approaching completion between No. 1 and 8 collieries, and the operations in the three upper seams are all submarine. The area of the Phalen seam in No. 5 (Reserve) Colliery is approaching exhaustion and No. 10 and 11 collieries represent the workings on the underlying Emery seam in the Reserve area. No. 24 colliery is the latest opening on the Emery seam, and at some future period another Emery seam colliery will be opened to work the seam where it underlies the exhausted land workings of No. 1 and 2 collieries.

Mr. A. Macdonald is appointed Superintendent of collieries Nos. 4, 6, 21, 22 and 25. No. 4 is Caledonia Colliery, and it is anticipated that a new shaft will be sunk to work the submarine area of Phalen seam coal now being drawn to No. 4 Shaft. No. 6 is a Phalen-seam colliery, entirely submarine with a large tributary area still to be drawn from. Nos. 21 and 22 are mining a tongue-shaped land area of coal in the Morien Basin which proceeds seawards at the village of Morien, where the old Morien Colliery, (successively known as the Gowrie and Blockhouse and North Atlantic Collieries) is being re-opened and designated No. 25 Colliery.

The Collieries in the Lingan-Victoria Basin, (now known as the Waterford District) are Nos. 12, 14, 15, 16 and 17, and are placed under the superintendence of Mr. J. C. Nicholson. In this district several additional groups of collieries are projected upon the Lingan and Victoria seams, and at some future date the underlying seams, of which there are several, will be worked, An overlying seam, the Barrasois, is being tapped from the Victoria seam by cross-measure drifts proceeding from the existing collieries. The Barrasois, Victoria and Lingan seams in the Waterford district are recognised as the equivalents of the Hub, Harbor and Phalen seams in the Glace Bay district, but the correlation of these with the Morien seams is still a matter of conjecture, as is also the correlation of the Waterford Seams with those across the entrance to Sydney Harbor that have been extensively worked at Sydney Mines. Much interest attaches to the progress of the sinking of the deeps in No. 17 Colliery, Victoria Seam, as these are now aproaching the line of the disturbance that runs under Sydney Harbor.

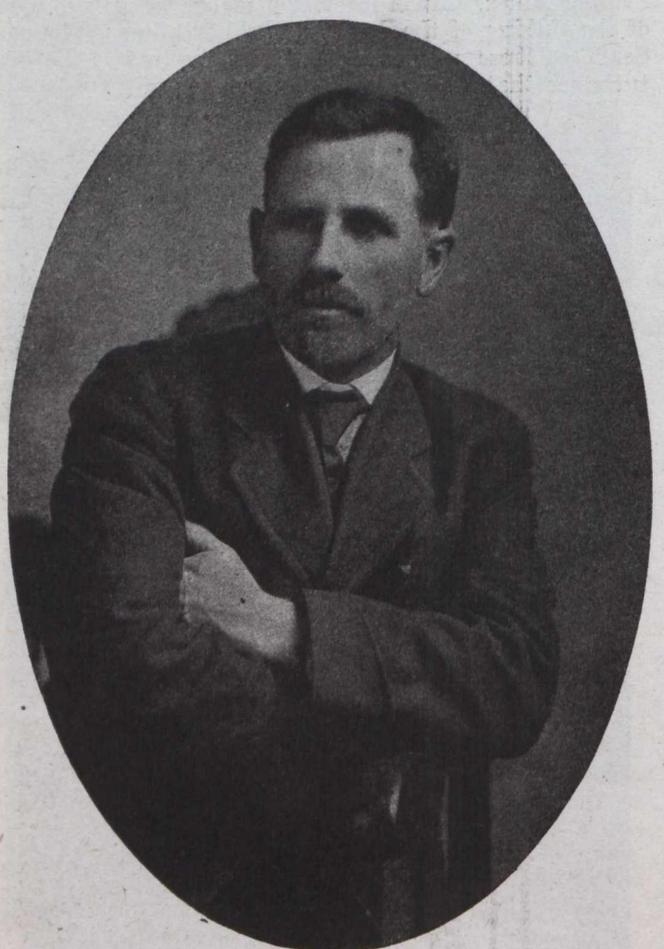
MR. ALEX. McEACHERN

Following the re-arrangement and revival of the district superintendence organization, other promotions have been given effect to. P. T. Prendergast formerly manager of Nos. 2 and 9 collieries is appointed Assistant District Superintendent in No. 1 District. D. J. McCuish is appointed manager of No. 2 Colliery, and W. S. McDonald becomes Assistant Manager. Mr. J. J. McNeil is appointed Manager of No. 9 Colliery, resigning his position as Deputy Inspector of Mine under the Provincial Government. Previously to taking a position on the inspectorate Mr. McNiell was Manager of the same colliery.

Vincent McFadden, who has for many years been the Electrical Engineer of the Dominion Company, and has since Mr. J. S. Whyte resigned the position of Mechanical Engineer to go with the Acadia Coal Company, also acted as Mechanical Engineer, has resigned and is succeeded by Maurice Murphy, Mechanical Superintendent of the Dominion Steel Company. Mr. Murphy has been with the Steel Company since it was commenced and has gradually risen in successive official positions connected with mechanical equipment.

Re-organization of Dominion Coal Police Department.

The police and watchmen employees of the Dominion Steel Corporation, which includes the Dominion Coal Company, are again placed under the direction of Capt. D. A. Noble. This appointment re-establishes a former arrangement. During the war period Capt. Noble was Registra and director of Aliens under the direction of the Ottawa authorities, and the absence of any unpleasantness in connection with large number of registered aliens in the Sydney District was in large measure due to Capt. Noble's careful handling of a delicate combination of circumstances.



MR. ALEX. MACDONALD

The Output Position of the Dominion Coal Company.

The disastrous effect of war upon production of the Dominion Coal Company in the Sydney field is shown by the following comparison of the daily average output of the collieries in the Summer of 1914 as compared with the daily average of production in May 1920. It will be seen that the daily average has been reduced from almost 20,000 tons to about 10,700 tons. The periodic daily maximum, which comes midway between paydays, is at the present time around 12,000 tons, comparing with 21,000 tons in 1914.

Mine Number	Seam	Daily Average Beginning 1914 Tons	Daily Average May 1920 Tons
1	Phalen	2,000	1,070
2	„	3,200	1,930
3	„	400	Exhausted
4	„	1,600	1,120
5	„	700	340
6	„	800	760
7	Hub	800	Closed
8	Harbor	250	Exhausted
9	„	1,600	930
10	Emery	800	410
11	„	400	580
12	Victoria	1,600	600
14	„	1,600	640
15	Lingan	1,000	460
16	„	1,300	490
17	Victoria	200	100
21	Birch Grove	700	500
22	„	600	600
24	Emery	....	120
25	Morien	....	....
		19,550	10,650

It will be seen from the foregoing that the development of No. 17, which was well advanced in 1914, was entirely arrested by the war.

During the war period three collieries were closed and conditions did not permit of replacement by new winnings. No. 24 Colliery is still in the initial stages of production, and No. 25 Colliery (Morien Colliery) is being unwatered preparatory to commencing mining operations.

METAL QUOTATIONS.

Fair prices for ingot metals at Montreal, 23rd June 1920.

	Per lb.—Per cent
Electro copper	24
Castings copper	23½
Zinc	10½
Lead	10
Tin	57
Antimony	11½
Aluminum	37

PERSONAL.

Prof. J. S. DeLury acting head of the Department of Geology, University of Manitoba, will spend several weeks in the Rice Lake gold area this summer for the Manitoba Government.

Sir John Cadman Defends British Oil Policy

An Attitude of Impartiality and Fairness.

Reading an important paper on "The Oil Resources of the British Empire" before the Indian and Colonial sections of the Royal Society of Arts recently, Professor Sir John Cadman, who has for a considerable time been acting as official advisor to the Government as principal permanent official of the Petroleum Executive, said there had been of late in regard to the British Empire and its oil policy some idea that we were attempting to dominate the supplies of this planet. The British Empire consisted of one-fifth of the surveyed land of the globe, and it was only natural that we should in some measure look after our citizens. On the one hand, there were groups of capitalists attempting, and rightly so, to secure concessions in new territories; on the other hand, the results of the great war has brought about a world shortage of oil. That commodity has been used to an extent never before known. As inevitably happened, when there was a shortage, the price had gone up, and there were some people who imagined that this could be corrected by price-limiting machinery. Such regulation, however, would result in focussing the shortage more acutely on those nations which adopted it.

Mesopotamia's Oil.

An outcry had arisen in the United States that Great Britain was attempting to "collar" the world's supply of oil and the people who were trying to secure territories at the moment were centering their activities on Mesopotamia. Now, it had been known for many years that oil existed in Mesopotamia. Indeed, it had been open to every comer, of no matter what nation, to prospect the oil territories of Mesopotamia, and to secure rights of exploitation. But at last Mesopotamia had come under the mandate of a stable Government, and it was wonderful how active people became in attempting to secure opportunities of working a territory when stable Government was going to keep law and order for these people to operate within such area. It was also wonderful that certain interests in America should wake up very readily to the possibilities of oil in those territories and rush into an attack upon those organizations which had tried to look after the supplies under the British flag.

As to the proportions in which oil supplies existed in various countries of the world today, Sir John Cadman said that the continent of North America produced over 85 per cent. of the world's output of crude oil. Of this the United States produced in her own territory nearly 70 per cent. If the quantity produced by the United States in Mexico was added, the total United States control in North America was at least 80 per cent. of the world's supply. The British Empire, however, produced only 2½ per cent. of the world's oil supply, or, if Persia might be said to be under British influence, about 4½ per cent. of the whole.

Future Supplies.

For the invaluable assistance we had received from the United States in the way of oil supplies in war and peace we could not fail to feel profoundly grateful. But the greatest producer of oil to-day was absorbing more and more of her own supply, and it behoved us to look around and see in the most friendly way where we were going to be served when the United States found it difficult to supply us, and we, too, were calling for more and more of this vital product.

Sir John proceeded to combat the statement that Great Britain was developing an oil policy which definitely excluded the foreigner from participating in and helping to develop any of the Empire's 2½ per cent. production to-day. In regard to Persia, the suggestion that Americans were under special disability in that country was absolutely incorrect. As the Anglo-Persian Oil Company held the concession, other British and foreign interests were naturally excluded, but there was no truth in the statement that the Anglo-Persian Oil Company's rights had been in any way strengthened by the Anglo-Persian agreement of 1918. The concession was acquired in 1910 through the individual enterprise of Mr. W. K. d'Arcy, and it was equally open to Americans or any other nations to secure it.

