CANADIAN MINING JOURNAL

Vol. XLI. Gardenvale, P. Q., August 27, 1920. No. 34.

Angle Compound Compressors and Vibrations

In a vertical compressor vibration of the moving parts shakes the machine up and down.

In a horizontal compressor, the vibration shakes it back and forth.

In a cross compound compressor, the connecting rods and crankshaft form a couple which causes still other vibrations.

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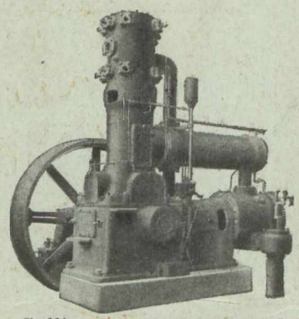

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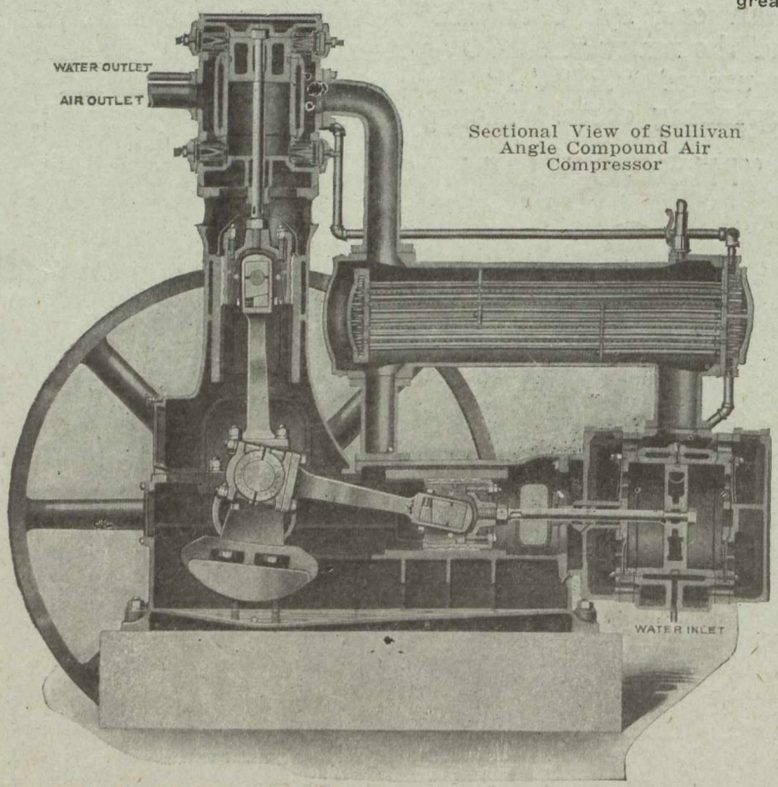

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Ontario's Mining Lands

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.

Building materials, such as ornamental marble, limestone sandstone , granite, trap, sand and gravel, meet every demand. Lime, Portland cement, brick and tile are manufactured within the Province.

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.

For list of publications, illustrated reports, geological maps and mining laws, apply to

Thos. W. Gibson,
Deputy Minister of Mines,
Toronto, Canada

Royal School of Mines Frecheville Research Fellowships

The Imperial College of Science and Technology, South Kensington, London, S.W. 7, with which the Royal School of Mines is incorporated, is offering two Research Fellowships of £300 a year each, tenable for one year and possibly renewable for a second year, to aid in carrying out any investigation or research connected with Mining, Mining Geology, Metallurgy, or Technology of Oil, which in the opinion of the Selection Committee is of sufficient use or promise.

Applicants, who may be Associates of the Royal School of Mines or others, and preferably men with some practical experience, if resident in Canada should apply in writing to the Secretary of the Canadian Mining Institute, Montreal, (from whom further particulars may be obtained), before 1st September, 1920, giving the nature of the proposed investigation, qualification for the work and references.

It is anticipated that the Committee will make the awards by the end of November, so that the Fellowships and work may begin on 1st January, 1921. Holders will be expected to devote their whole time to the work which may be conducted at the Imperial College or in special circumstances elsewhere at the discretion of the Committee.

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EDITORIAL

THE ASBESTOS INDUSTRY.

An account of the endeavors made in the United States in recent months to find asbestos deposits of good quality (which we copied—with due acknowledgment—from the Bulletin of the U.S. Geological Survey) has been twisted in Ontario newspapers to the attempted detriment of Canadian asbestos companies. The asbestos companies are stated to be "even worse than the International Nickel Company" that *bête noire* of a section of Ontario politics, which we take to represent the ultimate depth of perfidy. The inside story of nickel is soon to be exposed, so we are told. We are under the impression it had already been told, and quite voluminously. The suggestion is made that the inside story of asbestos would be equally redolent of iniquity. The International Nickel Company will we believe welcome the fullest enquiry into its affairs. The "inside story" of asbestos will be found written in the Annual Reports of the Quebec Department of Mines, but, fortunately for Quebec, that province is not so given to corporation baiting as some other provinces in Canada.

The fact that asbestos is not as yet spun and manufactured into finished articles on a larger scale in Canada is not perhaps entirely a matter for congratulation, but it represents a phase through which most primary industries have to pass. This phase will not be shortened by ill-advised railings against the conduct of an industry that has passed through some very evil times and has only recently obtained a position of financial stability.

The recent large and rapid increases in the selling price of various grades of Canadian asbestos are stated in the 1919 Report of the Quebec Department of Mines "to be due to an extension and development of the known uses rather than to new applications and utilizations." In many cases, asbestos is but a single component in a manufactured article that consists of a combination of materials, as, for example, in the case of steam packings of various patented makes, where asbestos, graphite, metallic wire, rubber, and possibly a lubricant enter into the fabrication of one article.

The criticism to which we take exception speaks of the "refining" of asbestos, but no analogy can be properly instituted between the extraction of metals from their ores, and the working up of the thousand and one specialized articles of which asbestos is a component .The most accurate analogy in Canadian life may be drawn between asbestos and pulp-wood, and when the time is ripe, Canadian enterprise can be trusted to supplement the production of crude asbestos by its further utilization in manufactures in Canada, as is being done in the case of pulp-wood and paper.

The existence of an avid market for asbestos in the United States cannot be considered as a reproach to Canada, as has been intimated. The Quebec Mine Report mentions that two mining industries in that province, namely the production of chromite and magnesite, are threatened in their future prosperity by possible closing of the United State's market consequent upon the mooted imposition of a protective import tariff. The export of these two minerals has not been objected to, and in Quebec it is regarded as desirable. The export of asbestos differs only in degree, but not in principle.

It is not desirable that the export of any Canadian minerals to any friendly nation shall be discouraged, because such a policy involves a restriction of mineral production in Canada. Canada needs the largest possible export of mineral products, combined with maximum use of domestic mined minerals within our own borders. The last-named desideratum is not, however, one that will be obtained by government regulation of exports—as is suggested—but by private manufacturing enterprise.

To mine the minerals we possess to the fullest extent would be—as in the classic cases of coal and iron—the best possible way to diminish unnecessary imports; and to mine and export to the fullest extent the minerals that we uniquely possess would be the best way to reduce our adverse trade balance. The mining industry in Canada does not require control, but it does require aid and comfort from our governing bodies, and a readjustment of that jaundiced view which assumes that because an industry is big and efficient it is therefore evil.

CORPORATION BAITING.

Those of our readers who see that excellent weekly, "Chemical and Metallurgical Engineering" may have noted a rather interesting piece of detective work which led to the arrest of clever thieves who had stolen platinum from the Old Hickory Powder Plant at Jacksonsville, Tennessee. The chemical analysis of the stolen material was a determining factor in the detection of the thief, and a feature of interest to readers in Canada was the statement made by one of the accused men that the sponge platinum in their possession

had been obtained "by placer mining on an unregistered claim in a region about one hundred miles north of Parry Sound, Ontario." The authorities ascertained by enquiry from the Department of Mines that the total annual production of platinum in Canada did not exceed 25 ounces, and that no placer mining of platinum was carried on in Ontario.

This quite interesting account of chemistry applied to the detection of crime has been reproduced in the "Literary Digest" as being of general interest, but the Toronto "World" finds the account "very suspicious" and, rather ungrammatically, states editorially "You'd almost think the long and exact account of "the trapping of the thieves was printed in that paper "for some special reason." This "special reason" the "World" surmises is because the International and Mond Nickel Companies wish to convey to the Canadian public the impression that the "whole annual output of platinum does not exceed 25 troy ounces."

We remember on a previous occasion that an article advocating the electrification of the Canadian National Railways which appeared in this journal, which suggested the use of the slack coal from a colliery with an annual output of 180,000 tons, was discovered by the "World" to be inspired by the "coal barons of Nova Scotia." At that time we thought it was impossible that Torontonian perspicacity could go further, but apparently there are no limits to the penetrating vision of those who have chosen corporation baiting as a vocation.

A full and complete account of the platinum production of Canada will be found in the Report of Mineral Production for 1919 issued by the Mineral Resources Division of the Mines Branch at Ottawa. The Toronto newspaper states that the Ontario and Ottawa Mines Departments "have been forced by the long compaign "of the 'World' to at last begin to express their suspicion that a very valuable amount of platinum has "been taken out of the nickel ore from the Sudbury "Mines". We would not consider the definite statements of the two Mines Departments as "expressing a suspicion". Ottawa states that the International Nickel Corporation reports for 1919 a recovery, in Canada of 25 ounces of platinum and 62 ounces of palladium, with also a small quantity of fine gold and silver. It also is stated in the Ottawa report that recoveries in New Jersey during 1918, as reported by the Annual Reports of the United States included 649.7 ozs. of platinum, 786.6 ozs. of palladium and 472.5 ozs. of rhodium. While it is not possible to state exactly how much of this recovery of platinum group metals originates in Sudbury mattes, it is believed, states the Ottawa report, "the Sudbury mattes have been the source of the greater part of the platinum group metals recovered."

We can conceive of no reason why the International Nickel Company desires to convey to the public any other impression than is given by the published reports of the provincial and federal Mines Departments, and if, as the "World" states, the Mond Nickel Company in a recent London prospectus referred to the possible recovery of platinum group metals, it is merely a proof that there is no desire on the part of the Mond Company to conceal a thing that is common knowledge.

To use Lloyd George's most recent epigram, the "World" is flinging a sledge hammer at an open door. Its criticisms are not important, being based on erroneous surmises, but the attitude of this newspaper is important to the extent that it reflects unjustified criticism of large investments of United States capital in Canadian mining venures. The greater the number of United States investments in our mining fields the greater will be their development. The larger the number of refining and manufacturing plants that United States interests can be induced by fair means to operate in Canada, the better will Canadians be pleased, and we take it to be a proper and laudible policy to bring this about by legitimate means—to which our friends in the United States as shrewd business men will be the last to sincerely object. Nevertheless, there are most pressing reasons to deprecate the use of jaundiced inuendo, and the perversion of national loyalties to effect commercial ends. There is no more dangerous citizen abroad today than he who deliberately stirs up strife between Canada and the United States, and this in effect, if not in intention, is what the "World" is doing.

LENIN'S IDEA OF A STABLE GOVERNMENT.

> The most intelligent and richest bourgeoisie are those of England and America. The English are the most experienced and the best administrators. They afford us the best examples of personal dictatorship in its highest form, the most stable kind of a government which has consolidated power in the hands of a single class. . . . I believe that if you will keep in mind this English example you will comprehend this question of personal control better than from any number of abstract resolutions and preconceived theories. . . . I hope the gentlemen present, who are experienced Water Transport Workers and therefore know what good management is, will appreciate that we must first of all be good business men, and must dispense with our industrial Soviets and run things without them. Every branch of administrative work calls for special training and qualifications.

The foregoing is not an extract from a capitalistic organ, nor the opinion of a bourgeois professor of political economy. It is an extract from a speech made by Nikolaie Lenin before the Third All-Russian Congress of Water Transport Workers. From all accounts Lenin is in a position to compare at first hand the results of administrative work by men without special training and qualifications, and his opinion is for that reason a weighty one. It coincides fairly exactly with the opinions expressed by Mrs. Phillip Snowden and Bertrand Russell on their return to England after a visit to Russia.

OUR "CURIOUS PLEA FOR PATERNALISM."

The Sydney "Post" takes exception to our suggestion that a federal loan should be made to the Nova Scotian coal companies to assist in the development of new collieries, and believes that any millions the Government has to spend can be laid out "in a million better ways than that suggested by the 'Mining Journal.'"

The objection of the "Post" is apparently based on an assumption that our "curious plea for paternalism" is advanced in the interest of the coal operators, whereas the basis of the argument is that deficient production of the bituminous coal in Canada is a national menace requiring definite aid and a definite policy on the part of the Government to remove. No criticism is made of the existing government of Canada that is not applicable to all previous governments, for none of them have ever grasped the fundamental importance of coal production to Canada. It may serve as an illustration of the very general inability of the public —and its reflection, the government in power at any given time—to understand the true national position of coal production, when a newspaper circulating in a community that depends for its daily bread on coal production, deprecates a suggestion that the government should assist coal production by loans to be devoted to the extension of output.

