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Established 1882

Vol. XX—No. VIII.

OTTAWA, AUGUST 31st, 1901.

Vol. XX—No. VIII.

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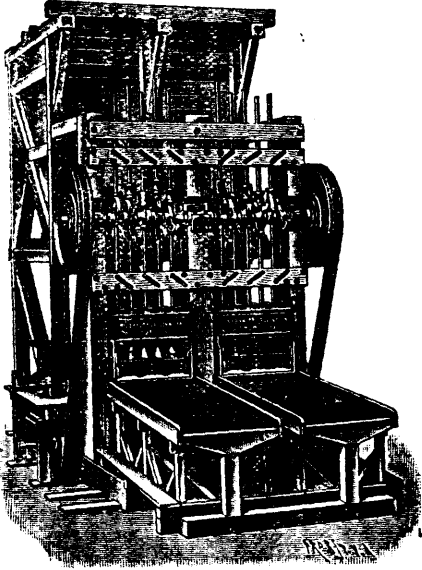
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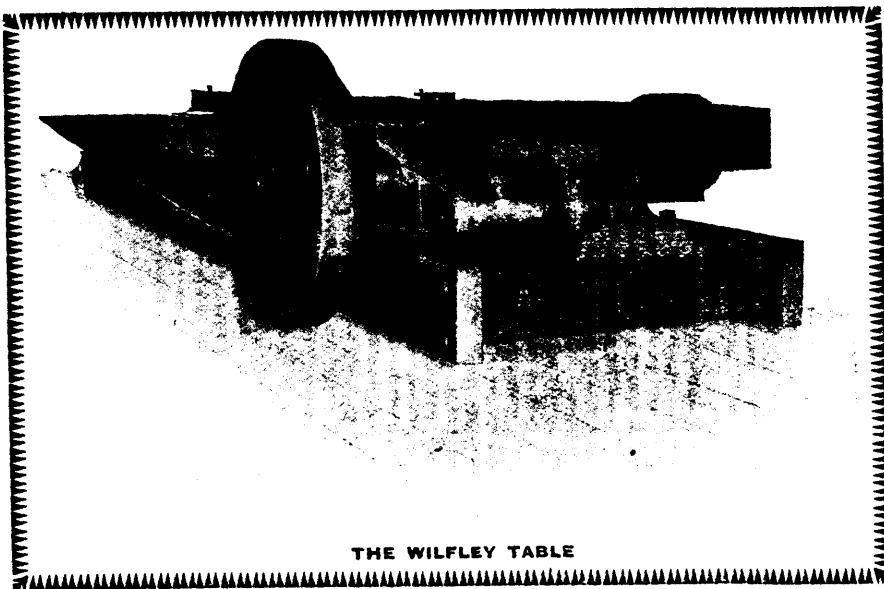
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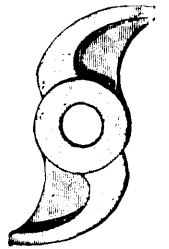
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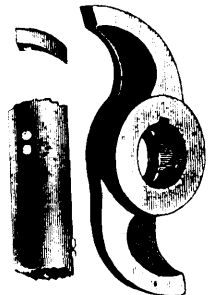