Result of British Enterprise.

Any oil concessions which British subjects held abroad had been acquired purely by individual enterprise, and they enjoyed no special advantage in the way of Government backing, nor did they wait to secure Government encouragement and support. On this difficult question he could only say that Great Britain was too sensible of what she owed to those who had kept her so well supplied in the past to adopt any attitude other than that of strict impartiality and fairness.

Mr. E. G. Pretyman, M.P., who presided, said that personally he rather though that, so far as the American oil magnates having any complaint against Great Britain, the boot was on the other foot, and the attitude of our Government and always been rather to leave our nationals, entirely unsupported, to their own resources, whereas other Governments had done their best to look after the interests of those who were trying to use their financial resources for the development of supplies outside of their own borders. His view was that, where private enterprise was acting entirely on its own, unsupported by the Government behind them, we ought not to interfere to give our own nations particular advantage over others, but where other nationals were being supported by their own Government then our nationals should receive similar support from our own Government.

NEW COLLIERY PROPOSED IN THE MORIEN BASIN, SYDNEY COALFIELD.

It is understood that Mr. Vincent Mc Fadden, formerly Electrical and Mechanical Engineer of the Dominion Coal Company, in conjunction with Mr. Cavvichi of Halifix, N.S. contemplates the opening of a colliery at False Bay Beach, on what are known as the General Montgomery Moore areas. The area covered by the Moore leases is entirely a land area and is underlain by the Tracy Seam, the lowest of the Sydney Coalfield series, and partially underlain by one or more of the seams above. The areas are situated on the fringe of the Morien Basin. The coal seams proceed to sea under slight cover, the abutting submarine leases being held by the Dominion Coal Company as the assigns of the Cumberland Coal and Railway Company.

PRESENT POSITION OF THE GOLD MINING INDUSTRY OF NORTHERN ONTARIO.

By J. A. McRae, Cobalt, Ontario.

The gold mining industry of Northern Ontario is growing at a rate far in excess of expectations, as shown in the official figures from the mines. The increase of 46 per cent. in production for the first quarter of this year as compared with that of the corresponding period last year so strengthened the position of the industry as to assure it of actually exceeding the sister industry, silver mining, for the first time since the discovery of silver in Cobalt.

While gold production promises to approximate around a million dollars a month for this year, it is interesting to note that producing gold mines report milling capacity of 5,485 tons daily. These figures taken together with the average grade of the ore treated, shows that present equipment is being utilized at only two-thirds capacity and that when operated at full blast should produce close to $18,000,000.

Ore is High Grade.

In arriving at the importance of such property, it may be well to keep in mind the fact that the average amount of gold recovered from each ton of ore treated was $9.19 for the past year, a figure which promises to be well maintained. The ore at the Lake Shore over $20 to the ton, at the Porcupine Crown runs about $11 to the ton, the McIntyre a little over $10 to the ton, the Hollinger $9.09 a ton and the Dome $6.50 to the ton. The other mines have ore approximating the above average.

The excellent physical condition of the mines as well as the comparatively favorable conditions under which they are developed enables them to operate at a favorable margin of net profits at a time when many gold mines in other parts of the world have been compelled to close down. This may reasonably be taken as an indication that with the return to conditions under which mines in other parts of the world may resume production, the mines of the Porcupine district will become doubly prosperous.

Output Steadily Increasing.

As evidence of the steady growth of the industry, the following figures may be presented, representing the production record during a period when some of the leading mines were operated at reduced capacity on account of a shortage of workmen as well as adverse economic conditions:—

Year	Ounces	Value
1910	3,089	$ 63,849
1911	2,062	42,625
1912	86,523	1,788,596
1913	219,801	4,543,690
1914	268,264	5,545,509
1915	406,577	8,404,693
1916	497,836	10,339,259
1917	420,894	8,698,881
1918	450,000	9,100,000
1919	505,963	10,451,688

While the above figures cover the output for the whole of the province of Ontario, more than 90 per cent., or close to $10,000,000 was Porcupine's share of the 1919 total.

As regards the present, current production from the mines of Porcupine has shown a considerable increase during the opening months of 1920, and the aggregate output is now close to $1,000,000 monthly.

The Future Outlook.

Concerning the future, with such a record as that above referred to established at a time when conditions were quite abnormally unfavorable, and at a time when all the mines operated at reduced capacity, the various operating companies may be permitted to anticipat a greatly increased record from this rate forward, all of which tends to offer every inducement for mining interests in other countries to turn their attention to Canada and especially Northern Ontario.

Big Virgin Field.

While the Porcupine field is the centre of Ontario's gold mining industry, and, in addition to its present proven mines with ore blocked out and in sight amounting to more than three score million dollars ahead of production, has a large outlying area which offers big scope for further exploration and much promise of additional mines being developed; it would be entirely misleading to conclude without making reference to the other parts of the district where commercial deposits of gold-bearing ore have been found. Chief among these might be mentioned the Kirkland Lake gold area, situated some 60 or 70 miles south-east from Porcupine, where current production for three mines now amounts to over $100,000 monthly, with a fourth mill ready to resume work in September and the construction of a fifth to be completed in the early Autumn. From these five mines it is calculated that a production at the rate of $2,500,000 a year will be established during the coming year.

The Newer Districts.

Other centres where considerable development work is being done with promise of success include: Boston Creek, Larder Lake, West Shiningtree, Fort Matachewan, Munro Township and Bourke's Siding.

Summarized, with the likelihood of the Porcupine mines producting at the rate of at least $12,500,000 by the end of this year, by which time the Kirkland Lake mines will be producing at the rate of approximately $2,500,000 a year, considerable added encouragement may reasonably be offered to those who would enter these as well as the newer areas in search of new mines.

DOME MINES ANNUAL MEETING.

The annual meeting of Domes Mines Company, Limited, was held in Toronto on Friday, when it was announced by J. S. Bache, the President, that the regular $1 dividend would be continued, and that any further payments would be on the account of repayment of capital. Speaking of the question of future dividends, the President said that it was recognized that the $1,000,000 which the company has today in cash and bonds, was all the working capital required and that repayment of capital in lieu of increased dividends was being considered. In regard to the operations of the past year it was stated that the progress made was remarkable when considered that only 250 men had been available instead of the 700 required. Answering the report given currency at the meeting that the gold mines of the Porcupine district might shut down, C. D. Kaeding, the general manager, said that unless labor quit, or their demands became higher than at present, there would be no shut-down of the Dome Mines. The regular dividend of $100,000 was declared by the directors previous to the annual meeting. A vote of confidence in the directors and H. P. De Pencier was passed and the former board of directors was re-elected.

Our Northern Ontario Letter

THE SILVER MINES.

Announcement from New York that the Pittman Bill has become operative, tends to strengthen silver quotations in all parts of the world. The bill provides that more than a quarter of a billion ounces are to be purchased at $1 an ounce or under. It also provides that such price is to be paid only for silver produced in the United States. Accordingly, quotations for the metal jumped from a low of 80 cents to 99½ cents an ounce during the third week of June, the quotation being in New York and for silver produced in advance to that point, yet a very marked increase occurred, and the indications appear to be that a minimum price approximating 99½ cents an ounce may rule for the next year or so, not only in the U. S., but in all parts of the world.

With a premium of around 15 per cent. on New York funds, the Canadian producers are receiving more in Canadian currency than the United States producers are receiving in the currency of that country.

Silver production is still stated to be far below consumption. In the period between April 1st and June 2nd, Great Britain exported more than $27,000,000 in silver to the Far East, while imports into Great Britain amounted to less than $11,000,000. During the corresponding period the silver stored in the national bank of Germany decreased to $182,200, or practically nil as of June 3rd, as compared with more than $3,000,000 as of May 20th. All these figures go to show that Europe is shooting a final bolt in the attempt to make permanent the break in silver prices. But, in the opinion of silver producers of the Cobalt district, this artificial scheme is bound to fail and the law of supply and demand is certain to prove immutable. It is for this reason that the recent price of 80 cents caused no very great alarm to the Cobalt miners.

A feature of this week in connection with the silver mining industry of Ontario is the increasing interest in the South Lorrain silver area. At the Keeley mine, now being operated by the Associated Gold Mines of West Australia, a medium tonnage of ore is said to have been opened up in the lower workings in that section of the property adjacent to the boundary of the Beaver Lake ground. This holding is also under option to the Associated Company. Good values are stated to have been encountered on the Beaver Lake side of the boundary. In the meantime the installation of milling equipment is proceeding.

Work of surveying the Haileybury Frontier property in South Lorrain has been carried out preparatory to resuming exploration work. It is stated that about $50,000 will be spent in further opening up this promising property which has lain idle for a number of years. It is situated close to the Keeley as well as the Wettlaufer Mines.

The address of the Associated Gold Mines of Western Australia, as well as that of the Haileybury Frontier Mines, is Haileybury, Ont.

Information from Gowganda continues to be encouraging. In addition to the leading operations, such as the Miller Lake-O'Brien and the Castle property of the Tretheway-Cobalt, quite a number of smaller operations are under way. Work in all directions in this district promises to take on added impetus provided the construction of the proposed light narrow-gauge railway is proceeded with this summer. In this connection, a bond issue of $300,000, 7 per cent., first mortgage ten-years, is being made by the Northern Light Railways Company. It is intimated that a part of the money may be subscribed by British interests already interested in mining in this part of Northern Ontario. The railway is to be 36-inch gauge, equipped with freight cars capable of handling 25 tons each, and passenger coaches with seating capacity for about 25 persons each.

A good deal of interest is now being shown in the possibility of finding crude oil in the northern part of the district of Temiskaming. The presence of oil shales at Long Rapids on the Abitibi River, an analysis of which was made by M. Y. Williams was well as J. Keele of the Geological Survey Branch, Ottawa, shows an encouraging crude oil content. The samples were taken from the exposed surface, and leads to the belief that if explored at a lower horizon the shales may be found to contain commercial deposits of oil.

Cobalt mining companies have been approached by would-be oil explorers, and considerable field work is expected to be undertaken within a reasonably short time, in the prospecting oil field. It is believed probable that one or more oil drilling outfits may be transported down river this summer so as to carry on exploration work during the coming winter. The distance from the railway is only a little over 100 miles.

THE GOLD MINES.