We suggested that the expansion of the production of the Nova Scotia collieries to a point commensurate with the potentialities of the coal deposit, and adequate to meet the domestic needs of Canada, involved a capital expenditure entirely beyond the ability of the coal companies to handle, and we believe this statement will be found to stand unimpugned, once it is admitted that coal production is a national necessity. Any possible difference of opinion lies in the admission or non-admission of the paramount need for a domestic source of coal production in Canada.

Coal production on a much enlarged scale is a principle condition of the persistence of the Canadian nation. It is more important than agriculture or any other form of industry, because without coal production neither agriculture or any form of manufacturing industry could exist. The Province of Ontario alone requires 12 million tons of bituminous coal annually, or more than twice the production of Nova Scotia. Every form of industry in Canada has in the past few years been throttled and prevented from attaining its possible development by coal shortage or fear of coal shortage.

The Canadian Government itself, as owner of the National Railways and as owner of a fleet of merchant steamships, is very intimately interested in the availability of coal. The Provincial Government of Nova Scotia depends on coal royalties for its revenues almost entirely. The export trade of Canada depends entirely on the availability of coal for its existence. The adverse balance of trade with the United States against Canada is largely made up of imports of coal and steel, and things made with the aid of coal. Is it then quite correct to say that there are a million better ways in which the Government could spend money than in loans to increase the production in Canada of the most important raw material known to civilization?

It is intimated that our suggestion will appeal to none "but the interested operators". That is to be doubted. It may well be entirely unwelcome and objectionable from certain standpoints of the operator.

In making the suggestion, the "Journal" did not have in mind either operators, operatives or politics. There is no body of men more interested in the preservation of Canada's capacity for bituminous coal production than the Canadian Federal Government for the time being, because the continued existence of that government and the persistence of Canada as a separate and independent political entity in North America hinges on whether we will or will not take steps to stop this decline in domestic coal production, and thereby assure this country of some modicum of industrial independence.

The coal problem in Canada is a permanent one, and we shall not approach a solution until it is studied from a national standpoint by a permanent body appointed for that purpose. The "Canadian Mining Journal" holds no brief for the coal operator, but being a periodical devoted to the progress of mining and metallurgy in Canada, it conceives that it is carrying out a proper function in calling attention to the unsolved condition of the problem of coal supply, on which all mining and all metallurgy depends.

THE COAL EXPORT EMBARGO.

Our contemporary "Coal Age" suggests that the embargo on export coal is unfair to the coal producer unless a proportionate embargo is placed upon the export of manufactured products which consume coal in the making. The point is well made. "Coal Age" suggests that the coal industry in the United States would be willing to participate in a curtailment of coal export "in like degree with the manufacturers of any other commodity that consumes coal in its making and that requires transportation in the process of getting it out of the country. Any other programme for increasing the supply of coal for home consumption by decreasing exports is as unfair to the home coal industry as it is to the foreign consumer."

It would be interesting to see a list of the things that do not consume coal in the making and do not require coal for transportation to seaboard. It would be indeed a list of things that "aint". The tendency is for large manufacturers to acquire their own coal areas, to be operated for their own manufacturing uses, and a large part of the coal producing capacity

of all countries is in this way passing under the control of interests that are not primarily engaged in the supply of house and ordinarily marketed coal. Coal mining as the base of a manufacturing industry occupies a proper place, and the manufacturer who acquires coal mines is wise in his day. Coal mining, prosecuted singly as means of commercial profit, has not, however, been remarkably successful. It will not be surprising, in the future years, to see the "coal operator" as he is now known, disappear, to be replaced by men who are not willing to act the part of a common laborer for industry in the digging of coal, but will follow coal into all the ultimate profit-making uses that ramify throughout the entire fabric of the modern world.

THE INTEREST OF THE COAL PRODUCER IN COAL DISTRIBUTION.

Evidence was recently given before the Board of Commerce sitting in Victoria, British Columbia, that a coal dealer was accustomed to pay $7.50 for a long ton of coal at the pithead, which he retailed in Victoria at $12 per short ton, the equivalent of $13.44 per long ton. After allowing for cost of handling the coal and delivering it into the customers' cellar, this dealer concluded that his average profit had been $2.50 per ton.

From the records of the Fuel Administrations of the United States and Canada we believe that the figure named by the Vancouver dealer does not represent fairly even the profit made by coal dealers upon sales of domestic coal in small lots to private customers. Transactions in car-load lots, and contracts for large quantities of coal for manufacturing purposes and large buildings are conducted on a smaller spread. The extent of the profit of the dealer upon domestic business is, however, one to cause the coal producer to think.

Those who have had experience of the operating costs of coal production know that very large expenditures, both of money and of mental and physical energy, are required to effect an economy of a few cents in the unit cost of coal production. They also know that a profit of $2.50 per ton is a possibility that does not enter into the most roseate dreams of a coal mine operator. If the financial risks and the scale of the coal mine operator's undertaking is compared with that of the coal dealer the disproportion will be found to be striking, and the proportionately smaller reward of the coal operator equally striking.

These considerations give point to a suggestion, previously urged on several occasions in the "Journal", that the coal mine operator, wherever it is found possible, should control not only the comparatively thankless and unremunerative operation of coal production, but should control further the handling and distribution of the coal to the point of ultimate destination in the customers' cellars or storage bunkers.

Unless the coal mine operator is prepared to do this, he is likely to continue to bear unjustly the odium of a "spread" in coal selling prices with which he has nothing to do, but for all of which he will be blamed by the uninformed public, certain of no pertinent facts except the ever-rising price of coal.

The basic nature of coal in fixing prices of all commodities is little understood, and is least understood by those who control the mining and sale of coal, otherwise their carelessness of what happens to the price of coal after it leaves the pitmouth is not understandable. We doubt whether any condition would be more potent in reducing commodity prices in Canada than a plentiful supply of coal at moderate prices and the coal producer is the person most interested in seeing that the price paid by the ultimate consumer is as low as it can be made.

Up to the point of leaving the colliery yard every possible device of economy is made use of to lower the unit cost of coal production. Production costs are dissected minutely and discussed in cents and fractions of cents, but as soon as the colliery premises are left behind—or just as soon as the handling and transportation of the coal ceases to be controlled by the producer — inefficiency, with its corresponding cost, commences and continues to the point of ultimate destination.

It is advisable, in the interest of the producer of coal and the consumer alike, that wherever possible the producer should control every revenue-producing stage of coal handling and transportation from the coal face to the consumer's cellar.

The coal producer, who spends half a million dollars to take five cents a ton off coal haulage costs, cannot, if he appreciates his own interests, view with disinterestedness the carriage of coal along city streets in winter weather in half-ton lots.

We are pleased to note the whole-hearted manner in which the Canadian collieries (Dunsmuir) Limited go about arranging a picnic for the employees. Free transportation for five thousand people to the seashore, fifteen thousand ice-cream cones, chocolates, oranges and sports for the children, are some of the items noted in a Vancouver Island paper. The presence of all the officials, from the President down, and a general spirit of good feeling is in marked contrast to times happily gone by. The fashion is one that it is to be hoped may spread.

The death is announced from Ottawa of Dr. William James Wilson, for many years the paeleobotanist of the Geological Survey at the age of 69 years. It is hoped to make more extended reference to Dr. Wilson's scientific attainments in a later issue.

Mining Operations in Quebec During 1919

In the first issue of the "Journal" in 1920 we were able through the courtesy of the Superintendent of Mines, Mr. Theo. Denis to give a summary of mining operations in Quebec during 1919, with approximate figures. At that time it was thought that the total value of the mineral production of the Province, as was the case in all other provinces of Canada, would be appreciably less than the figures for 1918, whereas the exact figures now available show that in 1919 the curve of aggregate annual values of the mineral production for Quebec continued its uninterrupted rising course and reached the highest figure yet recorded. The 1919 value was $2,105,908 or 11.3 per cent. in excess of the value of 1918, and the unremitting progress of Quebec as a mineral producer is shown by the following table, taken from the Report of the Superintendent of Mines, now to hand for 1919, viz.,

Table of Value of Annual Mineral Production of Quebec from 1900 to 1919.

Year	Value
1900	$ 2,546,076
1901	2,997,731
1902	2,985,463
1903	2,772,762
1904	3,023,568
1905	3,750,300
1906	5,019,932
1907	5,391,368
1908	5,458,998
1909	5,552,062
1910	7,323,281
1911	8,679,786
1912	11,187,110
1913	13,119,811
1914	11,732,783
1915	11,465,873
1916	13,287,024
1917	16,189,179
1918	18,707,762
1919	20,813,670

The industry employs 8,930 workers, with wages totalling $7,341,619. Asbestos is by far the most important single branch of mining in Quebec, seeing that it employs 45 per cent. of the workers and disburses 54 per cent. of the wages of the total industry. The quarrying and preparation of building materials and cement is an increasingly valuable feature in Quebec, employing 37 per cent. of the workers and disbursing 32 per cent. of the wages. The manufacture of cement contributes 21 per cent. of the total mineral production value of 1919, comparing with only 16 per cent. in 1918.

The Superintendent of Mines properly congratulates the Province of Quebec on so favorable a showing in the disturbed period which has followed the Armistice, and is the more worthy of note in Quebec because that province contributed notably to the output of minerals such as pyrites, molybdenite, magnesite and chromite that were in unusual demand during the war period and ceased to be in demand when the war ended.

The striking freedom of Quebec from social disquiet is attributed by Mr. Denis to the confidence of the people of the province in "the judgment and the advice of the 'directing' classes" and their indifference to "the insinuative, and often plausible, urgings of theorists who have panaceas to bring about the advent of utopian conditions, and of the Millenium."

It is pointed out that the increase in mineral production value is to be attributed to higher unit prices rather than to increases in tonnage for the same items. For example, the main product of the Provinces, asbestos, shows an increase in value in 1919 of 279 per cent., but a tonnage increase of only 33 per cent. Cement shows an increase of 33.6 per cent., but a decrease in quantity of 20.5 per cent. Brick value is increased 7.8 per cent., but quantity production is decreased by 31.3 per cent.

The Report includes a description of the gold-bearing area on Lake de Montigny in the Abitibi Region[1], and on the molybdenite deposits of La Corne Township, in the same region by Adhemar Mailhiot of the University of Montreal, and accounts of investigations made by Mr. Denis on the alleged discovery of a new goldfield in the unsurveyed portion of Gaboury Township, to the south of Lake des Quinze and on an occurrence of serpentine near Lake Mackenzie in the same township.

Attention is called to the large unknown area of Quebec and the dearth of trained geologists, and the use of the areoplane to aid prospecting is suggested.

Again, and not unnecessarily, the Quebec Mines Report warns against fraudulent mining-stock offerings. It would be well if Quebec newspapers would give as much publicity to Mr. Denis's warning as they do to the advertising of dubious mine stocks.

Asbestos.

The following statistics regarding the mining of asbestos are condensed from the Report:

	1919 Tons	1918 Tons
Rock mined and hoisted during year	3,061,690	2,445,745
Asbestos produced	154,378	159,225
Pounds asbestos per ton rock	101 lbs.	117 lbs.
Value per pound	$3.88	$4.08
Total value	$10,995,300	$9,053,945

There is in Canada only one manufactury of asbestos products, namely that of the Asbestos Manufacturing Co., at Lachine, where there are produced asbestos slates, shingles, sheathing, mill-board, paper and pipe coverings. Eighty-nine per cent. of the Canadian shipments of asbestos go to the United States, seven per cent. to England and the remaining three per cent. to other countries.

Operations are reported by sixteen companies in the Black Lake, Thetford, Coleraine, Danville, Robertson and East Broughton Districts. An interesting development is the progression of open-pit mining to the "glory-hole" method in the operations of the Asbestos Corporation of Canada, and the use of shafts for haulage of rock and in some instances of men,

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[1]See "The Upper Harricana River Gold Area," issue of 14th Oct. 1919 page 765. A. Mailhiot.

[2]See "Molybdenite Deposits of La Corne Township, Abitibi, P.Q." issue 18th February 1920, page 135. A. Mailhiot.

thereby doing away with ladders, and eliminating interference with operations by weather conditions.

Chromite.

Production of chromite fell to 8,184 tons valued at $223,331 compared with 23,000 tons valued at $770,955 in 1918, and the future of the industry depends largely on whether the United States imposes an import duty on chrome.

Copper and Sulphur Ores.

Production in 1919 was 53,965 tons valued at $447,623 comparing with 125,446 tons valued at $1,319,690 in 1918. Copper contents of ore shipped amounted to 5,751,188 pounds, a substantial portion of which is to be credited to the re-opened Huntingdon Mine[3].