During the 5½ four-weekly periods from January 1st, to June 2nd, the Hollinger Consolidated Gold Mines had a total income of $2,879,706. This was at the rate of approximately $575,941 every month or at the rate of $6,911,292 a year. It compares with an income of $2,822,858 in the corresponding period of 1919. Not only does the report show a slight increase in income, but it also shows a decline in expenditure from $1,507,060 in the first five months of 1919 to $1,448,020 in the corresponding period of 1920. The average number of men employed amounted to 1,098 as compared with 1,259.

A special general meeting of the Porcupine V.N.T. Gold Mines has been called for July 14th for the purpose of considering and if approved, ratifying a plan to borrow $50,000 from the Associated Gold Mines of Western Australia against which a first mortgage would be given. This is believed to have been decided upon as a means of putting the mine and mill in shape for operation, following which the current production would provide for the necessary expenditure.

Intimation of encouraging development at the 10th level of the Dome Mines at the point where drifting has been extended onto the Dome Extension gave rise to renewed activity in the shares of the last named company. The Dome Mines holds an option on the Dome Extension which provides for the exchange of 30 shares of Dome Extension for one share of Dome Mines provided the latter company elects to exercise the option on or before October of this year.

The Dome Lake mine has been closed down indefinitely, and the underground workings are stated to be being allowed to flood. Economic conditions as well as labor shortage have militated against the profitable operation of the low-grade ore which has been found to occur only in patches. It is thought that at some future date, under more favorable conditions, the property can be re-opened, with possibilities of more satisfactory results.

It is stated at Kirkland Lake that although the Teck-Hughes Mine is now on a profitable producing basis, yet the earnings are not sufficiently large to retire the bond issue which comes due in October. As a consequence of this, a plan of reorganization is contemplated with increased capitalization to finance the retirement of the bonds. A meeting will be held some time in July to consider this matter.

At the Kirkland Lake mine of the Beaver Consolidated, production is stated to be at the rate of around $1,200 daily. This is the largest output achieved by this property. In the meantime, the main shaft is being extended from the 700 to the 900-ft. level, at which point a station should be cut early in July.

The King Kirkland Gold Mines, with head office at Kirkland Lake, Ont., and promoted by interests in Buffalo, has completed its organization of a $2,500,000 company, made up of 2,500,000 shares of the par value of $1 each. Of this, 1,250,000 shares are in the treasury to finance development work. Visible gold is in evidence on surface. The company owns seven mining claims situated in the central part of the township of Lebel.

At the Miller Independence Mines of Boston Creek, good headway is being made in cross-cut work at the 500-ft. level. A number of highly mineralized veins have been cut, and the work is approaching the zone in which it is expected to encounter the downward continuation of the rich ore body which was developed to a depth of 200 feet in an incline shaft. Considerable interest ataches to this important work, the result of which should be known before the end of July.

Work has been stopped on the property of the Matachewan Gold Mines, the reason given being that it has been decided to await the development of electric energy on the Montreal River. Diamond drill work carried on is said to have been quite favorable and such as to encourage aggressive operations just as soon as cheaper power is made available.

From present indications, five mines in the Kirkland Lake district will be producing gold before the end of the current year. An output at the rate of close to two and a half billion dolars annually is predicted.

At present the Lake Shore, Kirkland Lake and Teck-Hughes are treating an aggregate of close to 300 tons of ore daily, and producing at the rate of about $115,000 a month. With the Tough-Oakes mill to be pressed into service again in the late summer and with the mill of the Wright Hargreaves to be completed this fall, the daily tonnage should reach 600 tons and the monthly output should exceed $200,000.

Following is a preliminary estimate of what may be achieved as of the closing months of the current year:—

Company	Daily Capacity in Tons	Monthly production
Lake Shore Mines	60	$45,000
Wright-Hargreaves	180	45,000
Tough-Oakes	120	40,000
Kirkland Lake	130	38,000
Teck-Hughes	120	35,000
Totals	610	$203,000

The properties next in line are the Ontario-Kirkland and the Orr Gold Mines, the former of which has been developed to a depth of 450 feet and on which arrangements are even now being made to install a mill. The Orr Gold Mines has considerable gold in sight, but has been held in idleness, being involved with the Kirkland-Porphyry Company which has gone into voluntary liquidation because of trouble between the owning interests.

Other properties in the Kirkland Lake district which hold out big promise for the near future are the Bidgood Mines, Canadian-Kirkland, La Bell-Kirkland, etc.

This summarizes the properties in the Kirkland Lake gold area which are already on a producing basis or in an advanced stage of development. There are also a number of promising prospects about which the future will probably bring interesting news, with considerable liklihood of additional mines being developed from among them.

The Robb-Clemens claim, situated in Fort Matachewan, restaked recently due to failure of its owners to record the necessary assessment work, has been reyested in the names of the original holders, it having been found that the failure to record the work rested with Messrs. Norrington and Smith who had the claim under option, and who had performed a large amount of work, which they had forgotten to record.

At the Peerless Gold Mines, formerly the Mondeau property of Boston Creek, some good values are being encountered at a depth of 250 feet. Assays range from a few dollars to as high as $148 to the ton, the latter being across about four feet in width. While the average for the vein as so far opened up is far below the figure above given, yet a fair tonnage of good grade ore is stated to have been placed in sight.

Ore Shipments.

During the week ended June 17th, seven Cobalt companies shipped an aggregate of thirteen cars containing more than one million pounds of ore. The output was the heaviest for a good many weeks. The Nipissing alone shipped five cars containing approximately 447,241 pounds.

Following is a summary:—

Shipper	Cars	Pounds
Nipissing	5	447,241
Coniagas	2	173,797
Mining Corporation	2	130,301
La Rose	1	81,207
McKinley-Darragh	1	80,410
O'Brien	1	64,000
Dominion Reduction	1	64,000
Totals	13	1,040,956

During the corresponding period, no bullion was sent out, the reason for this being that the price of the metal slumped sharply about the middle of the week. Now, however, with quotations strengthened, shipments may soon be released.

Accompanying the current dividend cheque, an interim report on Hollinger Consolidated Gold Mines, has been sent out. The report covers the five and half four-weekly periods from January 1 to June 2 of this year. For the period covered by the report the total income was $2,879,706 compared with $2,822,858 in the same time last year. Total expenditure, including maintenance, showed slight reduction of $1,448,020, compared with $1,507,060. Net profits, therefore, were $1,431,685 against $1,315,798, or an increase of $115,000. Expenditure for plant was $83,363 compared with $75,079 and the dividends were unchanged at $738,000. The average tonnage per day showed a favorable production, reaching a total of 4056 against 3907.

BRITISH COLUMBIA LETTER.

The Metal Mines.

Alice Arm. B.C.

Lieut.-Col. S. R. Heakes, O.B.E., who prior to the war was the Manager for the Kerr Lake Mines, northern Ontario, is visiting the Alice Arm District. He is making an inspection of various mining properties of the section and will continue into the Portland Canal area before returning. His purpose is to obtain first-hand information regarding the mineral possibilities of different northern British Columbia camps on behalf of English clients. Col. Heakes asserts that English capital will be available to assist in the mineral development of this country as soon as the exchange situation rights itself.

The Toric Group of Mineral Claims, situated on the east side of the Kitsault River, are reported to have been bonded by John C. Pederson, one of the pioneers of the Alice Arm Camp. He obtained control from the original stakers and proposes commencing development this summer. It is understood that, in addition to further general exploration, diamond drilling is to be started.

Hearthley Boy.

The Drum Lummon Mine is keeping its mill, erected at tidewater, busy handling ore of good grade and it is reported that a considerable quantity of high grade ore is being sacked ready for shipment.

Cranbrook, B.C.

Mining men of Cranbrook are more than usually interested in the placer operations on Wild Horse and Perry Creeks. The Gamble Mining Co., whose holdings are on the former waterway, is said to have obtained good results already while on Perry Creek, where a local syndicate is preparing for work, the prospects are said to be quite as satisfactory.

Greenwood, B.C.

Duncan McIntosh, one of the lessees of the Bell Mine, Greenwood District, reports that the mine work is continuing as actively as the shortage of labor will permit. However the men available are working in ore averaging 175 ounces of silver, 8 per cent lead and about the same of zinc. About 1100 feet of driving and crosscutting has been done and several good leads are exposed, three of which are being worked.

Trail, B.C.

Two new shippers have joined the list of contributories to the Canadian Consolidated Mining and Smelting Company's smelter at Trail according to returns for the first week in June. They are the Mountain Chief, the Renata copper property which shipped 423 tons last year, and the Monarch, of Field, which shipped 190 tons in 1919. Ten properties shipped exclusive of the Company's proportion. Receipts for the week were 5353 tons, making the total for the year 124,979 tons.

The Consolidated Mining and Smelting Company has engaged Wm. Forrest of High River, Alberta, to take charge of the Company's several farms situated in the vicinity of the smelter at Trail. Mr. Forrest takes up his duties immediately. It is understood that at present most of the land will be seeded in alfalfa but eventually it is proposed that the farms will be well stocked and made to yield dairy as well as general farm products. This, it is presumed, is the Company's answer to complaints made in the past by independent farmers in the neighborhood of Trail that the smelter fumes made profitable farming out of the question.

The copper plant of the Consolidated Mining and Smelting Company is expected to resume operations about July 1st. Only one furnace is likely to be blown in at first, other units being added as the smelter feed increases. The converter, whose utility is the convertion of copper matte into blister, also will be started as well as the first division of the copper refinery. When the concentrating mill of the Can ada Copper Co., Copper Mountain, with its daily capacity of 2,000 tons of ore, begins contributing its concentrates the copper section of the Trail Smelter will be kept active as, in addition, it will have to take care of the product of both the Consolidated and of custom ores. The refinery, as enlarged, will be capable of producing daily some 100 tons of refined copper.

Work on the new copper rod mill, estimated to cost $250,000, is making satisfactory progress.

The magnetic test mill, operated for sometime on Sullivan Mine Ores in competition with the Sullivan flotation mill, has been closed down and is being dismantled. While this method of treatment was not altogether unsatisfactory it is not deemed as successful economically as the Company's improved flotation process in application to the particular ores in question.

Vancouver, B.C.

Charles E. Camsell, for several years in charge of the British Columbia Station of the Canadian Geological Survey, has been appointed Deputy Minister of Mines for Canada, succeeding R. G. McConnell, who has resigned.