Activities of all the mines were affected during the early part of 1919 by the lack of demand for pyrites and the low price of copper.

Molybdenite.

Only one production of molybdenite is reported for 1919, namely 83,002 lbs. of molybdenite from the Moss Mine of the Dominion Molybdenite Co. Operations ceased at this mine on March 10th 1919 owing to market conditions. The deposit is not exhausted, and the mill equipment is described as remarkably efficient. Should the demand arise, the Quebec deposits will be able to produce moderate quantities of molybdenite for an indefinite period. Prof. Mailhiot's report on the La Corne deposit is published in this section of the Report.

Zinc and Lead.

Shipments were confined to the Port Neuf District, and totalled 5,318 tons valued at $103,138, a decrease of 2,320 tons of ore and of $71,956 value compared with 1918.

The Federal Zinc and Lead Co., which is developing the promising deposits of zinc and lead ores in the region of the Cascapedia River[4], devoted most of its energy to road-building during the year.

Gold and Silver.

The production in 1919, as formerly, came from the treatment of the copper-sulphur ores of the Eastern Townships and the zinc-lead ores of Portneuf Co. Gold so recovered totalled 1,446 ozs. and silver 127,223 ozs.

A description of the development work in the Lac de Montigny District is given in Prof. Mailhiot's report, but no gold production is recorded in the 1919 figures from this newly discovered occurrence.

Magnesite.

Magnesite to the extent of 9,940 tons was produced in Quebec in 1919, being a considerable decrease from the figures of 1918. Important shipments of dead-burned magnesite were made during 1919 to most of the steel mills in the Eastern United States and in Canada, the Report mentioning the following concerns who have used Quebec magnesite with satisfaction, namely, Bethlehem Steel Co., Carnegie Steel Co., Jones and Laughlin, Atlas Crucible Co., Halcomb Steel Co., Ludlum Steel Co., and all the Canadian steel plants. Like chromite, the future of the Quebec magnesite industry depends on whether or not a prohibitive protective tariff is imposed on importations from Canada into the United States.

[3]See issue of August 6th 1919, page 582. "The Huntingdon Mine". R. E. Hore.

[4]See issue of 6th February, 1920, page 102. "Zinc and Lead Deposits of Gaspesia. J. C. Beidelman.

Graphite.

There was no commercial production of graphite in Quebec during 1919. The industry is in a waiting condition, and much depends on the possibilities of improvements in concentration practice, which have been very fully dealt with in recent number of this journal[5].

Mica.

Mica production is valued at $224,988 an increase of eleven per cent. on 1918 value. As so much depends on the grade of the mica placed on the market quantity comparisons are not especially valuable. The 1919 production is estimated at 3,853,265 pounds. Eighty-two per cent. of Canadian mica is credited to Quebec.

Miscellaneous Mineral Products.

Production of iron oxide and ochre is valued at $111,645, a reduction of 30 per cent. in quantity, but of equivalent value to the figures of 1918.

Silica and vein quartz production is valued at $50,161, a decrease from 1918 figures being due to the lessened demand for silica used in the manufacture of ferro-silicon.

Peat, for the first time, is recorded in the Mines Report of the Province. The producers are the "Tourbieres des Laurentides" with head office at Grand Mere, who work the Garneau Junction Bog, peat being delivered for domestic uses at Grand Mere by auto-truck, a haul of four miles. The peat is cut and stacked for drying in the old-fashioned way. The Bog is said to be 500 acres in extent with a depth of peat varying from 5 to 11 feet.

Wages and Accident Statistics.

The average wage of workers in the mineral industry has increased from $593 annually in 1915 to $968 and $1,025 respectively in 1918 and 1919.

Fatal accident rate in 1919 was, for all branches of the industry, 1.67 per thousand workmen. Very complete statistical information on the incidence of accidents is given.

The Report of the Superintendent of Mines for Quebec is a carefully compiled volume. Wherever information of a scientific or commercial nature seems desirable it is included in a form likely to be helpful to mining men. The Province is to be congratulated on its unique position in 1919, as being the only province in Canada to report an increase over 1918, and on the comprehensive and accurate nature of the Annual Report.

[5]See issue August 20th 1920, article by R. C. Rowe, page 676. Also issue August 6th, 1920, page 636, and articles by Chas. Spearman, issues 12th Feb., 6th Aug., 1919, and 16th Jan., 18th June 1920.

Oil Found by Imperial Oil Company North of Great Slave Lake.

Oil has been struck by the Imperial Oil Company, Limited, at a point just within the Arctic Circle, north of the Great Slave Lake, and close to the Mackenzie River. The flow of oil is small, and possibly cannot be made use of economically, but it is regarded as significant that oil has been found there. The flow is ten barrels a day. At Czar, Alberta, the Company's drill is down 2,000 feet.

THE BLACK DIAMOND MINE FATALITY WITH BREATHING APPARATUS.

Report by the British Columbia Chief Inspector of Mines.

Coal Mine Operators and Coal Miners will be interested in a report, which has been issued in bulletin form by the Provincial Department of Mines, on the accident to members of Mine Rescue Teams which occurred at the Black Diamond Mine of the Pacific Coast Coal Co., State of Washington, on Saturday, July 10th, 1920.

Hon. Wm. Sloan, Minister of Mines, on being informed of the serious character of the accident, three men losing their lives and others having narrow escapes, instructed James McGregor, Chief Inspector of Mines, to investigate.

Mr. McGregor's report, together with some supplementary official comments, are included in the afore mentioned Bulletin. The former details the circumstances very fully and the latter make a number of pointed references to the happening that are particularly instructive and interesting reading.

These follow :

"This accident in no way discredits the efficiency and safety of the apparatus when handled properly.

"The plain facts of the case are that this team (that is the Black Diamond Mine Rescue Team, which last year won the championship in competition with teams from the entire Pacific Northwest and two of whose members were lost on this occasion) attempted a feat in ordinary practice that any sane man would have given very serious consideration before permitting even in a case of emergency.

"The place to be travelled was dangerous being full of carbonmonoxide gas, (CO_2). There was no need to take the risk in ordinary practice work.

"The roadway to be travelled by the team was the worst possible for men wearing mine rescue apparatus, being of heavy grade and very rough.

"To go in with such a supply of oxygen (the tanks were shown to have been only partially charged), knowing the conditions, was suicidal.

"The slope to be travelled by the team is 1400 feet in length and pitches 35 degrees and with the rails being lifted was in very dangerous and rough condition for walking. A person in good physical condition without mine rescue apparatus would have his work cut out to make this return trip in 30 minutes, yet the men attempted to make it with one of their number only having 45 minutes supply of oxygen, two having 50 minutes supply, one 60 and one 90 minutes supply.

"It is notable that the one with the 45 minute supply was one of the survivors, the machine he was wearing being a Gibbs. This can be attributed to the automatic feed, which would function according to the wearer's demands. Both men lost were wearing the Draeger type of apparatus, 1916 model, which are not equipped with the automatic feed arrangement, the machines giving a constant supply of oxygen and not functioning according to the wearer's demands. After the accident the machines were all found to be in good condition and if they had been properly charged before going in the mine there would have been no accident.

"The rough conditions encountered on the slope can be imagined when it took five teams of four men each to get out the bodies of the victims."

PORT ARTHUR NOTES.

By J. J. O'CONNOR

Territory near Thunder and Black Bay to be prospected for Oil.

In 1911-12, Mr. J. A. Beam, of New Bethlehem, Pa., visited this district and made a thorough examination of the formation and physical features of the territory adjacent to Thunder and Black Bays, with a view to its oil and gas possibilities. His long experience, as a gas and oil operator in other fields, forced him to the conclusion that there was more than an even chance of finding both oil and gas in paying quantities in this territory.

As a result of his investigations, the Nepigon Prospecting Company, a close corporation, has been formed with J. A. Beam, of New Bethlehem, Pa., as operator in a large way of oil, gas, coal and railways in Pennsylvania, as President, Jobe Burton, of Pittsburg, Pa., manufacturer, as vice-president, and A. E. Annis, of Orangeville, Ont., contractor, as Superintendent of operations.

The company have secured through A. E. Annis, leases covering 30,000 acres of land, in Dorion, McTavish, McGregor, Pearson and Sibley townships, including the Woods Location, (Silver Islet) excepting the Silver Islet Mine. The leases are the usual form in use in the oil fields of Lambton County, Ontario, and other oil fields. The owner of the fee is to receive one-eighth of the oil, and $100 per well, after the first year. If no drilling be done, the owner of the fee is to receive ten cents per acre after the second year, and if no drilling be done at the end of five years, the company forfeits all rights under its lease.

It is the present intention to have the drilling done by contract, if suitable arrangements can be made. If not, the company will bring in its own drills from Pennsylvania, under experienced drill operators. The first hole will be put down on the Woods Location. It is expected that no results will be obtained under 1700 feet, and possibly at a much greater depth. However, it is intended to pursue the drilling until the formation has been thoroughly tested. The drills will be in operation by October 1st, next, and continue through the winter. The old road from Silver Islet to Sawyer's Bay, will be cleared out, and motor trucks used in taking in supplies from Sawyer's Bay, during the winter, so as to avoid going round Thunder Cape, at seasons when the passage by ice is difficult and dangerous, in the early Winter and Spring. The Head Office of the company will be at Port Arthur.

Grace Mine on Eagle Lake to Resume Work.

The Grace Mining Company, George J. Blake, 300 Broadway, Buffalo, N. Y., President, with Head Office at Toronto, Ont, and 300 Broadway, Buffalo, N. Y. is resuming active mining operations after nearly a decade of inactivity.

The Grace mine is situated 21 miles south of Eagle River station, on the Canadian Pacific Railway, on the shore of Eagle Lake. The present development consists of a complete camp equipment, and a ten-stamp mill. The main shaft is down 150 feet, with considerable drifting and cross-cutting, on a strong highly-mineralized quartz veins, yielding an average of over $23 per ton in free-milling gold ore. Arrangements are completed for continuous operations during the coming Winter, with a full staff of miners.

The organization is composed entirely of American

capitalists, who are expected to visit the property when the engineer in charge gets the work of mining underway.

Captain Walpole Roland, with a crew of men, two car-loads of machinery, a gasoline launch, a scow and a general outfit of supplies arrived at Vermillion Bay, Eagle Lake, on August 12th, and on the following day proceeded by launch to the mine, where the preliminary work of unwatering will begin, directly pumps can be installed. On the completion of unwatering active mining will be proceeded with.

NOTES FROM THE NOVA SCOTIA COLLIERIES.

Springhill Mines.

Several days idleness has resulted from a dispute between the management and the boiler firemen, which has been adjusted. Disputes in connection with the development work at the No. 7 Slope and in connection with underground rates at No. 2 Slope have also been adjusted by increasing the rates.

A new slope, to be known as No. 8 Slope, has been commenced by the Dominion Coal Company.

Increase of Benefits in Relief Association.

The several branches of the Dominion Coal Workers' Relief Association have agreed to increase the weekly subscription from 25 cents to 30 cents. The relief payment will be raised from $6.00 to $9.00 per week. The Dominion Coal Company, which pays on a fifty-fifty basis with the employees, is also increasing its payment. This society deals entirely with cases of sickness and death not arising out of employment.

The Royal Commission on Wages.

The Commission, which has been taking evidence in the Minto District, is expected to hold final sessions in Sydney, before filling its decision.

Dominion Coal Bankhead Escapes Fire.

By prompt measures the Reserve Bankhead of the Dominion Coal Company, which serves Nos. 5 and 10 collieries, was saved from destruction by fire on the 26th August. A previous bankhead at Reserve Collieries was destroyed by fire in October 1906.

The Hiawatha Coal Co.

This new coal company is opening up a mine on the General Montgomery Moore areas at False Bay Beach, in the Morien Basin of the Sydney Field. The take of the company is stated to cover two square miles of the Tracey Seam, estimated to contain ten million tons of coal. At the shore crop, the seam shows a thickness of 4 ft. 8 ins., but inland it is believed to increase in thickness. Some dredging will have to be done to obtain a berth for loading vessels to open up a passage from the sea to False Bay Lake. Coal may be shipped during the remainder of the year, but it is not expected that operations will be large until next Spring.

ASBESTOS NOTES.

An English invention is a pulley made of asbestos and cement, designed to run at very high speeds. It is said to be satisfactory in operation, with good balance, and costing much less than aluminum pulleys.

"Asbestos" states that reports come from Luzon, Philippine Islands of a property yielding considerable quantities of Nos. 1, 2 and 3 qualities of asbestos, with some fibres three feet in length. "Asbestos" is investigating these reports and more definite information may be forthcoming.

ASBESTOS TRADE CONDITIONS IN EUROPE

"Asbestos" for July contains a resume of the asbestos situation in Europe by Mr. B. Marcuse, President of the Asbestos and Mineral Corporation who has recently visited Europe.