Mr. McConnell, who is 63 years of age and a native of Quebec, has been associated with geological research work in Canada for many years. In 1879 he worked as assistant to the late Dr. G. M. Dawson in Western Canada. He has explored much in the north, having traversed the whole or large portions of the Stikine, Liard, Mackenzie, Porcupine, Lewis and Yukon rivers. He is the author of numerous reports and monographs, his "Geology of the Rossland Camp" being regarded as a text book.

In Mr. Camsell the Canadian Ministry has found a worthy successor to Mr. McConnell and his appointment is particularly popular from Western Canadian mining men by whom he is well-known and without exception highly respected. He is a product of the West, having been born at Fort Liard, where his father was Factor for the Hudson's Bay Company. After graduating from the University of Manitoba Mr. Camsell wandered over the wilds of the north country for six years. His adventures and experiences during that period are the subject of an interesting sketch in one of the recent issues of the Canadian Mining Institute Bulletin (see page 496, issue June 18th, 1920.) Subsequently he took post-graduate courses in geology at Queen's and Harvard Universities. There followed a few years of private professional work after which he became attached to the Canadian Geological Survey.

The operations of S. J. Marsh, of the Cariboo Gold, Platinum Extracting Co., headquarters at Quesnel, B.

C., are being watched with interest by the miners of the Cariboo, as well as by those interested in placer ground throughout the Province. Mr. Marsh announces that he is in the market for black sand such as is found along the Fraser, Tulameen, Thompson and other rivers of British Columbia. This contains values of varying importance in gold and platinum and it is Mr. Marsh's claim that he has invented, and demonstrated in a practical way, a device for the economic extraction of these precious metals from the sand. The Plant necessary to set in motion this electrochemical process, as it is termed is reported to have been assembled at Quesnel. Sixty days are set as the time needed to prepare for operation. Mr. Marsh in its request for black sand of the character indicated, undertakes to pay or to guarantee 90 per cent of the assay value of the same. It order to assure the continuous operation of the Quesnel Plant he is installing on the Quesnel River, some twenty-eight miles above the town a drag-seine dredge equipped with a concentrating device designed to separate the black sand from the gravel.

Victoria, B.C.

Henry S. Fleming, of New York, chairman of the Board of Directors of the Canadian Collieries (D) Ltd. has stated here that he proposes investigating the local conditions with a view to the establishment of an iron and steel industry. He proposes calling into consultation Hon. Wm. Sloan, Minister of Mines, and the mining engineers of the Provincial Bureau of Mines. That there is an adequate supply of magnetite, that there is no lack of fuel, and, in short, that everything needed for production is to be found in quantity in the Province is admitted by Mr. Fleming and the question to which he wishes to devote special attention is that of market. In this connection he said: "The whole thing narrows down to whether 325 tons of steel can be disposed of each day in this territory or produced at a cost that will permit of export. Our product will have to be manufactured into such products as billets, nails, wire fencing, etc. It is likely with the present high freight rates we will be able to hold our market here for such products. But my present problem is to find out just how much of these products this territory requires and can absorb."

Mr. Fleming also said that before a steel plant is built there will have to be assurances from the Provincial Government that there will be no eight-hour day restrictions or Sunday laws enforced.

The situation respecting the attitude of the men employed in the coal mines of the Province of Alberta was canvassed in the House of Parliament, Canada, recently when a mill proposing the continuance of the office of Director of Coal Operations, and the confirmation of certain orders of the said officer, was under consideration.

Answering strictures of Messrs. W .L. Mackenzie King and W. S. Fielding, leaders of the Opposition, who declared that by passing the measure the House would be declaring for the principle of the closed shop as far as as the mine in question were concerned. Hon. Arthur Meighen, Minister of Interior, dwelt on the situation existing when the orders were issued. The closed shop, he declared, was better than the frozen home. Coal had to be mined. Further the Bill did not perpetuate the orders but merely gave authority to the Director of Coal Operations, who would vary the orders if found necessary.

It should be explained that the orders in question have to do with the employment of adherents of the One Big Union and of the extreme principles for which that organization is said to stand.

Speaking as a member of the mining district under discussion W. A. Buchanan, of Lethbridge, Alberta, said that the effect of the activity of the Director of Coal Operations had been the promotion of harmony between the employed and employer. Since the appointment an adequate supply of coal had been available, the mines having been operated regularly. He did not think, however, that the director should be permitted dictate as to what Union's members should be permitted to work in the independent mines of the Province of Alberta and he asked whether his orders had this wide application.

Mr. Buchanan was assured that the Director of Coal Operators had never assumed such authority.

On the whole the Bill appears to have met with approval and there seems to be no doubt that it will be endorsed.

The aerial tram of the Lone Star Mine, Greenwood, B.C. District, is being dismantled for installation of the Coalmont Collieries. It is six miles in length and in good condition. It is to be used in the transport of coal from the pitmouth on the north fork of Granite Creek down the hill to the railway.

James Gray, superintendent of the Harvard Coal Co., operating at East Princeton, B.C., reports that the colliery plant has been augmented by a modern screening system and that screened coal is to be shipped to Vancouver City where a good market is assured. Work is in progress on two seams of coal, one six feet and the other nine feet in width.

Vancouver business men have acquired the coal lands formerly controlled by the South Nicola Coal Co., near Nicola, B.C., and proposed to proceed with its development.

George Wilkinson, General Superintendent o fthe Pacific Coast Coal Mines, Ltd., states that Samuel D. Wark has been appointed to re-open the Company's mine at Suquash, Vancouver Island. This mine has been inactive since 1914. Mr. Wark will unwater it, restore ventilation, and put it in shape for production

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The coal production for the month of May, as far as the figures are available at the time of writing, is as follows:—

VANCOUVER ISLAND.

Canadian Western Fuel Co., Nanaimo	52,193
Canadian Collieries (D) Ltd., Comox	29,167
Canadian Collieries (D) Ltd., South Wellington	6,889
Canadian Collieries (D) Ltd., Extension	14,175
Pacific Coast Coal Mines, Ltd.	7,793
Wellington Nanoose Collieries, Nanoose Bay	2,251
Granby Consolidated Mng. and Smltg Co., Cassidy	15,107
Total	127,575

NICOLA-PRINCETON.

Middlesboro Collieries	6,309
Fleming Coal Co.	2,633
Coalmont Collieries	539
Total	9,481

THE MINING AND RAILWAY ACTIVITIES OF THE LATE JAMES DUNSMUIR

(Abstracted from the Victoria "Colonist")

Although the Hon. James Dunsmuir carried on the undertakings connected with the family name since the death of his father in 1889, it was the late Robert Dunsmuir who inaugurated the great coal mining industry and amassed the nucleus of the big fortune which has descended to the present generation.

"What Lord Strathcona did for Canada on a large scale, the late Mr. Robert Dunsmuir accomplished for British Columbia," said one of his biographers some years ago. He was a Scotsman, and, possessed of the best traits of his countrymen, he applied these to the creation of large industries on a Vancouver Island. Coal mining and lumbering engaged his activities from the first, and he was the first man to take practical steps toward the opening up of this part of the Province when he built the line of railway connecting Victoria with the mines at Nanaimo. This involved no trifling expenditure, and the fact that he was prepared to make the financial venture indicated vast faith in the resources of this section of Canada.

The sailing vessel on which Mr. Robert Dunsmuir sailed from Scotland stranded at the mouth of the Columbia River while heading up the coast. The crew had heard of the discovery of gold in California, and deserted in a body. There was no alternative but for the passengers to go ashore. This was at Fort Vancouver, Washington, and while waiting for transportation to Victoria, Mrs. Dunsmuir, on July 8, 1851, presented her husband with a son. This was to be the Hon. James Dunsmuir, who inherited some of the best characteristics of his parents, being practical, hard-headed, thrifty, and endowed with a good fund of common sense. In later years he possessed the advantage of receiving direct instructions from the founder of the family fortunes, who was but twenty-six years of age when he emigrated from the Old Land, but who made his personality and aggressive business sense felt as soon as he landed on Vancouver Island. Mr. Robert Dunsmuir acted for many years as a mining expert at Nanaimo, in connection with the Vancouver Coal Company, which succeeded the Hudson's Bay Company. The famous Wellington mines were discovered by him in 1869, and from these developed the collieries which became known as the Wellington Colliery Company.

Started at Nanaimo

James Dunsmuir spent his early boyhood at Nanaimo. He was the first white baby that the Indians in that part of the Island had seen, and their curiosity and interest in the child on one occasion led to his disappearance. A search resulted in the discovery of the little boy in the possession of one of the local tribes.

He was educated first at Nanaimo, where his parents lived during the time that the father was engaged in the coal mining operations there, and later he went to Hamilton College, a military institute at Blackburg, Virginia, where he met the lady who afterwards became his wife. When he returned to Vancouver Island he at once joined his father in the management of the coal mining business, which was already assuming huge proportions. Here he gained experience which in later years proved of the greatest practical value, working down in the mines with the men who were digging coal. As time went on the management of the business passed more and more into his hands, and eventually he became excellently fitted to take his place as directing head of the great interests which involved coal mines, logging camps, steamships, etc.

Both his parents were endowed with forceful character. All the children in some degree inherited this, and in none of them was independence of judgment, initiative, willingness to work, desire to grasp the detail of business, more keenly apparent than in James Dunsmuir. He became intimately conversant with every department of the properties which came under his control, and even before his father's death his executive ability was very generally recognized throughout the Island, and, in fact, wherever the Dunsmuir interests reached.

The E. and N. Railway.

The construction of the E. & N. Railway was undertaken in 1882. The road was opened in 1886 from Victoria to Nanaimo, a subsidy of $750,000 cash being secured from the Dominion Government, and a land grant of two million acres being made by the Provincial Government The entire interests were acquired by the Hon. James Dunsmuir in 1902.

The Hon. James Dunsmuir, on the death of his father and brother, became the greatest landed and colliery proprietor in Western Canada, and one of its richest men. As a coalmining operator he was in his element; as a railway manager and landowner he did not feel at home, and this fact accounts for his business policy differing from the usual standards in such matters. Being a single-minded man and simple in his ambitions, having no desire to go beyond that which he understood, he devoted himself to the firm's collieries. The presidency of the railway was simply an inherited obligation, and he had no taste for it. The development of the Comox coal mines, the coke industry in connection therewith, the opening up and development of the Extension mines, the establishment of coal bunkers at Ladysmith, and the freight ferry from that point to Vancouver were all of his initiation, and carried out under his direct supervision.

As incidental to the Extension mine he laid out the townsite of Ladysmith, now a substantial town dependent largely, of course, upon the size of the payrolls at Extension and the smelter. It was at first contemplated to build the coal bunkers at Chemainus, to which point the ferry would have run, but there was some difficulty in adjusting the price to be paid for land for the site of the bunkers, and Mr. Dunsmuir went to Oyster Harbor instead, a decision characteristic of the man. The Alexander Colliery was closed down in a similar way—the result of a strike—and Mr. Dunsmuir never afterwards opened it.

Shortly after Mr. Dunsmuir's resignation of the office of Premier of British Columbia, he decided to dispose of the E. & N. Railway. He had received various offers in that connection, but he was a firm believer in the C.P.R., not only in respect of its ability to make a deal in a satisfactory manner, but also he realized the benefits to be derived from that corporation entering the field on the Island of Vancouver The first proposal was to sell the roadbed of the railway, and to retain the land grant and all its accessory rights, but it became apparent that the effect of separating the railway and the land grant was to subject the latter to taxation. Eventually the railway was purchased by the Canadian Pacific Railway,

minus the coal rights, fire-clay, etc., Mr Dunsmuir devoting himself exclusively to his other interests.

Early in 1910 he gave an option on his collieries and coal rights in the E &. N. Railway belt, and all business in connection therewith, for $11,000,000, which was acquired by Messrs. Mackenzie & Mann, railway promoters, and thus separated himself practically from all former business with which the Dunsmuir name had been prominently associated for such a long period of years.

MINERALS SEPARATION COMPANY.

Mr. H. L. Sulman Replies to Criticism.

The owners of the Minerals Separation process of oil flotation has experienced much difficulty in obtaining royalties from those who use the process. Many users of flotation consider that the Minerals Separation companies have attempted to collect royalties to which they are not entitled. There have been many processes used that the Minerals Separation company claims are infringments. The difference of opinion has been ventilated time and again in the courts. The endeavor to obtain royalties has naturally resulted in much fighting and the Mineral Separation companies have shown a tendency to fight hard and long for their rights. Some users of the process have had so much at stake that they also have gone to great expense to prove that the company is not entitled to such royalties.

Aside from the disputes over the validity of the patents, there has also been much criticism of the form of agreement required by the Minerals Separation companies from those who are willing to use the process on the company's terms. The Minerals Separation companies are for these and other reasons not receiving bouquets from the American technical press.

During the war the Minerals Separation North America Corporation received further undesirable notoriety, from the fact that its predecessor in America had as agents the German controlled firm of Beer, Sondheimer and Co. The association with this firm was not likely to increase the popularity of Minerals Separation companies.

However it would seem that the unpopularity of the company is to some extent due to parties interested in avoiding the claims for royalties. At times it seems that the criticisms are ill founded and much overdrawn.

It is therefore interesting to read what Mr. H. L. Sulman has to say in the May issue of the Mining Magazine with reference to some of the recent criticism.

Mr. Sulman deals at some length with the remarks published in American technical journals in reference to his contributions on the Minerals Separation process and his connection with the Minerals Separation companies. He states that he is not a large shareholder in the companies, but that he has been and now is consulting metallurgist and that those in control have nothing to fear from their detractors. Mr. Sulman evidently believes that much of the criticism is not impartial. He says "a small section of the American technical press apparently has motives for attacking the Corporation, seemingly with the object of creating a volume of hostile opinion designed to have what effect it may upon the interests of the corporation in matters still awaiting final decision in the United States Courts." —R.E.H.

CHANGES IN CANADIAN FAIRBANKS-MORSE ORGANISATION.

Mr. C. J. Brittain, formerly Managing-Director of the Winnipeg, Calgary and Saskatoon Branches of The Canadian Fairbanks-Morse Co., Limited, has been appointed Vice-President and General Sales Manager of that organization, with headquarters in Montreal. Mr. Brittain succeeds Mr. C. Graham Drinkwater, who has been Vice-President in charge of sales for many years, and who has resigned to join the banking firm of Aldred & Company, Limited.

Mr. Brittain brings to his new post a wide experience of many years and a splendid record of achievement. He was one of the first salesmen engaged by The Canadian Fairbanks-Morse Co., Limited in the early days of the company and he has made good in every position to which he has been appointed. He has the entire confidence and hearty support of all those who know him, both in the organization and as customers.

MR. C. J. BRITTAIN

Mr. Kenneth Forbes, who has been Manager of the St. John, N.B. Branch, goes to Winnipeg to assume charge of that Branch, together with that of the Regina Branch, which is under construction at the present.

Mr. Forbes is succeeded at St. John, N.B., by Mr. W. J. Hill. Other changes in the management of the Sales Department—all of which represent well-earned promotion and increased opportunity to assume greater responsibilities—are the appointments of Mr. Malcolm Cordell to be Montreal Manager, and Mr. George L. Nies and Mr. Archibald Turnbull, who will become Managers of the Calgary and Saskatoon Branches respectively, taking up a portion of the duties which formerly came under the direction of Mr. Brittain.

The funeral of the late J. F. Whitson, of the Northern Development branch of the Department of Forests and Mines, who died very suddenly of heart failure in Sudbury last Saturday, took place in Toronto on June 14th. The late Mr. Whitson was connected with the Ontario Government for thirty years, and was well-known throughout Northern Ontario. Previous to his appointment as Commissioner of Northern Development in 1902, he was Assistant Director of Surveys.

Mr. J. G. Ross of the Milton Hersey Company, Ltd., Montreal, is examining properties in the Western States.

POWER ROCK DRILLS SHOWN AT WORK ON SOUTH AMERICAN BANKNOTES.

(By F. A. McLEAN).

A representative of the Ingersoll-Rand Company who returned from a business trip to the West Coast of South America a few months ago brought back with him two interesting souvenirs in the form of Peruvian bank notes bearing on their reverse sides reproductions of rock drills of the type manufactured by this Company, as may be noted from the accompanying illustration, which is somewhat smaller than the original.

The banknotes were engraved for Peruvian bank customers by the American Banknote Company of New York, whose name appears in English near the bottom of the bills. The value of the Peruvian Libra in our money is nominally $4.86 2-3, the same as the English pound, although the present quotation in New York is about $4.30. As it is unlawful in most civilized countries to photograph or make any work of reproductions of currency, permission had to be obtained from the Peruvian Government before photographic copies of the notes could be made.

Mining is the most important source of national wealth in Peru, and the use of a rock-drill upon the country's bank notes as a symbol of the mining industry is interesting as showing how widespread is the standardization of this type of modern mining equipment.

MINING ENGINEER with broad experience in Mine Development and Examinations open for two months engagement. Prefer Northern Ontario. Address, Box 15, Canadian Mining Journal, Gardenvale, P. Q.

PROVINCE OF QUEBEC

MINES BRANCH

Department of Colonization, Mines and Fisheries

The chief minerals of the Province of Quebec are Asbestos, Chromite, Copper, Iron, Gold, Molybdenite, Phosphate, Mica, Graphite, Ornamental and Building Stone, Clays, etc.

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

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

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

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

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

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

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

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

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

The Bureau of Mines at Quebec will give all the information desired in connection with the mines and mineral resources of the Province, on application addressed to

HONOURABLE J. E. PERRAULT,
MINISTER OF COLONIZATION, MINES AND FISHERIES, QUEBEC.

BRITISH COLUMBIA

The Mineral Province of Western Canada

Has produced Minerals valued as follows: Placer Gold, $75,436,103; Lode Gold, $97,121,786; Silver, $46,839,631; Lead, $42,294,251; Copper, $145,741,069; Other Metals (Zinc, Iron, etc.), $13,278,058; Coal and Coke, $187,147,652; Building Stone, Brick, Cement, etc., $28,843,272; Miscellaneous Minerals, $651,759; making its mineral production to the end of 1918 show an

Aggregate Value of $637,353,581

The substantial progress of the Mining Industry of this Province is strikingly exhibited in the following figures, which show the value of production for successive five-year periods: For all years to 1895, inclusive. $94,547,241; for five years, 1896-1900, $57,605,967; for five years, 1901-1905, $96,509,968; for five years, 1906-1910, $125,534,474; for five years, 1911-1915, $142,072,603; for the year 1916, $42,290,462; for the year 1917, $37,010,392; for the year 1918, $41,782,474.

Production During last ten years, $313,976,022

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

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

Mineral locations are granted to discoverers for nominal fees.

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

Full information, together with Mining Reports and Maps, may be obtained gratis by addressing

THE HON. THE MINISTER OF MINES
VICTORIA, British Columbia

The Canadian Miners' Buying Directory.

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

A.C. Units:
MacGovern & Co.

Agitators:
The Dorr Co.

Air Hoists:
Canadian Ingersoll-Rand Co., Ltd.
Mussens, Limited.

Alloy and Carbon Tool Steel:
H. A. Drury Co., Ltd.
International High Speed Steel Co., Rockaway, N.J.

Alternators:
MacGovern & Co.

Spielman Agencies, Regd.

Aluminium:

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

Antimony:
Canada Metal Co.

Antimonial Lead:
Pennsylvania Smelting Co.

Arrester, Locomotive Spark:
Hendrick Manufacturing Co.

Arsenic White Lead:
Coniagas Reduction Co.

Assayers' and Chemists' Supplies:
Dominion Engineering & Inspe tion Co.
Lymans, Limited
Mine & Smelter Supply Co.
Pennsylvania Smelting Co.
Stanley, W. F. & Co., Ltd.

Ash Conveyors:
Canadian Link-Belt Company

Ashes Handling Machinery:
Canadian Mead-Morrison Co., Limited

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

Asbestos:
Everitt & Co.

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

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

Balances—Heusser:
Canadian Fairbanks-Morse Co., Ltd.
Mine and Smelter Supply Co.

Babbit Metals:
Canada Metal Co.
Canadian Fairbanks-Morse Co., Ltd.
Hoyt Metal Co.

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

Ball Mill Linings:
Hardinge Conical Mill Co.
Hull Iron & Steel Foundries, Ltd.

Belting—Leather, Rubber and Cotton:
Canadian Fairbanks-Morse Co., Ltd.
Link Belt Co.
The Mine & Smelter Supply Co.
Northern Canada Supply Co.
Jones & Glasco.

Belting:
R. T. Gilman & Co
Gutta Percha & Rubber, Ltd.