Mr. Marcuse reports that there are a great many plants making shingles, textiles, sheet packings and mill boards and that, while all these plants have been seriously hampered by inoperation during the war, and by the terrific drop in exchange since the war, they are gradually and surely resuming operation. It will, however, in Mr. Marcuse's opinion, be quite some time before their production will be sufficient to care for home consumption. Hence it is unlikely that much of the foreign made product will appear in the world market for some time to come.

It is interesting to note that in France, as well as in Germany, the manufacturers are associated in a syndicate or Groupment, which to a large extent buys and allocates raw material, exchanges trade information, and presents a united front to outside competition. In Germany this Groupment is directly under Government control, and has charge of all imports and exports. Practically no exports are now permitted, since Germany was quite barren of all Asbestos during the war and has not yet caught up with home demands.

During the war the United States was exporting to Europe quite large quantities of Asbestos goods but, now that the European plants are again producing, that market will automatically be closed to United States shippers. Since the foreign plants cannot do much more than care for home requirements, it is evident that the one big foreign outlet is South America. Tremendous development is going forward in South America, and at least one United States manufacturer has been fully alive to the possibilities there, for he has maintained several direct representatives in South America for the past few years, and records of exports furnished by the U. S. Customs Office indicate that the market is a good one.

Asbestos Products—Prices Current July 1920.

(From "Asbestos.")

Average market prices paid by consumers for average quantity, quality and freight haul from producer, were about as follows:

Asbestos Air Cell Covering, 4 Ply	35% to 40% off
" Air Cell Paper in Rolls	$10.00 to $12.00
" Cement	$1.75 to $3.00 cwt.
" Cloths, 10s Commercial	$1.50 to $2.00 lb.
" Listings and Tapes	$1.75 to $1.90 lb.
" Millboard	$12.00 to $18.00 cwt.
" Packing, Steam, High Pressure	$1.25 to $2.00 lb.
" Packing Sheet	$1.00 to $1.50 lb.
" Wick and Rope	.65 to $1.00 lb.
" Paper, Commercial	$12.00 to $18.00 cwt.
" Paper ,and Millboard Special	$17.00 to $35.00 cwt.
" Yarns, 10s Commercial	$1.35 to $1.90 lb.
" Yarn and Cloth, Special	$2.00 to $6.00 lb.
Magnesia Carbonate, Powdered	15c. to 20c. lb.
85% Magnesia and Boiler Covering	5% to 15% off.

SALT FOUND AT FORT McMURRAY.

Announcement is made from Edmonton that salt of good quality has been discovered at a depth of 523 feet at Fort McMurray.

OBITUARY.

J. C. Gwillim.

Mr. J. C. Gwillim, for several years professor of mining engineering at Queen's University died in Kingston on Thursday August 19. Funeral services will be held in Kingston on Saturday. The body will then be shipped to Winnipeg for burial.

Professor Gwillim was well known in mining circles throughout Canada. He was not only an able engineer but a successful teacher of mining engineering. He was one of the most popular professors at the School of Mining and the many graduates of that Institution will learn with regret of his demise. He leaves with them memories of a man worth knowing.

For some time Professor Gwillim had been suffering from the serious illness that resulted in his death. He spent several months in British Columbia in an endeavor to win back his health, but recently was compelled to resign his position on the staff of the University.

Dr. ELLIS DEAD.

Dr. William H. Ellis died on Monday, August 23, at Lake Joseph, Muskoka. He was for some years, Dean of the Faculty of Applied Science at the University of Toronto, succeeding the late Dean Galbraith in 1914. Previously he was professor of chemistry in the same Institution, having been identified with the School of Science since 1878. Before that he had been instructor in chemistry in the College of Technology, Ontario's first technical college.

School of Science men all knew and liked Prof. Elis. He had a great part in building up the Institution that now ranks with the best engineering colleges. He served well and long.

Dr. Ellis was born in Derbyshire. He graduated from the University of Toronto in 1867. He died in his 75th year.—R. E. H.

PERSONALS.

Mr. Dwight L. Woodbridge has returned from a trip to the Belcher Islands, Hudson Bay. Mr. Woodbridge was examining iron ore deposits there for American interests.

Mr. Murray Kennedy has been appointed manager of the Trethewey silver mine at Gowganda. Mr. Stewart Thorne who was manager at the Trethewey mine at Cobalt when he left for overseas has been in charge of the Gowganda property for some months, but has resigned owing to poor health.

Sir Charles Wright and Capt. Leighton Davies are in Toronto inspecting the Toronto plant of Baldwin Ltd. This company will soon be producing iron and steel sheets and tinplate at the Ashbridge bay property taken over from British Forgings.

METAL QUOTATIONS.

Fair prices for Ingot Metals in Montreal August 26th 1920. (For shipment from stock, and in less than car-load lots:

Copper, electro	24¼
Copper castings	23¾
Tin	53
Lead	9
Zinc	10½
Aluminium	35
Antimony	8¾

THE FINANCIAL RESULTS OF GOLD MINING IN NORTHERN ONTARIO.

The following brief anaylsis of the result of gold mining operations in Northern Ontario, dating from the time the first dividend was paid, up to the middle of the current year, gives a fair idea of the results achieved to date.

One feature not dealt with in detail at this time is the ore reserves at the various mines. In this connection, the broad statement may be made that ore actually in sight at the proven mines amounts to close to 70 million dollars, while that indicated in the mines both prospective and proven amounts to close to 100 million.

Following are figures showing production from year to year, as well as the amount of dividends paid during each twelve-month period:—

Gold Production from Porcupine.

Year	Value produced
	$
1910	35,539
1911	15,437
1912	1,730,628
1913	4,294,113
1914	5,190,794
1915	7,480,901
1916	9,397,536
1917	8,229,744
1918	7,833,966
1919	9,941,803
1920 (est. first half)	5,500,000
Total	$59,650,461

Kirkland Lake Production.

Year	Value produced
	$
1913	26,232
1914	74,590
1915	555,539
1916	702,761
1917	404,356
1918	636,667
1919	486,809
1920 (est. first half)	570,000*
Total	$3,456,955

Note:* The output for the first half of 1920 from the mines of the Kirkland lake district has exceeded the whole of 1919, during which year a labor strike caused the mines to close down for over four months.

Dividends from Kirkland Lake Camp.

Year	Value produced
	$
1915	65,187
1916	260,750
1917	(nil)
1918	100,000
1919	100,000
1920 (first half)	50,000
Total	$575,937

Dividends from Porcupine Field.

Year	Value produced $
1912	270,000
1913	1,182,000
1914	1,410,000
1915	2,360,000
1916	4,166,000
1917	1,699,542
1918	1,771,000
1919	2,083,028
1920 (first half)	1,299,028
Total	$16,240,598

Summary of Gold Production.

Porcupine	$59,650,461
Kirkland Lake	3,456,955
Grand Total	$63,107,416

Summary of Dividends.

Porcupine	$16,240,598
Kirkland Lake	575,937
Grand Total	$16,816,535

It should be noted that while only $16,816,535 has been paid out of a total gold production of $63,107,-416, the producing mines have all built up large treasury surpluses, as well as spent a large amount of current earnings on building up ore reserves which assures larger dividends than ever before, and means that as the mines become older the total dividends paid will represent a larger percentage of the total production than has been the case up to the present.

DAVIDSON CONSOLIDATED GOLD MINES, LTD.

For several months the directors of Davidson Consolidated Gold Mines Ltd., have been negotiating with English interests to make the mine a big producer of gold. The directors have now announced to shareholders that a satisfactory conclusion to these negotiations has been arrived at. The shareholders are now asked for their approval of the deal and co-operation in making it possible.

According to the letter just sent to shareholders arrangements have been made for the sale of 1,500,000 treasury shares at 75 cents per share; the proceeds of this sale in principal to the applied towards the carrying out of an extensive plan of development, which has been decided upon by arrangement between the English interests and the Davidson directors. A condition of the offer is that the English interests shall receive an option on 2,000,000 shares—1,000,000 at $1 and 1,000,000 at $1.25, the option to remain in force for nine months after the first 500 ton unit of the mill is completed, but in no event to exceed a period of two years. In order to carry out this arrangement it will be necessary for each shareholder to contribute 50 per cent. of his holdings towards the option.

The development planned includes the sinking of a 3 compartment working shaft to a depth of at least 1,000 feet, the construction of a mill with a daily capacity of 1,000 tons, the first unit of which (500 tons) shall be undertaken in the immediate future.

President G. C. Crean in his letter points out that the report on the property made by Messrs. Bert and Loring for the company is fully confirmed by the examination and report of Colonel Fielding of London, who was sent out by the English interests to examine the property.—R.E.H.

TORONTO NOTES.

The mica mine at Blue Mountain, near the head of Stoney Lake, Peterboro County, Ontario, which was unsuccessfully operated about a quarter of a century ago, has been purchased through the Supreme Court of Ontario, from the Bradford estate, which was being settled in that court by two American engineers, C. L. Nicholson of New York and Norman Miller of Michigan. It is expected that the mine will be in operation by the middle of September with an output of about 100 pounds a day. The machinery and equipment are now on the way to the mine and labor has been arranged for. The output is contracted for until after Christmas and three firms are trying to contract for the mine's total output. The most serious difficulty that will confront the new operators will be that of transportation. The mine is located about four miles from the head of Stoney Lake, which is about twenty miles from the terminal of the Grand Trunk at Lakefield. The mica will have to be hauled over poor roads to the head of the lake and there towed down Stoney and Clear Lakes to the railway at Lakefield. During the winter sleighs will be used to haul the mica over the lake to the railway. It is stated that the former operators of the mine failed to make it a paying proposition because they spent too much money on road construction. The new enterprise, however, is confident of success and claims that the mine is rich.

According to the quarterly report issued by the Bailey Silver Mines, Limited, the gross earnings of the Bailey Custom Mill at Cobalt for the first quarter were in excess of $50,477, and the net profit from milling operations were $22,951. It is stated that the mine has a large tonnage of ore actually developed and with the completion of the railway siding at the mine will commence immediate shipment of its developed ore to the mill, which should then show a net profit in excess of $1,000 daily.

THE FINISHED WORK OF THE BOLSHEVIKI.

The folowing opinions on the results of the applied doctrine of the Bolshevists are extracted from an article contributed to a Parisian newspaper by H. B. Sliozberg, a lawyer of Petrograd, who was so fortunate as to escape from that devoted city.

"The Bolsheviki wanted to destroy the bourgeoisie; instead of that they have merely strengthened and increased it."

"They attempted to introduce agriculture on a communistic basis; instead of that they have developed in the peasantry a still stronger desire to own land."

"The Bolsheviki attempted to subject the industrial life of the country to the government, but instead of that they merely destroyed and disorganized it."

"The Bolsheviki attempted to spread enlightenment in the masses, but instead of that they have paralyzed science and art."

GABRIELLE MINES PROPERTIES UNFAVORABLY REPORTED UPON.

Although a discouraging report has been received from J. B. Tyrrell, mining engineer, of the value and quality of the quartz from the Gabrielle Mines, Ltd., directors of that company are determined to carry on the work next year. Lieut.-Col. A. C. Gray, president, announced that a report had been made to him by Mr. Tyrrell, one of the most competent mining engineers in Canada, showing that assays showed little promise of returns from the property, but that the officers, directors and shareholders were so confident of the value of the mine that they propose to go on with the operations next year if it is at all possible.

The Gabrielle properties consist of the Gabrielle, the Gabrielle Fraction and the Cartwright claims. The Gabrielle was the first mine discovered in the Rice Lake district, the discovery being made in March, 1911, by Maj. E. A. Pelletier, now vice-president of the company. The first assay in 1911 showed a yield of $130 a ton. Up to the present time there has been constructed 120 feet of shafting and 130 feet of drifting. A survey was made in 1919 by Mr. Tyrrell and in his report he said: "I believe you are justified in making arrangements to sink one or both of the shafts to depths of 100 feet at least and in drifting on the veins from these shafts. The property appeals to me as sufficiently attractive to warrant risking a reasonable amount of money in the hope of developing it into a paying mine."