Belting—Silent Chain:
Hans Renold of Canada, Limited, Montreal, Que.
Jones & Glassco (Regd.)

Belting (Transmission):
Goodyear Tire & Rubber Co.

Belting (Elevator):
Goodyear Tire & Rubber Co.

Belting (Conveyor):
Goodyear Tire & Rubber Co.
Gutta Percha & Rubber, Ltd.

Blasting Batteries and Supplies:
Canadian Ingersoll-Rand Co., Ltd
Mussens, Ltd.
Northern Canada Supply Co.
Canadian Explosives, Ltd.
Giant Powder Co. of Canada, Ltd.

Bluestone:
The Consolidated Mining & Smelting Co.

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

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

Blue Vitriol (Coniagas Red):
Canadian Fairbanks-Morse Co., Ltd.

Bortz and Carbons:
Diamond Drill Carbon Co.

Boxes, Cable Junction:
Standard Underground Cable Co. of Canada, Ltd.
Northern Electric Co., Ltd.

Brazilian Rough Diamonds:
Diamond Drill Carbon Co.

Brazilian Mica:
Diamond Drill Carbon Co.

Buggies, Mine Car (Steel)
Hendrick Manufacturing Co.

Brazilian Ballas:
Diamond Drill Carbon Co.

Brazilian Rock Crystal:
Diamond Drill Carbon Co.

Brazilian Tourmalines:
Diamond Drill Carbon Co.

Brazilian Aquamarines:
Diamond Drill Carbon Co.

Bridges—Man Trolley and Rope Operated—Material Handling:
Canadian Mead-Morrison Co., Limited

Bronze, Manganese, Perforated and Plain:
Hendrick Manufacturing Co.

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

Buckets, Elevator:
Hendrick Mfg. Co.

Cable—Aerial and Underground:
Northern Canada Supply Co.
Standard Underground Cable Co. of Canada, Ltd.

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

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

Canadian Miners' Buying Directory.—(Continued)

Cables—Wire:
Standard Underground Cable Co. of Canada, Ltd.
Canada Wire & Cable Co.
Fraser & Chalmers of Canada, Ltd.
Northern Electric Co., Ltd.
Osborn, Sam'l (Canada) Limited.
R. T. Gilman & Co.

Cable Railway Systems:
Canadian Mead-Morrison Co., Limited.

Cam Shafts:
Canada Foundries & Forgings, Ltd.
Hull Iron & Steel Foundries, Ltd.

Car Dumps:
Sullivan Machinery Co.
R. T Gilman & Co.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.

Carbide of Calcium:
Canada Carbide Company, Ltd.

Cars:
Canadian Foundries and Forgings, Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
John J. Gartshore
MacKinnon Steel Co., Ltd.
The Electric Steel & Metals Co.
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.
Marsh Engineering Works
Mine and Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
R. T. Gilman & Co.
The Wabi Iron Works

Car Wheels and Axles:
Canadian Car Foundry Co., Ltd.
Burnett & Crampton
Hull Iron & Steel Foundries, Ltd
John J. Gartshore
Marsh Engineering Works, Ltd.
Osborn, Sam'l (Canada) Limited.
The Electric Steel & Metals Co.
The Wabi Iron Works

Carriers (Gravity):
Jones & Glassco

Castings—Brass
The Canada Metal Co., Ltd.

Castings (Iron and Steel)
Burnett & Crampton
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
Osborn, Sam'l (Canada) Limited.
The Electric Steel & Metals Co.
The Wabi Iron Works

Cement and Concrete Waterproofing:
Spielman Agencies, Regd.

Cement Machinery:
Northern Canada Supply Co.
Hadfields, Limited
Hull Iron & Steel Foundries, Ltd.
Osborn, Sam'l (Canada) Limited.
Fraser & Chalmers of Canada, Ltd.
Canadian Fairbanks-Morse Co., Ltd
The Electric Steel & Metals Co.
R. T Gilman & Co.
Burnett & Crampton

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

Chain Drives:
Jones & Glassco (Regd.)

Chain Drives—Silent and Steel Roller:
Hans Renold of Canada, Limited, Montreal, Que.

Chemical Apparatus:
Mine and Smelter Supply Co.

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

Chrome Ore:
The Electric Steel & Metals Co
Everett & Co.

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

Clutches:
Hans Renold of Canada, Limited, Montreal, Que.

Coal:
Dominoion Coal Co.
Nova Scotia Steel & Coal Co

Coal Cutters:
Osborn, Sam'l (Canada) Limited.
Sullivan Machinery Co.
Canadian Ingersoll-Rand Co., Ltd

Coal Crushers:
Canadian Mead-Morrison Co., Limited

Coal Mining Explosives:
Canadian Explosives, Ltd
Giant Powder Company of Canada, Ltd.

Coal Mining Machinery:
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Osborn, Sam'l (Canada) Limited.
Canadian Ingersoll-Rand Co., Ltd.
Sullivan Machinery Co.
Marsh Engineering Works
Hadfields, Ltd.
Hendrick Mfg. Co.
Fraser & Chalmers of Canada, Limited
Mussens, Limited
R. T. Gilman & Co.

Coal and Coke Handling Machinery
Canadian Mead-Morrison Co., Limited.
Link-Belt Co.

Coal Pockets:
Canadian Mead-Morrison Co., Limited.

Coal Pick Machines:
Sullivan Machinery Co.

Coal Screening Plants:
Canadian Mead-Morrison Co., Limited.

Cobalt Oxide:
Coniagas Reduction Co.
Everitt & Co.

Compressors—Air:
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Canadian Ingersoll-Rand Co., Ltd.
Northern Canada Supply Co.
MacGovern & Co., Inc.
R. T. Gilman & Co.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
The Mine & Smelter Supply Co.

Concrete Mixers:
Canadian Fairbanks-Morse Co., Ltd.
Northern Canada Supply Co.
Gould, Shapley & Muir Co., Ltd.
MacGovern & Co. Inc
Mussens, Limited
R. T. Gilman & Co.

Condensers:
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Northern Canada Supply Co.
MacGovern & Co., Inc.

Concentrating Tables:
The Mine & Smelter Supply Co.
Deister Concentrator Co.
The Wabi Iron Works

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

Conveyors—McCaslin Gravity Bucket:
Canadian Mead-Morrison Co., Limited.

Contractors' Supplies:
Canadian Fairbanks-Morse Co., Ltd

Consulters and Engineers:
Hersey Milton Co., Ltd

Conveyors:
The Mine & Smelter Supply Co.
Jones & Glassco (Regd.)

Conveyor Belts:
Gutta Percha & Rubber, Ltd.

Conveyor Flights:
Hendrick Mfg. Co., Ltd.

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

Conical Mills:
Hardinge Conical Mill Co.

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

Couplings:
Hans Renold of Canada, Limited, Montreal, Que.

Cranes:
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Limited.
Canadian Link-Belt Company
R. T. Gilman & Co.
Smart-Turner Machine Co.

Crane Ropes:
Allan Whyte & Co.
Greening, B., Wire Co., Ltd.

Crucibles:
Canadian Fairbanks-Morse Co., Ltd.
The Mine & Smelter Supply Co.

Crusher Balls:
Canada Foundries & Forgings, Ltd.
Hull Iron & Steel Foundries, Limited, Hull, Que
Osborn, Sam'l (Canada) Limited.

Crude Oil Engines:
Swedish Steel & Importing Co., Ltd.

Crushers:
Canadian Fairbanks-Morse Co., Ltd.
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
Hardinge Conical Mill Co.
Osborn, Sam'l (Canada) Limited.
The Electric Steel & Metals Co., Ltd.
R. T. Gilman & Co.
Lymans, Ltd.
Mussens, Limited
The Mine & Smelter Supply Co.
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd
The Wabi Iron Works

Canadian Miners' Buying Directory.—(Continued)

Cut Gears:
Hans Renold of Canada, Limited, Montreal, Que.

Cyanide:
American Cyanamid Company.

Cyanide Plant Equipment:
The Dorr Co.
The Mine & Smelter Supply Co.

D. C. Units:
MacGovern Co.

Derricks:
Smart-Turner Machine Co.
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
R. T. Gilman & Co.
Canadian Fairbanks-Morse Co., Ltd.
Mussens, Limited

Diamond Drill Contractors:
Diamond Drill Contracting Co.
E. J. Longyear Company
Smith & Travers
Sullivan Machinery Co.

Diamond Tools:
Diamond Drill Carbon Co.

Diamond Importers:
Diamond Drill Carbon Co.

Digesters:
Canadian Chicago Bridge and Iron Works

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

Dredger Pins:
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
The Electric Steel & Metals Co.
Hadfields, Limited

Dredging Machinery:
Canadian Steel Foundries, Ltd.
Canadian Mead-Morrison Co., Limited.
Hadfields, Limited
Hull Iron & Steel Foundries, Ltd.
R. T. Gilman & Co.

Dredging Ropes:
Allan, Whyte & Co.
Greening, B., Wire Co., Ltd.
R. T. Gilman & Co.

Drills, Air and Hammer:
Canadian Ingersoll-Rand Co., Ltd.
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Sullivan Machinery Co.
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.
The Mine & Smelter Supply Co.
Mussens, Limited

Drills—Core:
Canadian Ingersoll-Rand Co., Ltd.
E. J. Longyear Company
Standard Diamond Drill Co.
Sullivan Machinery Co.

Drills—Diamond:
Sullivan Machinery Co.
Northern Canada Supply Co.
E. J. Longyear Company

Drill Steel—Mining:
H. A. Drury Co., Ltd.
Hadfields, Limited
International High Speed Steel Co., Rockaway
Osborn, Sam'l (Canada) Limited.
Mussens, Limited
Swedish Steel & Importing Co., Ltd.

Drill Steel Sharpeners:
Canadian Ingersoll-Rand Co., Ltd.
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Northern Canada Supply Co.
Sullivan Machinery Co.
Osborn, Sam'l (Canada) Limited.
The Wabi Iron Works

Drills—Electric:
Canadian Fairbanks-Morse Co., Ltd.
Sullivan Machinery Co.
Northern Electric Co., Ltd.

Drills—High Speed and Carbon:
Canadian Fairbanks-Morse Co., Ltd.
Osborn, Sam'l (Canada) Limited.
H. A. Drury Co., Ltd.
Hadfields, Limited

Dynamite:
Canadian Explosives
Giant Powder Company of Canada, Ltd.
Northern Canada Supply Co.