His report to the directors concludes with the following : " There are four gold bearing veins known on the property. Two of them designated Nos. 2 and 4 respectively, are too small to deserve serious consideration. No. 1 vein is close to the shore of Rice Lake. Gold may be found in it in many places, but a careful sampling showed that the surface, the vein in the drift, and the dump taken from the drift all yielded assays varying from $4.80 to $4.87 in gold to the ton. No. 3 vein, near the north side of the Gabrielle claim, is the strongest and most continuous of any on the property but on the best exposed portions of its surface, for a length of 100 feet, it showed an average value of $3.88 in gold to the ton, while in the drift, at a depth of 64 feet below the surface, and for a length of 75 feet, it showed a value of $3.35 in gold to the ton. A dump beside the shaft, which had been taken from the shaft and drift, was sampled and yielded $4.80 to the ton. The results of the assays here quoted sho wvein-matter of much too low grade to be mined at a profit, and as there is no reason to believe that the veins contain more gold in some other places that have not yet been uncovered or explored, or that other and richer veins may be discovered, I recommend that all mining work on the property be discontinued. "

"The country does not deserve the blow that this report will give it," said Col. Gray. "We are just as enthusiastic as we were before over the mine and indeed over the whole Rice Lake district. "

He said that although the directors were upset by the report they are making arrangements to go on with the work next year. Pending further negotiations to carry on the work the mine will be closed at the end of this season. Old prospectors who have been over the ground carefully, he said, had faith in the claims. Some of them pointed out that four or five of the largest mines in the world were once condemned to be closed by competent engineers, but the "bull-headedness" of their owners kept them going. Major Pelletier has a claim adjoining the Gabrielle site, and he has announced that he intends to spend $5,000 there this winter in developing it.

Col. Gray states that a meeting of the shareholders will be called on September 14. At that time another report will be presented by Capt. C. A. Millican and by Col. Gray.

Since the claim was opened there have been 1,500 tons of rock removed and half a ton of this has been used for sampling. The average value of the samples has been about $60 a ton, it was said. Timber on the property is valued at $150,000. The claims are held under crown grants.—"Winnipeg Free Press."

SAFETY METHODS IN BUILDING CONSTRUCTION REDUCE ACCIDENTS.

An innovation in making provision for the safety of workmen engaged in building and construction work has been introduced in the erection of large extensions to the plant of the American Rolling Mill Company at Middletown, Ohio.

At 2 P. M. each Tuesday a committee composed of foremen, mechanics and laborers inspects the entire job from sewers to roof with the one purpose of seeing that proper methods are taken to safeguard the employees against accident. This committee makes a detailed report of each inspection to a representative safety committee, which considers and puts into effect the recommendations of the inspection committee.

The plan was introduced and is being carried out by Dwight P. Robinson & Company, Inc., a large engineering and construction organization which has been making careful investigations of various plants for protecting its employees.

The success of this program is being closely watched by various safety societies which are now encouraging day laborers as well as trained men to speed up their work. Experts in all types of building construction are agreed that the first marked reduction in building cost will come through increased production. The best features of this new safety plan are being copied by many large construction companies in the United States and Canada. The public is interested in the plan because indirectly it will lower rentals by reducing construction costs. This applies equally well to industrial constructions, large building projects and homes.

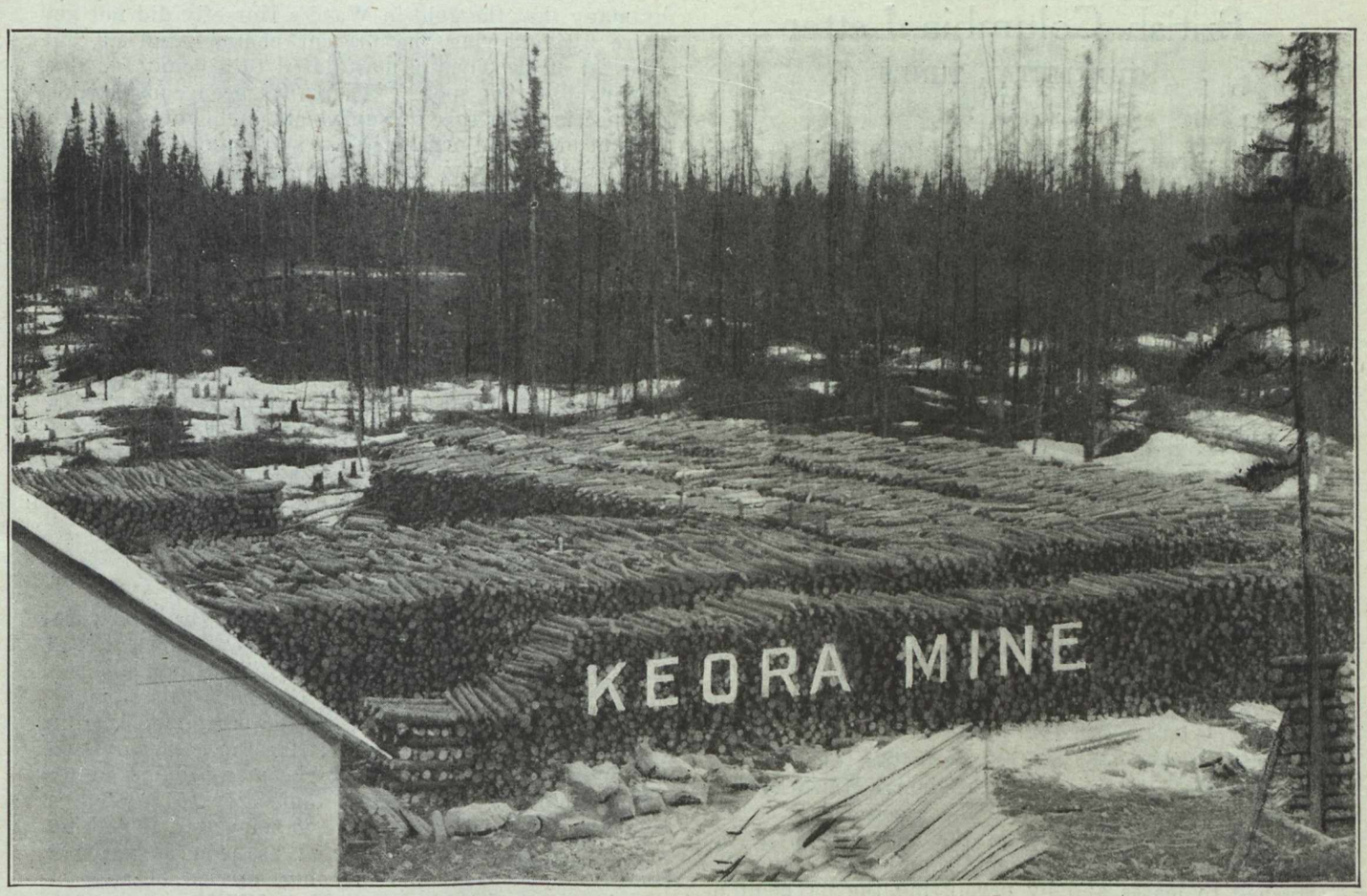
THE TORONTO EXHIBITION.

Canada has no institution which better reflects the national spirit than its National Exhibition, which stands a monument to the civic progressiveness of Toronto, a triumph of loyal, vigorous citizenship and one of the Queen City's greatest contributions to the educational service of the nation, and to her industrial efficiency and agricultural advancement. The paramount reason for the majority of Fairs and Exhibitions is primarily the exploitation of the immediate locale. Not so the Canadian National, with its annual attendance of 1,000,000 people, drawn from all parts of the continent. It is the arena for the display of the strength and enterprise of the whole nation and the testing ground for much that other nations have to offer, a giant kindergarten, where the hundreds of thousands go for relaxation and enjoyment and are taught, enlightened and elevated in thought without being conscious of the many influences at work. A year of travel in Canada can here be condensed into a few days' sight-seeing.

A NOTABLE GROUP.

Photograph taken at the office of the Dominion Steel Corporation in Sydney during the recent visit of the Directors to the Collieries and Steel Plant.

Top Row—H. E. Rice, General Superintendent; Col. Chas. W. McLean, Montreal; H. B. Smith, Director; E. P. Merrill, General Manager; Messrs. Christian and Johnson of the Montreal "Gazette."
Second Row—Roy M. Wolvin, President; Hon. C. P. Beaubien, Director; Sir William D. Reid, Director.
Second Row (seated)—J. Kempton, Secretary to President; J. F. M. Stewart, Director.
Bottom Row (seated)—Stanley E. Elkin, M.P., Director; Hon. J. P. B. Casgrain, Montreal.



Porcupine Keora Mining Company's Shaft, Powerhouse and Fuel-pile. Results of extensive drilling on the properties of this Company are reported in a recent circular to the shareholders.

British Columbia Letter

THE METAL MINES

Hazelton, B.C.

In his report for 1919, John D. Galloway, resident mining engineer, referring to the Rocher de Boule Mine stated that it was a formerly big copper producer but had remained inoperative all year. There was considerable milling ore available but no shipping ore pending further development. It now appears that the Mine is not likely to figure this year among the shippers it having been announced by J. D. Williams, who recently returned from the property, that there was no prospect of immediate resumption of work, as the copper market was not very active and the labor situation uncertain.

The Delta Copper Co's property, Rocher de Boule Mountain, is to be subjected to some exploration by means of the diamond drill. There has been some tunnelling in progress, but this has been found too slow and a drill will be put on the ground as soon as possible. If the results are satisfactory a permanent working tunnel will be driven.

The encouragement of the production of gold is a problem which is giving the Provincial Mines Department considerable concern. The amendments to the Placer Mining Act passed at the last Session of the Legislature by reducting rentals and other expenses attached to leases and by permitting the payment of arrears annually in comparatively small amounts it was thought would make it easy for those sincerely desirous of operating their holdings and at the same time squeeze out those who have been holding merely for speculation. Attention now is being turned to a more direct, and perhaps a more practical form of aid, J. D. Galloway, resident engineer with headquarters at Hazelton, having been authorized to continue Keystone drilling operations on the placer areas at Harpers Camp. This week was started last year, but, for various reasons, could not be finished. An expert crew of men has been engaged by Mr. Galloway and operations have been underway for some weeks. It is hoped that it will be possible to report satisfactory results at the end of the season. Mr. Galloway, in his 1918 report, gives detailed attention to placer mining conditions on the Horsefly River. First explaining that the important productive ground near Harpers Camp was an area lying in and about a bend of the Horsefly River, consisting in all of not more than 10 acres, and that the estimates of the amount of gold taken out of this area vary from $500,000 to $1,250,000 he proceeds to deal with the theory of the rich old channel, which the drilling now underway is expected to establish or disprove. It is pointed out that the character of the gold taken from the ground known as Ward's Horsefly was uniformly "fine, flat and well-worn" making it clear that it had travelled some distance and probably had its origin at some unknown point far up the Horsefly. The Horsefly River, both above and below Ward's Horsefly, has been fairly thoroughly prospected and a little gold has been taken out in places but no place has been found comparable in richness to the Ward ground. "The conclusion" Mr. Galloway continues "has therefore been reached by many that the gold in Ward's Horsefly did not get there by following the present channel and an old channel of the river is postulated to account for this remarkably rich spot." There has been considerable prospecting for this presumed channel, but the work has not been well organized nor sufficiently exhaustive to satisfy those who have examined the ground that it does or does not exist. Mr. Galloway then tells of operations down the Horsefly River at a point known as "Hobson's Horsefly", where the deposit of gravel worked was a short distance from the river and represented a former channel. In this connection he says : "The project was unsuccessful owing to the outside gravel changing to a cemented gravel, which is virtually a conglomerate. Hydraulicking therefore was of no avail and a small stamp-mill was erected to grind the cemented gravel. It was obvious that unless the ground was extremely rich placer-ground it was not pay to operate in this way. The mill was operated only a very short time when the work was stopped."

Stewart, B. C.

The Provincial Government, through the Mines Department, is making considerable expenditures in road and trail work in the Salmon and Bear River sections of the Portland Canal Mining Divisions this summer. The extension of the road to the Premier Mine in order to furnish a ready means for the transportation of supplies from the Coast to the many claims under development in that region, and later to provide a means for the shipment of ore to tidewater, is making good progress. It was started as soon as weather condition permitted and is being hurried because of the shortness of the season. Hon. William Sloan, Minister of Mines, is expected to visit the Camp in the course of a few weeks and it is possible that he will take the opportunity to inspect this work as well as to give his personal attention to some of the operations and requirements of the Bear River area. Lucien Danoel, a mining engineer and a professor of the University of Liège, visited the district recently accompanied by Théo. Collart, Belgian Consul at Vancouver. He paid special attention to the several properties in which the Algunican Mining & Development Co., a Belgian syndicate, is interested. On the Spider, one of these prospects, a tunnel has been driven 360 feet with good ore all the way and it is planned to ship ore next winter over the snow. The visitors commented favorably on the activity of the Provincial Government in opening up the country and on the great work being done by the United States authorities in the construction of a sixty-foot road from Hyder to the border.

Trail, B. C.

Four men were more or less seriously hurt recently while at work in the Copper Refinery of the Consolidated Mining & Smelting Co. All were burned about the face and one, Gordon O'Connor, may not recover his sight. Molton copper splashed between the moulds and into running water used for catching the drip. The copper was shot 40 feet into the air.

Ore receipts at the Trail Smelter of the Consolidated Mining & Smelting Co. for the week July 21 to 31 aggregated 12,862 tons and for the week August 1 to 7, 10,221 tons.

Nelson, B. C.

The Emma Mine of the Consolidated Mining & Smelting Co. will resume operations immediately with a force of 50 men. This property formerly shipped about six cars of ore a week, but work ceased last year when production was discontinued at the Rossland Mines. Now that the latter have been placed on a shipping basis the ore of the Emma is required as it makes a god flux for the product of Rossland. It is understood that its output will be about the same as before the close down. The ore is low-grade gold, silver and copper.

Vancouver, B. C.

Conditions at Keno Hill, Mayo District, Yukon Territory, where rich discoveries of silver are reported, are described by George F. Johnson, a mining man recently returned from the North. He says :

"Preliminary prospecting has uncovered evidence of as many as nine separate leads of silver-galena shipping-ore. The present known depth and length of these are such that shipping ore now in sight will require many years of considerable activity to mine.

"Taken from one of the "leads" on the plateau of Keno Hill is what the miners call the "War Baby Silver-Galena Nugget." It is one oblong piece of solid silver-galena, similar in shape to a large potato, weight estimated by experts to be 1200 pounds. From the same vein or ledge from which this piece came are four other nuggets or slabs. These are nearly solid silver-galena and by comparison the weight of the smallest is easily 800 pounds.

"On either side of these slabs, and also below and above the "ore vein" is in evidence, with manganese capping, carbonates and footwall, all of such character as to induce the prediction that further development may prove the district to possess the largest and richest silver deposits in the world.

"Owing to the surface character of some of the "leads" it has been possible to develop with comparatively little effort to a point where ore can be shipped. In places one man can "pick down" or mine a quarter of a ton of shipping ore per working day. Estimating this ore to be worth $200 per ton it is clear that some individual claim owners will be able to mine profitably. "

It is stated by Mr. Johnson that the holdings of the Yukon Silver-Lead Mining Co. were located and partially developed before the discovery of the Keno Hill properties. The former are situated on Mount Haldane or Lookout Mountain and are in direct line with Keno Hill and the Silver King, from one pocket of which silver is said to have been taken valued at $500,000. Much development has been done on Lookout Mountain, tunnels and shafts having been driven aggregating 1200 feet. It is stated that the vein has been followed for 400 feet perpendicularly, disclosing good shipping ore. Development on such properties as the Silver King, Mount Rambler and others in the section, as well as in the Twelve Mile area, should prove the extent of the area of the silver-galena bodies in the Yukon.

Considerable work is being done by the Canadian Geological Survey in British Columbia this year. Charles Camsell, until recently in charge of the western survey station and now Deputy Minister of Mines for the Dominion, states that there are twelve parties in the field. The topographical branch of the Survey is making two fine maps of the Vancouver area and other parties are at Salmon Arm in the Coquihalla District, at Bridge River on iron deposits, in the Lardeau and in the Eutsuk Lake areas, and on the west coast of Vancouver Island. There is another party at the mouth of the Fraser River studying the sedimentary deposits of the river.

Mr. Camsell announces, too, that important work is being done in the Province of Alberta, D.B. Dowling is continuing his oil investigation. Another party is examining the Peace River Coal Fields and another is mapping out the extension of the Crow's Nest Pass Coal Fields to the north. A further party is in the McKenzie River country working out the structure of possible oil bearing rocks.

Oil drilling rigs are actually installed and working in two areas, one in the Great Slave Lake region and another near the Arctic Circle, the latter being the scene of the most northerly oil drilling in the world. There is much oil drilling going on around Peace River Crossing and much gas and some oil has been found. The latter is heavy oil and is a pumping proposition.

The gold receipts at the Dominion of Canada assay office, Vancouver B.C., from January 1st to July 31st, 1920, are valued at $1,073,451.17. From April 1st to July 31st, 1920, they aggregated $819,216.72, or about $200,000 per month for the four months of the fiscal year 1920-21.

THE COLLIERIES

When the Board of Commerce of Canada held sessions recently in Victoria, B.C., evidence was submitted by what is known as the United Co-operative Society that there was a combination among the local Retail Coal Merchants as a result of which the former's demand for delivery of coal by the Collieries was refused. It also was charged that the retailers were charging unwarranted prices for the fuel. In reply the dealers denied that there was a combination, assorted that their influence with the Coal Operators was not sufficient to enable them to dictate to whom coal should be delivered, and that the prices asked for coal were reasonable. One firm admitted a profit of 90 cents a ton which was not considered excessive and others claimed their profits were not as great. It also was declared that coal was cheaper on the Pacific Coast than anywhere else in the world. Coal costs the consumer in Victoria, and it is approximately the same in Vancouver and elsewhere in British Columbia, from $7.50 a ton for slack to $14.50 for lump for domestic use.

It is announced by Dominion Government authorities, Ottawa, that although the embargo which came into effect on August 1st almost completely prevents the export of coal from the Eastern Canadian Provinces, it applies only to the Atlantic Coast. The Pacific Coast Collieries may still export coal. The Canadian Collieries (D) Ltd., and the Canadian Western Fuel Co., Vancouver Island, and possibly the Crow's Nest Pass Coal Co., Eastern British Columbia, are in a position to export considerable quantities. As the prices in this province are lower than in most parts of the world, and as the market and prices in European and other overseas parts, are satisfactory it is likely that this trade will grow. Already, as has been reported same shipments have been forwarded to Sweden and

elsewhere and, as there are many orders on hand and others are constantly coming, a material development of the business is promised.

The output of coal in Western Canada continues to be satisfactory. There was produced in the Province of Alberta during the first six months of 1918, 2,897,950 tons of coal while for the corresponding period of 1920 the output was 3,043,940 tons. The increase demand, however, has kept pace with the greater production as Alberta coal now is being used almost entirely as far East as the head of the Great Lakes. This, of course, is relieving very substantially the pressure on the supplies of Eastern Canada.

The negotiation of an important mining transaction, involving control of some of the greatest coal fields of the Province of Alberta, has been reported. As a result these properties are to pass into the hands of the McIntyre and Temiskaming Mining Companies of the Porcupine and Cobalt District, Ontario, respectively.

The Ontario companies are purchasing the Blue Diamond Coal Mines Ltd., of Brule, Alberta, a concern with an acreage of some six square miles and producing 500 tons of steam and domestic coal a day, and have optioned the Canadian Coal Fields Ltd., whose holdings cover a large tract of coal lands lying along the Hay river some thirty miles from the Blue Diamond. The Blue Diamond is capitalized at $1,500,000 and the Canadian Coal Fields Ltd., at $10,000,000. The option on the latter is understood to be for 15 years. The seller of the Blue Diamond is Messrs. McKenzie, Mann & Co., which concern also is a large holder in the optioned property. The purchaser of the property is the McIntyre Company, whose intention it is to share the deal with the Temiskaming Company on a fifty-fifty basis at the purchase price.

Engineers already are planning for considerable further development of the Blue Diamond Mines, it being the intention to install the mine plant and equipment necessary to permit an increase of production of from 600 to 2000 tons a day.

The production of coal in British Columbia for the month of July, 1920, follows :

Vancouver Island Field.

	Tons
Canadian Western Fuel Company, Nanaimo, B.C.	55,399
Canadian Collieries (D) Ltd, Comox	41,089
Canadian Collieries (D) Ltd, South Wellington	8,904
Canadian Collieries (D) Ltd., Extension	15,342
Pacific Coast Coal Mines Ltd, South Wellington	7,680
Nanoose-Wellington Collieries, Nanoose Bay	3,079
Granby Consolidated M. S. & P. Co., Cassidys	9,019
Total	140,512

Nicola-Princeton Field.

Middlesboro Collieries, Middlesboro	6,918
Fleming Coal Co., Merritt	2,626
Coalmont Collieries Ltd., Coalmont	1,984
Princeton Coal & Land Co., Princeton	2,114
Total	13,642

Crow's Nest Pass Field.

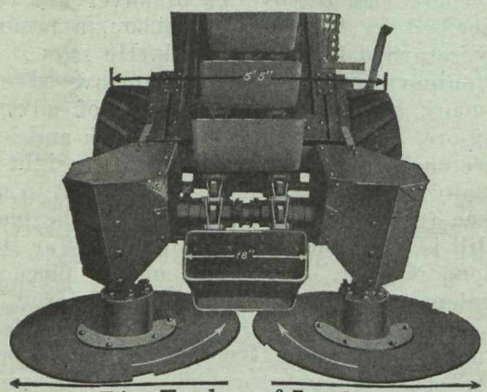
Crow's Nest Pass Coal Co., Coal Creek	38,073
Crow's Nest Pass Coal Co., Michel	22,172
Corbin Coal & Coke Co., Corbin	15,763
Total	76,008

COMBATING RISING COSTS BY REDUCING OPERATING EXPENSES.

Coal strikes, coal shortages and increasing prices have taught coal dealers and large consumers the wisdom of stocking and storing large amounts of coal. In that manner big reserves of fuel can be held against times of lessened production, blockaded traffic and increasing prices.

Such a plan is very advantageous but it encounters difficulties presented by the problems of handling the coal within the yards or storage space. Labor is scarce and wages high. These factors, coupled with the increasing prices of coal, make it very difficult to keep down rising costs.

However, it is the only way out. Coal prices cannot be reduced—they will go up instead of down. Nor

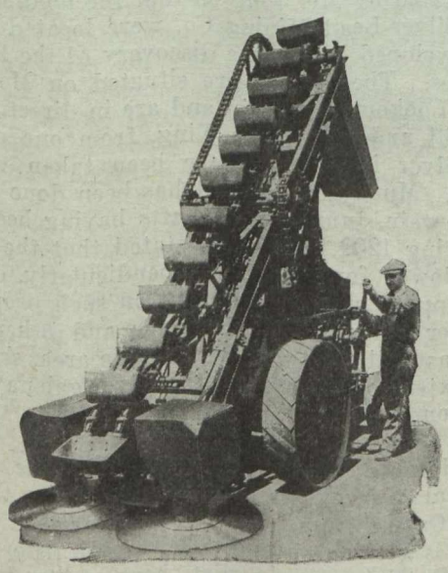


Disc Feeders of Loaders.

can cheaper labor be secured—it is difficult to get at any price. The only way left to combat coal costs is to reduce operating expenses.

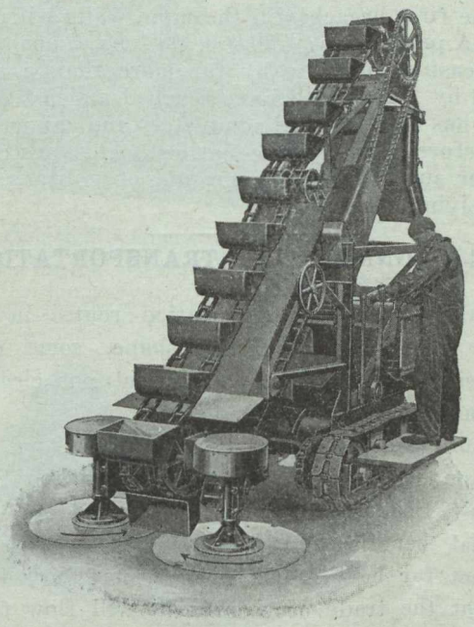
This question of lower operating costs also applies to business having large quantities of bulk material to handle which can no longer afford to use obsolete and expensive hand methods—a fact proven by the tremendous growth in the past few years of labor-saving machinery of all kinds.

For different operations, specific machines have been developed which perform that one operation at great savings in time, labor and money. Each type of machine has its particular place and function, but it is unusual when one machine can be used for a multitude of different tasks.



Old Type Barber-Greene Self-Feeding Bucket Loader with Traction Wheels.

The Barber-Greene Company of Aurora, Ill., have however, with their Self-Feeding Bucket Loader proved the exception to this general rule for the B.G. machines can do many jobs with equal ease and equal economy.