Dynamos:
Canadian Fairbanks-Morse Co., Ltd.
MacGovern & Company

Ejectors:
Canadian Fairbanks-Morse Co. Ltd
Canadian Ingersoll-Rand Co., Ltd
Northern Canada Supply Co

Elevators:
Canadian Mead-Morrison Co., Limited.
Sullivan Machinery Co.
Northern Canada Supply Co.
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd.
Jones & Glassco (Regd.)
Mussens, Limited
The Wabi Iron Works

Engineering Instruments:
C. L. Berger & Sons

Engines—Automatic:
Canadian Fairbanks-Morse Co., Ltd
Canadian Mead-Morrison Co., Limited.
Fraser & Chalmers of Canada, Ltd.

Engines—Gas and Gasoline:
Canadian Fairbanks-Morse Co., Ltd.
Alex. Fleck
Fraser & Chalmers of Canada, Ltd
Osborn, Sam'l (Canada) Limited.
Sullivan Machinery Co.
Gould, Shapley & Muir Co., Ltd.
MacGovern & Co., Inc.
The Mine & Smelter Supply Co

Engines—Haulage:
Canadian Ingersoll-Rand Co., Ltd., Montreal, Que.
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
Fraser & Chalmers of Canada, Ltd.

Engines—Marine:
Canadian Fairbanks-Morse Co., Ltd.
MacGovern & Co., Inc.
Swedish Steel & Importing Co., Ltd.

Engines—Steam:
Canadian Fairbanks-Morse Co., Ltd
Canadian Mead-Morrison Co., Limited.
R. T. Gilman & Co.
MacGovern & Co., Inc.
Fraser & Chalmers of Canada, Ltd.

Engines—Stationery:
Swedish Steel & Importing Co., Ltd.

Engineers:
General Engineering Co., New York
The Dorr Co.

Ferro-Alloys (all Classes):
Everitt & Co.

Feed Water Heaters:
MacGovern & Co.

Fire Fighting Supplies:
Gutta Percha & Rubber, Ltd.

Flashlights—Electric:
Spielman Agencies, Regd.

Flood Lamps:
Northern Electric Co., Ltd.

Flourspar:
The Consolidated Mining & Smelting Co.
Everitt & Co.

Forges:
Canadian Fairbanks-Morse Co., Ltd.
Northern Canada Supply Co.

Forging:
Canadian Mead-Morrison Co., Limited.
Canadian Foundries and Forgings, Ltd.
Hull Iron & Steel Foundries, Ltd.
Smart-Turner Machine Co.
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd.

Frogs:
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
John J. Gartshore

Frequency Changers:
MacGovern & Co., Inc.

Furnaces—Assay:
Canadian Fairbanks-Morse Co., Ltd.
Lymans, Limited
Mine & Smelter Supply Co.

Fuse:
Canadian Explosives
Giant Powder Company of Canada, Ltd.
Northern Canada Supply Co.

Gaskets:
Gutta Percha & Rubber, Ltd.

Gears:
Hans Renold of Canada, Limited, Montreal, Que.
Jones & Glassco (Regd.)

Gears (Cast):
Hull Iron & Steel Foundries, Ltd.
The Link-Belt Co.

Gears, Machine Cut:
Canadian Fairbanks-Morse Co., Ltd.
Canadian Steel Foundries, Ltd.
The Electric Steel & Metals Co.
The Hamilton Gear & Machine Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Granulators:
Hardinge Conical Mill Co.

Grinding Wheels:
Canadian Fairbanks-Morse Co., Ltd.

Gold Refiners
Goldsmith Bros

Canadian Miners' Buying Directory.—(Continued)

Gold Trays:
Canada Chicago Bridge & Iron Works

Hose (Air Drill):
Goodyear Tire & Rubber Co.
Gutta Percha & Rubber, Ltd.

Hose (Fire):
Goodyear Tire & Rubber Co.
Gutta Percha & Rubber, Ltd.

Hose (Packings)
Goodyear Tire & Rubber Co.
Gutta Percha & Rubber, Ltd.

Hose (Suction):
Goodyear Tire & Rubber Co.
Gutta Percha & Rubber, Ltd.

Hose (Steam):
Goodyear Tire & Rubber Co.
Gutta Percha & Rubber, Ltd.

Hose (Water):
Goodyear Tire & Rubber Co.
Gutta Percha & Rubber, Ltd.

Hammer Rock Drills:
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Osborn, Sam'l (Canada) Limited.
Mussens, Limited
The Mine & Smelter Supply Co.

Hangers and Cable:
Standard Underground Cable Co. of Canada, Ltd.

High Speed Steel:
Canadian Fairbanks-Morse Co Ltd
H. A. Drury Co., Ltd.
Osborn, Sam'l (Canada) Limited.
Hadfields, Limited
International High Speed Steel Co., Rockaway

High Speed Steel Twist Drills:
Canadian Fairbanks-Morse Co., Ltd
H. A. Drury Co., Ltd.
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.

Hoists—Air, Electric and Steam:
Canadian Ingersoll-Rand Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd
Jones & Glassco
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
Northern Canada Supply Co.
Mine & Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works
R. T. Gilman & Co.
Mussens, Limited
Link-Belt Co.

Hoisting Engines:
Canadian Fairbanks-Morse Co., Ltd.
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
The Electric Steel & Metals Co
Mussens, Limited
Sullivan Machinery Co.
Canadian Ingersoll-Rand Co., Ltd.
Canadian Mead-Morrison Co., Limited.
Marsh Engineering Works
Fraser & Chalmers of Canada, Ltd.
The Mine & Smelter Supply Co.

Hoisting Towers:
Canadian Mead-Morrison Co., Limited.

Hose:
Canadian Fairbanks-Morse Co., Ltd.
Gutta Percha & Rubber, Ltd
Northern Canada Supply Co

Hose (Steam, Air, Water):
Gutta Percha & Rubber, Ltd.

Hydraulic Machinery:
Canadian Fairbanks-Morse Co., Ltd.
Hadfields, Limited
MacGovern & Co., Inc.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Industrial Chemists:
Hersey, M. & Co., Ltd.

Ingot Copper:
Canada Metal Co., Ltd.
Hoyt Metal Co.

Insulating Compounds:
Standard Underground Cable Co. of Canada, Ltd.

Inspection and Testing:
Dominion Engineering & Inspection Co.

Inspectors:
Hersey, M. & Co., Ltd.

Jacks:
Canadian Fairbanks-Morse Co., Ltd.
Can. Brakeshoe Co., Ltd.
Northern Canada Supply Co.
R. T. Gilman & Co.
Mussens, Limited

Jack Screws:
Canadian Foundries and Forgings, Ltd.

Laboratory Machinery:
Mine & Smelter Supply Co.

Lamps—Acetylene:
Dewar Manufacturing Co., Inc.

Lamps—Carbide:
Dewar Manufacturing Co., Inc.

Lamps—Miners:
Canada Carbide Company, Limited
Canadian Fairbanks-Morse Co., Ltd.
Dewar Manufacturing Co., Inc.
Northern Electric Co., Ltd.
Mussens, Limited

Lamps:
Dewar Manufacturing Co., Inc.

Lanterns—Electric:
Spielman Agencies, Regd.

Lead (Pig):
The Canada Metal Co., Ltd.
Consolidated Mining & Smelting Co

Levels:
C. L. Berger & Sons

Locomotives (Steam, Compressed Air and Storage Steam:
Canadian Fairbanks-Morse Co., Ltd.
H. K. Porter Company
R T. Gilman & Co
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited

Link Belt
Canadian Fairbanks-Morse Co. Ltd
Northern Canada Supply Co.
Jones & Glassco

Machinists:
Burnett & Crampton

Machinery—Repair Shop:
Canadian Fairbanks-Morse Co., Ltd.

Machine Shop Supplies:
Canadian Fairbanks-Morse Co., Ltd

Magnesium Metal:
Everitt & Co.
Hull Iron & Steel Foundries, Ltd.

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

Metal Marking Machinery:
Canadian Fairbanks-Morse Co., Ltd.

Metal Merchants:
Henry Bath & Son
Geo. G. Blackwell, Sons & Co.
Coniagas Reduction Co.
Consolidated Mining & Smelting Co. of Canada
Canada Metal Co.
C. L. Constant Co.
Everitt & Co

Metallurgical Engineers:
General Engineering Co., New York
The Dorr Co.

Metallurgical Machinery:
General Engineering Co., New York
The Dorr Co.
The Mine & Smelter Supply Co.

Metal Work, Heavy Plates:
Canada Chicago Bridge & Iron Works

Mica:
Everitt & Co.
Diamond Drill Carbon Co

Mining Engineers:
Hersey, M. Co., Ltd.

Mining Drill Steel:
H. A. Drury Co., Ltd.
Osborn, Sam'l (Canada) Limited.
International High Speed Steel Co., Rockaway, N

Mining Requisites:
Canadian Steel Foundries, Ltd.
Dominion Wire Rope Co., Ltd.
Hadfields, Limited
Osborn, Sam'l (Canada) Limited.
Hull Iron & Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd
The Electric Steel & Metals Co.
The Wabi Iron Works

Mining Ropes:
Dominion Wire Rope Co., Ltd.

Mine Surveying Instruments:
C. L. Berger & Sons

Molybdenite:
Everitt & Co.

Monel Metal (Wire, Rod, Sheet and Foundry Metal):
International Nickel Co.

Motors:
Canadian Fairbanks-Morse Co., Ltd
R. T. Gilman & Co.
MacGovern & Co.
The Mine & Smelter Supply Co.
The Wabi Iron Works

Canadian Miners' Buying Directory.—(Continued)

Motor Generator Sets—A.C. and D.C.
MacGovern & Co.

Nails:
Canada Metal Co.

Nickel:
International Nickel Co.
Coniagas Reduction Co.
The Mond Nickel Co., Ltd.

Nickel Anodes:
The Mond Nickel Co., Ltd.

Nickel Salts:
The Mond Nickel Co., Ltd.

Nickel Sheets:
The International Nickel Co. of Canada
The Mond Nickel Co., Ltd.

Nickel Wire:
The Mond Nickel Co., Ltd
The International Nickel Co. of Canada

Oil Analysts:
Constant, C. L. Co.

Ore Handling Equipment:
Canadian Mead-Morrison Co., Limited.

Ore Sacks:
Northern Canada Supply Co.

Ore Testing Works:
Ledoux & Co.
Can. Laboratories
Milton Hersey Co.
Campbell & Deyell
General Engineering Co., New York
Hoyt Metal Co.