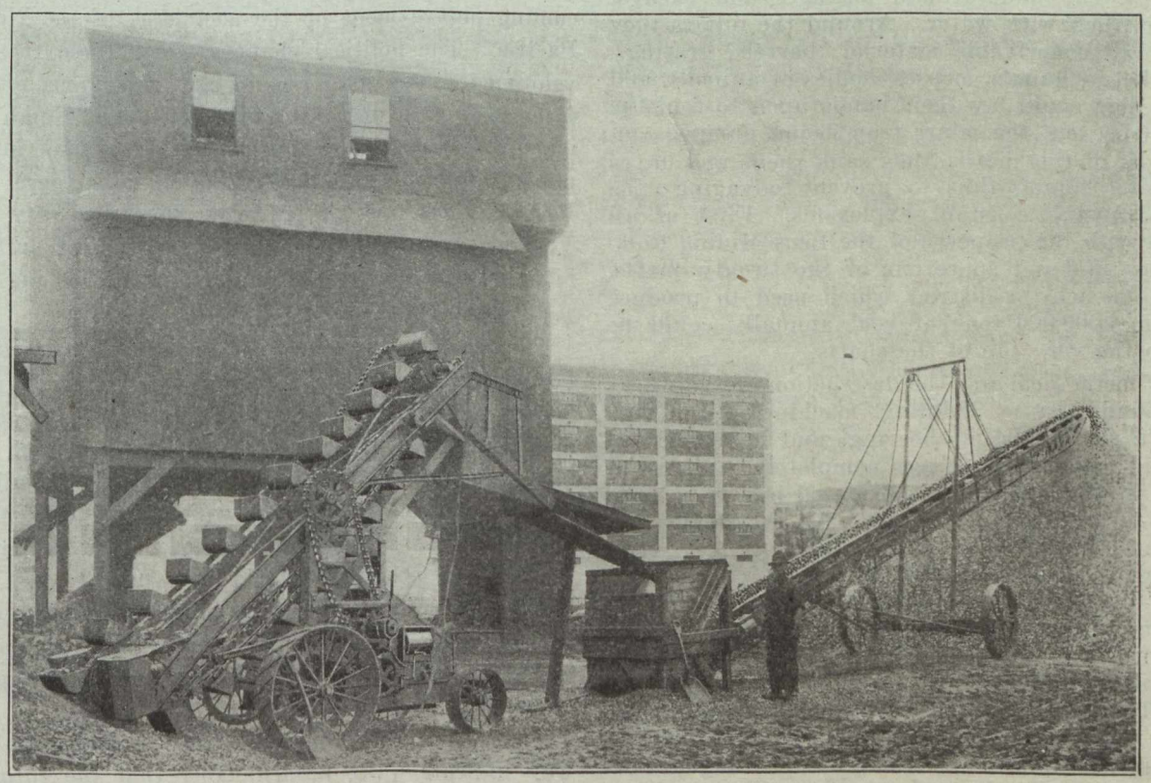
Being comparatively small and moving from place to place under their own power, they can move around a factory, yard, sand or gravel pit, road or paving job just as a gang of shovellers would change from job to job as needed. The difference is that only ONE man is required to operate the Loader, and this one man can move about 75 cubic yards per hour.

The distinguishing feature of the B.-G. Self-Feeding Bucket Loader is the Rotating Double-Disk Feeder (patented) at the base of the elevator. The feeder does the work of one or two men and gives the machine a range that is otherwise impossible. It enables the machine to dig to a width of six feet rather than to the bucket width, and the operator consequently has little difficulty in keeping the loader continuously up to the capacity.

The digging or feeding device consists of a pair or horizontal discs, set almost flat on the ground, but with a slight pitch toward the pile. The rotation of the two discs carries the material to the centre where it is picked up by the buckets digging from the smooth surface of the discs. The wide digging face of this loader enables it to handle a large quantity of material with very little movement and it also enables the machine to advance without obstruction into the pile.

The construction of the machine in general enables it to use the Disc Feeder to best advantage. The Discs deliver a large capacity to the Bucket Elevator and this in turn is of a size consistent with this capacity. It is designed for handling heavy materials and for very severe service. The frame construction and the crawlers embody strength; the chains and buckets are selected for wearing qualities; and the drive is designed to enable the operator to keep the machine at productive work for the maximum amount of time. A differential provides for turning sharp corners. A slow reverse feeding-speed is provided to enable the loader to be readily spotted on the job.

MODEL 20, the "last word" in Loader design and construction—the result of 18 months' study and ex-



Old Type B. G. Bucket Loader handling Coal from Stock Pile and delivering to B. G. Portable Belt Conveyor.

perimentation. It is simply a new and better model built along the same general lines as the hundreds of older B-G. Self-Feeding Bucket Loaders in daily operation all over the world.

The Barber-Greene Co., extend service to customers through their Branches and Agents, Mussens Limited, being their Canadian representatives.

WHY FRANCE WANTS COAL.

Maximilian Hardin, in a recent number of *Zukunft*, enforces upon his German readers a few wholesome truths regarding the coal deliveries demanded of Germany under the Treaty:

The **Bulletin de l'Association internationale des chemins de fer** has just published the following report: 'The new president of the Society of French Civil Engineers, Mr. Eduard Gruner, in his inaugural address, discussed the destruction and reconstruction of the coal districts in the North and Pas-de-Calais. Citing the records left by the German engineers themselves, he showed that Germany's work of destruction in these regions was thoroughly planned and carried out with all resources of expert engineering science. In August of 1915 they had ascertained scientifically the height of the ground water line in every shaft then working, and beginning with the advance shafts in Courrières and Lievin they started their work of destruction. The engineers in charge of this crime have themselves explained that they dropped into each shaft a small beam to the end of which was attached a mass of high explosive. The quantity varied from 80 to 200 kilos according to the estimation of the amount required in each particular instance to destroy the casing and cement work of the mine. The underground passages and excavations were filled with water. Around the pillars they assembled all conceivable material: barrels, gratings, cable, basketry, human corpses, bodies of animals, and whatever they could lay their hands upon to foul the water and prevent the mines from being pumped out. In the midst of this débris, they sank shells and boxes of dynamite, hoping thus to prevent salvaging the mines by causing constant explosions. First of all they dealt with the property of the Lens Mining Company. They did not spare one of the twenty shafts. This explains why a district which used to produce more than 4,000,000 tons of coal annually could be flooded to the very top of the shafts.

Equally methodical was the destruction of the works above ground. Every building, machine, piston rod, crankshaft, shaft, with its bearings and brackets, was cut up and broken into pieces completely with dynamite. It would have been considered a very serious oversight to leave a boiler intact. All the steam boilers, winches, and other pit head apparatus, were completely destroyed with explosives. Of 12,000 laborers' houses in Lens and thousands of small houses in the neighboring villages and country, not a single one was left intact. In October, 1918, the irresistible general advance of the Allied Army swept through these regions. Thereupon every shaft of the Mining Companies of the North, from Escarpelle to the gates of Douai and the collieries of Anzin on the Belgian border, was destroyed. In regions where a cannon was never heard, thirty or forty kilometers from combatant troops, by the 12th of October there was not a steam engine, a winch, or a pump, or a ventilating fan left. Everything was completely ruined. A few figures will show the extent of this destruction. For years to come 220 mines will be useless. The water is from 60 to 80 meters deep in them. Double or three times this quantity will have to be pumped out before the first breaches in the mine walls will be uncovered. A production of 20,000,000 tons of coal, which was increasing annually by far more than a million tons, and by 1920 would have reached at least 26,000,000 tons, has been stopped completely and cannot be resumed before 1920, at the earliest. This destruction was never justified on the ground of military necessity.—"Living Age."

A RE-ALIGNMENT OF TRANSPORTATION ROUTES.

A re-alignment of transportation routes in North America is assuming definite shape, some of the causes being undeveloped, and as yet not clear, and other causes more apparent.

The more general use of the Panama Canal is following upon the great port improvements on the Pacific Coast, Seattle having taken the lead and reaped the initial benefits of its expenditures, with Vancouver not far behind. More and more does it seem likely that the trade of the Orient will flow towards the Pacific ports, and that Vancouver will increase in importance and volume of shipping interchange. The growing strength of Japan, and the commercial impetus and increase in population which is likely to follow her occupation and administration of Eastern Siberia, Manchuria, Sakhalin, Corea, and the long heralded renaissance of China, which seems likely to take place under Japanese tutelage forecast much coming enlargement of the commerce of the Northern Pacific. The political changes which these future developments may give rise to are momentous and may force some re-adjustment of the attitude of North America towards Japanese and Chinese ambitions, but they point indubitably towards greater importance of the Pacific ports and the railway lines that serve them. The presence in China of great deposits of anthracite, bituminous coal, iron and alloy metals, is one of the significant facts indicating world destinies.

The great bituminous coal reserve of Canada lies bordering the crest and to a great extent on the Albertan side of the Rockies. This deposit is so large and unique in Canada that it must at some future date become the dominating centre of Canadian industry, and the focus from which transportation lines will radiate. Inspection of the map will show that the western coalfield is relatively near to the Pacific Coast, and that in days to come Vancouver will become a great coal-exporting port, and the point from which manufactured articles, made with the assistance of western coal will go out.

The recent conferences on the St. Lawrence waterway indicate quite unmistakably that the future will see ocean-going vessels going to Duluth and Port Arthur, which will not displant but will supplement the existing east to west rail lines, and others that are yet to be built. Such a route will mitigate those sea-

sonal crises in transportation which the periodical accumulation of crops combined with climatic conditions must always cause in North America, and it will be time to talk about redundance of transportation facilities and competition of facilities when it shall be demonstrated that existing routes are adequate. Most people will be of the opinion that their complete inadequacy has been proven.

From the viewpoint of the coal and steel industries of Canada, the importance of the St. Lawrence waterway—should its possibility be favorably reported upon by the engineers who are studying it—is that it will enable Nova Scotian coal and Newfoundland ore to be brought to steel plants and metal-working establishments in Ontario and Quebec, and thereby lessen a dependency upon our neighbors that has become a national menace.

There is the further consideration that the northwestern states of the Union are about as dependent upon British Columbia and Alberta for bituminous coal as Ontario is upon United States sources of supply. Quebec cannot be said to be dependent upon the United States for bituminous coal, as there is an amply sufficient potential source of supply in Nova Scotia, and the St. Lawrence waterway has for many years carried millions of tons annually from Nova Scotia to Quebec centres of consumption. When the coal fields of Alberta and British Columbia become the main source of bituminous coal supply along the Pacific coast the international exchange of coal between Canada and the United States will not be so humiliatingly lop-sided as is the case now.

There seems therefore emerging from today's readjustments a possibility that at some point in the Canadian West, perhaps not far from the Saskatchewan-Albertan border, there will be discernible the "water-shed" of traffic, from which on one side the stream will flow to the Pacific ports, and on the other side to the Atlantic ports of the Dominion. The shipment of manufactured articles from the East to the three provinces of Saskatchewan, Alberta and British Columbia will lessen as the coalfields provide a domestic source of articles that now originate so largely in the East, and to the southwards, and instead of being exporters of wheat and beef, and importers of mostly everything else, the prairie provinces and British Columbia will become exporters of manufactured articles, in addition to agricultural products, and importers of very little.

The one drawback to industrial eminence in the prairie provinces is the apparent lack of an iron-ore deposit. It is a little too soon, however, to assume that such a deposit may not yet be discovered within transportable range of the western coalfields. In British Columbia this difficulty is not so marked, and, on Vancouver Island, the necessary conditions for iron

smelting and steel manufacture seem to be present.

The inadequacy of rail transportation in North America is generally admitted at this time, and whether it is a breakdown of executive or operating conditions, or simply a reflex of social adjustments, it is difficult to form an opinion, but it is probably a combination of them all. Leaving this aside, the condition of rail transportation is causing much speculation on modes of improvement, prominent among which are proposals of electrification of steam roads, and long-distance motor-truck transportation, which is becoming more and more feasible with improvements of highways and truck design. It appears very likely that much development in both these directions will take place in the immediate future. The marked increase in motor manufactures in Canada shows that our manufacturers are reading the signs of the times, and this field has many possibilities in Canada, and is of interest to the steel trade in particular.

—From "Iron and Steel of Canada."

CAPTAIN J. G. ROSS.

Chairman of the Montreal Branch of the C. I. M. & M.

(From the August Bulletin.)

Captain J. G. Ross was born in Embro, Ontario, and obtained his early education at the Embro public school and at Woodstock Collegiate Institute. Later he entered McGill University, and, after taking the mining course, graduated in 1903 with the degree of B.Sc.

CAPTAIN J. G. ROSS

During his student days, Captain Ross had acquired his first mining experiences in British Columbia and Cape Breton, but during the two years following graduation, he was employed as resident engineer on the northern division of the Grand Trunk Railway. He returned to mining work, however, during the Cobalt "boom", and from Cobalt he went to New York as superintendent of construction on the Hudson River tunnels. In 1907 he was superintendent of the Worthington mine for the Mond Nickel Company, and during 1907 and 1909 he was examining mining properties in many parts of the world, including New Caledonia, Australia, South and Central Africa, Asia Minor, etc. After returning to Canada he spent the next year on examination work in Porcupine and British Columbia and in 1911 accepted the appointment of consulting engineer with the Milton Hersey Company, Limited., Montreal.

When war broke out in 1914, Captain Ross was already on the active list of the Canadian Militia and proceeded overseas with the 1st Contingent as Lieutenant in the 13th Battalion (Royal Highlanders of Canada). As battalion machine-gun officer he went through the strenuous fighting of the Second Battle of Ypres in April 1915. Subsequently he was appointed adjutant of the 13th and promoted on the field to Captain. During the next month at Festubert, Captain Ross was badly wounded by shell fire while the battalion was attacking on May 21st. He suffered a compound fracture of the right leg which confined him to hospital in England for many months. After leaving hospital he returned to Canada and was discharged with the rank of Captain. He resumed his consulting work with the Milton Hersey Company in 1916 and at present holds the position of consulting mining engineer for the company.

Captain Ross joined the Institute in 1911 and much of his spare time is devoted to its affairs. He was elected to the Council in 1919 and is also chairman of the Montreal Branch as well as a member of various committees.

ORNAMENTAL MARBLES FROM ST. JOSEPH DE BEAUCE, QUEBEC.

The British Canadian Marble Co., Ltd., of St. Joseph de Beauce, Quebec, financed by British capital, and owing extensive deposits of beautifully artistic green and red marble near St. Joseph village have just completed a mill for the treatment of red slate for the ready roofing trade. This slate is found adjacent to the marble. The mill has a capacity of 100 tons per day and is the first of its kind to be erected in Canada. It was designed, and built by Chas. Spearman, M.E. of Montreal. The marble quarries have been in operation since last April and are shipping to various points in Canada where new buildings require this material for interior finish.

It is understood that St. Joseph marbles will be used in the annex to the King Edward Hotel in Toronto, now building.

The Company has an experienced quarry foreman, Mr. M. Kelly, who comes from the Vermont marble district.

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
Canadian Link-Belt Co., Ltd.

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

Balls:
Canadian Foundries and Forgings, Ltd.
Canadian Steel Foundries, Ltd.
Hull Iron & Steel Foundries, Ltd.
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
The Wabi Iron Works.
The Hardinge Conical Mill Co.
Ball Mills:
Hardinge Conical Mill Co.
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
Canadian Link-Belt Co., Ltd.
The Mine & Smelter Supply Co.
Northern Canada Supply Co.
Jones & Glasco.
Belting:
R. T. Gilman & Co
Gutta Percha & Rubber, Ltd.
Belting—Silent Chain:
Canadian Link-Belt Co., Ltd.
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.
Canadian Link-Belt Co., Ltd.
Marsh Engineering Works
Mussens, Ltd.
MacKinnon Steel Co., Ltd.
Northern Canada Supply Co.
Fraser & Chalmers of Canada, Ltd.
The Wabi Iron Works
Buckets, Elevator:
Canadian Link-Belt Co., Ltd.
Hendrick Mfg. Co.

Cable—Aerial and Underground:
Canada Wire & Cable Co.
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

The Premier of Canada says the tariff policy of this country should be to keep Canadian workingmen in Canada, to make goods in Canada, and to give Canadian industries just enough advantage in the Canadian market to make it pay them better to stay here and expand, than to diminish their plants and leave. Mr. Meighen announces his Government intends to revise the tariff to secure these ends; that wherever a tax exists that is not necessary, it will be wiped out, that no interests, however powerful, will get more; and that no wreckers or theorists, however enthusiastic, will be permitted to imperil the well-being of the country by blindly fixing less. Whether Mr. Meighen's government can carry out this programme or not time alone will tell, but that Mr. Meighen has outlined the specifieation of national well-being few will deny. The phrase "wreckers or theorists" is a very happy one. Only too often the terms are synonymous, and while the theory is beautiful, the result is most dire.

The statement has been made by Senator Gideon Robertson, Minister of Labour, Ottawa, that there are at present vacancies for 600 men in the coal fields of the Province of Alberta, where miners are paid $10 and laborers $5 and $6 a day.

POSITION WANTED—Mining Executive, married, 30, technical graduate, 8 years in responsible positions as Mining Engineer and Superintendent in Canada. Also European mining experience. Well recommended, proven ability and capacity. Apply, Box 18, Canadian Mining Journal, Gardenvale, P. Q.

WANTED—Mine Foreman for Nova Scotia mine; must be experienced in drifting, shaft sinking, shaft timbering, etc.; one who can train men to do such work or who can bring a following of experienced men with him. Single man preferred, as mine is twenty miles from railroad and no family houses available. Camp has electric light and good bunk houses. Good board is provided. Write giving references and salary desired, which will be supplemented with bonus in proportion to results achieved. Address: Canadian Mining Journal, Box 17, Gardenvale, P. Que.

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:
Canada Wire & Cable Co.
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 & Gltssco
Northern Canada Supply Co.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Link-Belt Co., Ltd.
Greening, B., Wire Co., Ltd.

Chain Drives:
Jones & Glassco (Regd.)

Chain Drives—Silent and Steel Roller:
Canadian Link-Belt Co., Ltd.
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:
Canadian Link-Belt Co., Ltd.
Hans Renold of Canada, Limited, Montreal, Q

Coal:
Dominion 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
Canadian Link-Belt Co., Ltd.

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.
Canadian Link-Belt Co., Ltd.

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

Coal Pick Machines:
Sullivan Machinery Co.

Coal Screening Plants:
Canadian Link-Belt Co., Ltd.
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:
Canadian Link-Belt Co., Ltd.
The Mine & Smelter Supply Co.
Jones & Glassco (Regd.)

Conveyor Belts:
Gutta Percha & Rubber, Ltd.

Conveyor Flights:
Canadian Link-Belt Co., Ltd.
Hendrick Mfg. Co., Ltd.

Conveyor—Trough—Belt:
Canadian Fairbanks-Morse Co., Ltd
Canadian Link-Belt Co., Ltd.
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, Q

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.
Canada Wire & Cable Co.
Greening, B., Wire Co., Ltd.

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

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

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

Canadian Miners' Buying Directory.—(Continued)

The Mine & Smelter Supply Co.
Hadfields, Limited
Fraser & Chalmers of Canada. Ltd.
The Wabi Iron Works

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.
Canadian Link-Belt Co., Ltd.
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.
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.
Canadian Link-Belt Co., Ltd.

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, Lt

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
Canadian Link-Belt Co., Ltd.

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 Ste:
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.
Canadian Link-Belt 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 Canad:
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.
Canadian Link-Belt Co., Ltd.

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.
Canadian Link-Belt Co., Ltd.

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.
Canada Wire & Cable 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.
Canadian Link-Belt Co., Ltd.

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

Screens—Perforated Metal:
Hendrick Mfg. Co.

Screens—Shaking:
Canadian Link-Belt Co., Ltd.
Hendrick Mfg. Co.

Screens—Revolving:
Canadian Link-Belt Co., Ltd.
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:
Canadian Link-Belt Co., Ltd.
Hans Renold of Canada, Limited, Montreal, Que.

Silent and Steel Roller:
Canadian Link-Belt Co., Ltd.
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.
Canadian Link-Belt Co., Ltd.
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:
Canadian Link-Belt Co., Ltd.
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:
Canadian Mead-Morrison Co., Limited.

Welding—Rod and Flux:
Prest-O-Lite Co. of Canada, Ltd.
Imperial Brass Mfg. Co.

Welding and Cutting—Oxy-Acetylene:
Prest-O-Lite Co. of Canada, Ltd.
Canadian Fairbanks-Morse Co., Ltd
Imperial Brass Mfg. Co.

Wheels and Axles:
Canadian Steel Foundries, Ltd.
Hadfields, Limited
The Electric Steel & Metals Co
The Wabi Iron Works

Winches—Power Driven:
Canadian Mead-Morrison Co., Limited.

Winding Engines—Steam and Electric:
Canadian Fairbanks-Morse Co., Ltd
Canadian Ingersoll-Rand Co., Ltd.
Marsh Engineering Works
Fraser & Chalmers of Canada, Ltd.
The Electric Steel & Metals Co.
Mussens, Limited
R. T. Gilman & Co.
The Wabi Iron Works

Wire:
Canada Wire & Cable Co., Ltd.
Greening, B. Wire Co.

Wire—Bare and Insulated:
Canada Wire & Cable Co.

Wire Rope:
R. T. Gilman & Co.
Canada Wire and Iron Goods Company.
Canada Wire & Cable Co.
Dominion Wire Rope Co., Ltd.

Wire Rope Fittings:
Canada Wire and Iron Goods Company.
Canada Wire & Cable Co.

Wire Cloth:
Northern Canada Supply Co.
Greening, B. Wire Co.
Canada Wire & Iron Goods Company

Wire (Bars and Insulated):
Standard Underground Cable Co. of Canada, Ltd.
Northern Electric Co., Ltd.

Wolfram Ore:
Everitt & Co.

Woodworking Machinery:
Canadian Fairbanks-Morse Co., Ltd

Zirconium:
Everitt & Co.

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

Zinc Spelter:
Canada Metal Co., Ltd.
Hoyt Metal Co., Ltd.

ALPHABETICAL INDEX TO ADVERTISERS

CYANIDE

WHEN YOU NEED IT

The mills operating on Aero Brand Cyanide in Mexico, Canada and the United States, have never shut down from lack of cyanide.

The raw materials used in making Aero Brand Cyanide are obtainable in unfailing abundance—(1) **Cyanamid**—made at the same plant, for various purposes, at the rate of 72,000 tons per annum, and (2) **Common Salt,** readily obtainable in the open market in unlimited amounts.

The process of manufacture is simplicity itself —merely fusing the raw materials together in a suitable furnace.

Aero Brand Cyanide, developed three years ago to meet an acute cyanide shortage, and since used at the rate of thousands of tons per annum, has never missed shipment when wanted. Moreover, it is always sold, basis 100% NaCN, at prices practically equal to the lowest pre-war prices of sodium cyanide.

Send for Booklet C, telling about this dependable, money-saving product.

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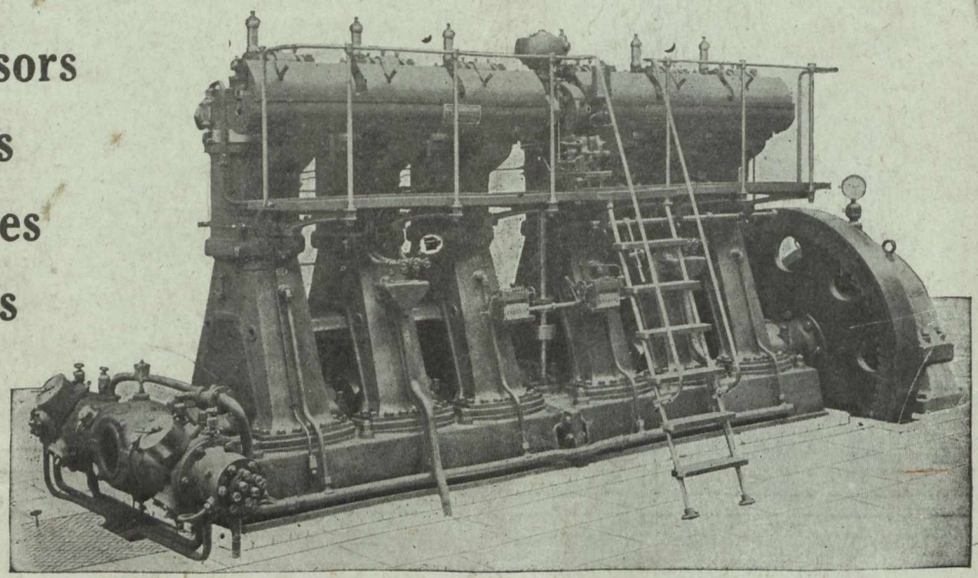
Air Compressors
Diesel Engines
Steam Turbines
Steam Engines
Condensers



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LAURIE & LAMB

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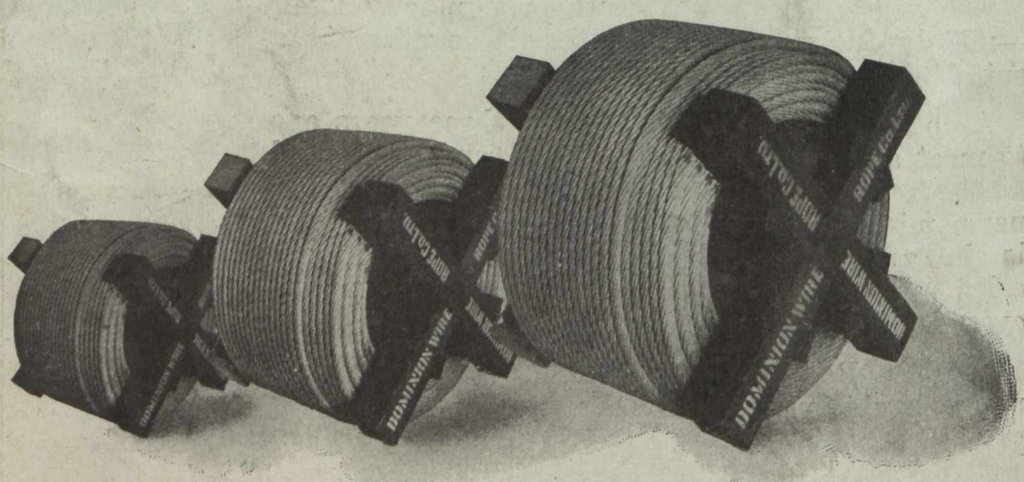
"MADE IN CANADA"

"DOMINION" WIRE ROPE



for
Mining, Hoisting, Haulage.

for
Cableways, Tramways.

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Head Office: MONTREAL

Stocks carried at: TORONTO WINNIPEG