Ores and Metals—Buyers and Sellers of:
C. L. Constant Co.
Geo. G. Blackwell
Consolidated Mining and Smelting Co. of Canada
Oxford Copper Co.
Canada Metal Co.
Hoyt Metal Co.
Everitt & Co.
Pennsylvania Smelting Co

Packing:
Canadian Fairbanks-Morse Co., Ltd.
Gutta Percha & Rubber, Ltd.

Paints—Special:
Spielman Agencies, Regd.

Perforated Metals:
Northern Canada Supply Co.
Hendrick Mfg. Co.
Canada Wire and Iron Goods Company.
Greening, B., Wire Co.

Permissible Explosives:
Giant Powder Company of Canada, Ltd.

Pig Tin:
Canada Metal Co., Ltd.
Hoyt Metal Co.

Pig Lead:
Canada Metal Co., Ltd.
Hoyt Metal Co.
Pennsylvania Manufacturing Co.

Pillow Blocks:
Canadian Link-Belt Company

Pipes:
Canadian Fairbanks-Morse Co., Ltd.
Canada Metal Co., Ltd.
Consolidated M. & S. Co.
Northern Canada Supply Co.
R. T. Gilman & Co.

Pipe Fittings:
Canadian Fairbanks-Morse Co., Ltd.

Pipe—Wood Stave:
Pacific Coast Pipe Co.
Mine & Smelter Supply Co.

Piston Rock Drills:
Mussens, Limited
Mine & Smelter Supply Co.

Plate Works:
John Inglis Co., Ltd.
Hendrick Mfg. Co.
The Wabi Iron Works
MacKinnon Steel Co., Ltd.

Platinum Refiners:
Goldsmith Bros.

Pneumatic Tools:
Canadian Ingersoll-Rand Co., Ltd
R. T. Gilman & Co.

Powder:
Giant Powder Company of Canada, Ltd.

Prospecting Mills and Machinery:
The Electric Steel & Metals Co
E. J. Longyear Company
Standard Diamond Drill Co.
Mine & Smelter Supply Co.
Fraser & Chalmers of Canada, L
The Wabi Iron Works

Pumps—Pneumatic:
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Sullivan Machinery Co.

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

Pumps—Turbine:
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
Canadian Ingersoll-Rand Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Pumps—Vacuum:
Canadian Fairbanks-Morse Co., Ltd.
Smart-Turner Machine Co.
The Wabi Iron Works

Pumps—Valves:
Canadian Fairbanks-Morse Co., Ltd.

Pulleys, Shaftings and Hangings:
Northern Canada Supply Co.
Canadian Fairbanks-Morse Co., Ltd
The Wabi Iron Works

Pulverizers—Laboratory:
Mine & Smelter Supply Co.
The Wabi Iron Works
Hardinge Conical Mill Co.

Pumps—Boiler Feed:
Smart-Turner Machine Co.
Northern Canada Supply Co.
Canadian Fairbanks-Morse Co., Ltd
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
Mine & Smelter Supply Co.

Pumps—Centrifugal:
Canadian Fairbanks-Morse Co., Ltd.
The Electric Steel & Metals Co.
Smart-Turner Machine Co.
Canadian Mead-Morrison Co., Limited.
Canadian Ingersoll-Rand Co., Ltd.
Mine & Smelter Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works

Pumps—Diaphragm
The Dorr Company

Pumps—Electric
Canadian Fairbanks-Morse Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
Mussens, Limited
Smart-Turner Machine Co.

Pumps—Sand and Slime:
Canadian Fairbanks-Morse Co., Ltd.
Fraser & Chalmers of Canada, Ltd.
Mine & Smelter Supply Co.
The Electric Steel & Metals Co.
The Wabi Iron Works
Smart-Turner Machine Co.

Quarrying Machinery:
Canadian Rock Drill Co.
Denver Rock Drill Mfg. Co., Ltd.
Sullivan Machinery Co.
Canadian Ingersoll-Rand Co., Ltd.
Hadfields, Limited
Mussens, Limited
R. T. Gilman Co.

Rails:
Hadfields, Limited
John J. Gartshore
R. T. Gilman & Co.
Mussens, Limited

Railway Supplies:
Canadian Fairbanks-Morse Co., Ltd.

Refiners:
Goldsmith Bros.

Riddles:
Hendrick Mfg. Co.

Roller Chain:
Hans Renold of Canada, Limited, Montreal, Que.

Roofing:
Canadian Fairbanks-Morse Co., Ltd
Northern Canada Supply Co.

Rope—Manilla:
Osborn, Sam'l (Canada) Limited.
Mussens, Limited

Rope—Manilla and Jute:
Jones & Glassco
Northern Canada Supply Co.
Osborn, Sam'l (Canada) Limited.
Allan, Whyte & Co.

Canadian Miners' Buying Directory.—(Continued)

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

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

Samplers:
Fraser & Chalmers of Canada, Ltd
C. L. Constant Co.
Ledoux & Co.
Milton Hersey Co.
Thos. Heyes & Son
Mine & Smelter Supply Co.
Mussens, Limited

Scales—(all kinds):
Canadian Fairbanks-Morse Co., Ltd.

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

Screens—Cross Patent Flanged Lip:
Hendrick Mfg. Co.

Screens—Perforated Metal:
Hendrick Mfg. Co.

Screens—Shaking:
Hendrick Mfg. Co.

Screens—Revolving:
Hendrick Mfg. Co.

Scheelite:
Everitt & Co.

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

Shaft Contractors:
Hendrick Mfg. Co.

Sheet Metal Work:
Hendrick Mfg. Co.

Sheets—Genuine Manganese Bronze:
Hendrick Mfg. Co.

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

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

Ship Bunkering Equipment:
Canadian Mead-Morrison Co., Limited.

Silent Chain:
Hans Renold of Canada, Limited, Montreal, Que.

Silent and Steel Roller:
Jones & Glassco (Regd.)

Siline:
Coniagas Reduction Co

Saline Refiners:
Goldsmith Bros.

Smelters:
Goldsmith Bros.

Sledges:
Canada Foundries & Forgings, Ltd.

Smoke Stacks:
Hendrick Mfg. Co.
MacKinnon Steel Co., Ltd
Marsh Engineering Works
The Wabi Iron Works

Special Machinery:
John Inglis Co., Ltd.

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

Sprockets:
Hans Renold of Canada, Limited, Montreal, Que.
Link-Belt Co.
Jones & Glassco (Regd.)

Spring Coil and Clips Electrico:
Canadian Steel Foundries, Ltd

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

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

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

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

Steel Drums:
Smart-Turner Machine Co.

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

Structural Steel Work (Light):
Hendrick Mfg. Co.

Stone Breakers:
Hadfields, Limited
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
Osborn, Sam'l (Canada) Limited.
Mussens, Limited
R. T. Gilman & Co.
The Wabi Iron Works

Sulphate of Copper:
The Mond Nickel Co., Ltd.
Coniagas Reduction Co.

Sulphate of Nickel:
The Mond Nickel Co., Ltd.

Surveying Instruments:
C. L. Berger

Switches and Switch Stand:
Canadian Steel Foundries, Ltd.
Mussens, Limited.

Switches and Turntables:
John J. Gartshore

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

Tanks:
R. T. Gilman & Co.

Tanks—Acid:
Canadian Chicago Bridge & Iron Works
The Mine & Smelter Supply Co.

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

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

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

Tanks—Oil Storage:
Canadian Chicago Bridge & Iron Works
The Mine & Smelter Supply Co.

Tanks (water) and Steel Towers:
Canadian Fairbanks-Morse Co., Ltd.
Canadian Chicago Bdidge & Iron Works
Gould, Shapley & Muir Co., Ltd.
MacKinnon Steel Co.
Mine & Smelter Supply Co.
The Wabi Iron Works

Tires—Auto, Truck and Bicycle:
Gutta Percha & Rubber, Ltd.

Canadian Miners' Buying Directory.—(Continued)

Tramway Points and Crossings:
Canadian Steel Foundries, Ltd
Hadfields, Limited

Transits:
C. L. Berger & Sons

Transformers:
Canadian Fairbanks-Morse Co., Ltd
R. T. Gilman & Co.
Northern Electric Co., Ltd

Transmission Appuiances:
Jones & Glassco (Regd.)

Transmission Machinery:
Hans Renold of Canada, Limited, Montreal, Que.
Jones & Glassco (Regd.)

Troughs (Conveyor):
Hendrick Manufacturing Co.

Trucks—Electric:
Canadian Fairbanks-Morse Co., Ltd.

Trucks—Hand:
Canadian Fairbanks-Morse Co., Ltd

TTrucks:
Canadian Fairbanks-Morse Co., Ltd

Tubs:
Hadfields, Limited

Tube Mills:
The Electric Steel & Metals Co
Fraser & Chalmers of Canada, Ltd
Hardinge Conical Mill Co.

Tube Mill Balls:
Canada Foundries & Forgings, Ltd.
Fraser & Chalmers of Canada, Ltd
Hull Iron & Steel Foundries, Ltd.

Tube Mill Liners:
Burnett & Crampton
Fraser & Chalmers of Canada, Ltd
Hull Iron & Steel Foundries, Ltd.

Turbines—Water Wheel:
MacGovern & Co.

Turbines—Steam:
Fraser & Chalmers of Canada, Ltd
MacGovern & Co.

Twincones:
Canada Foundries & Forgings, Ltd.

Uranium:
Everitt & Co.

Weighing Larries:
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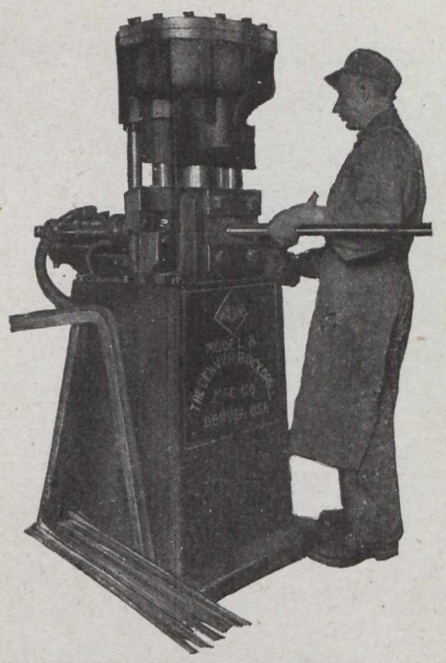

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