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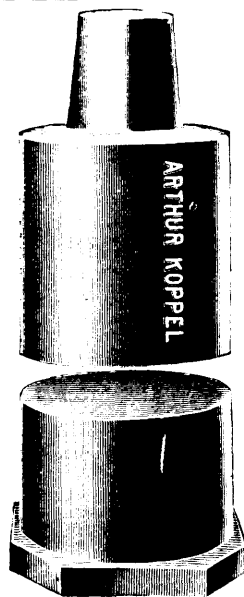
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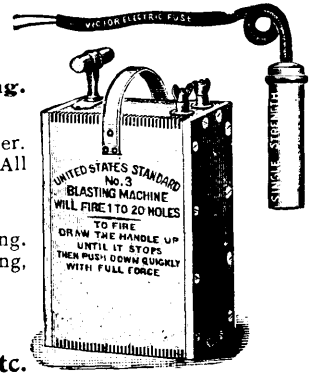
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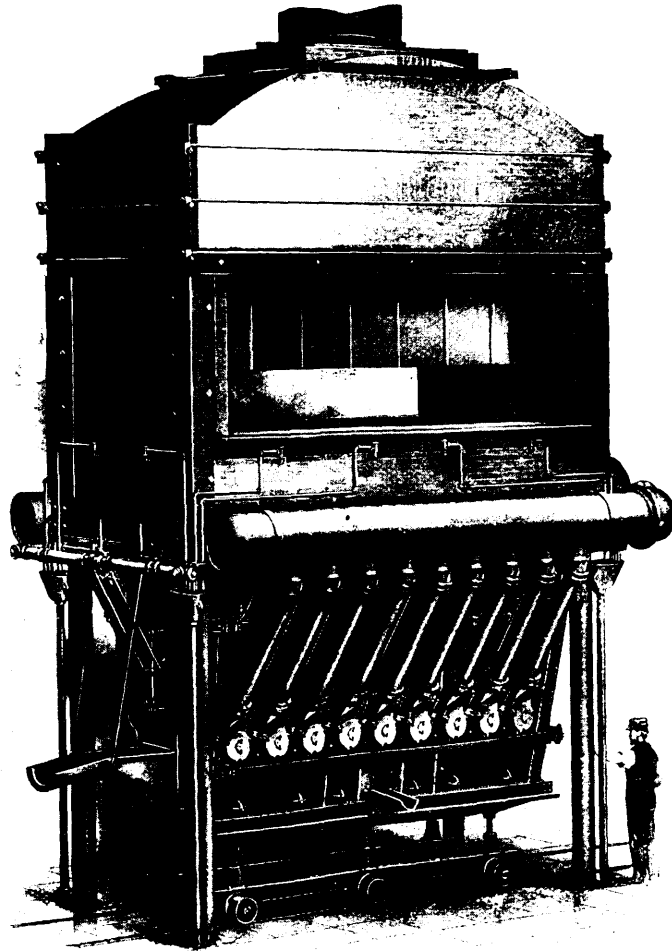
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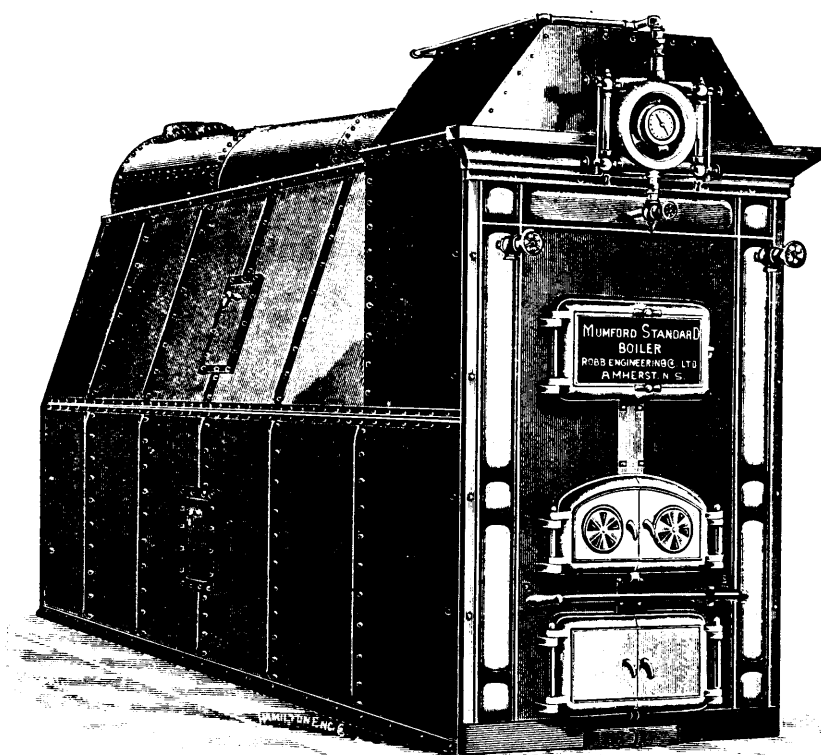
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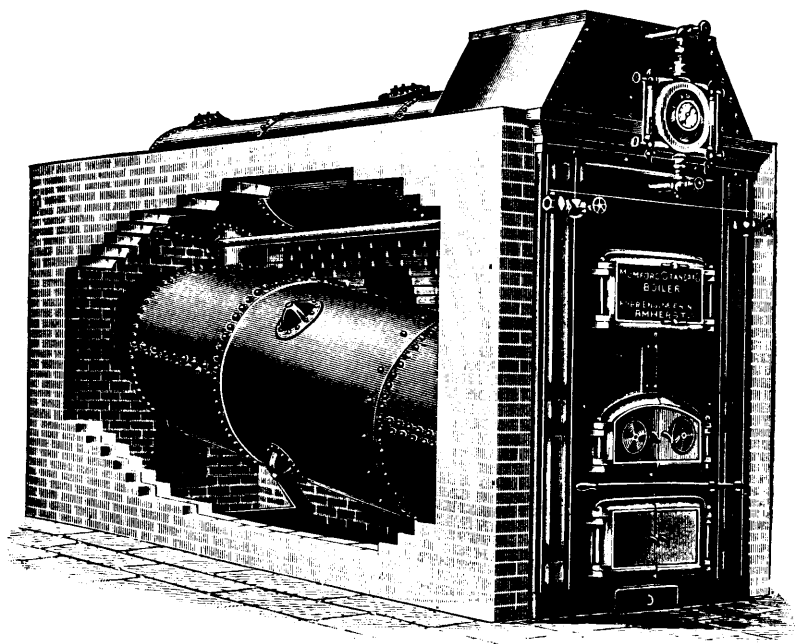
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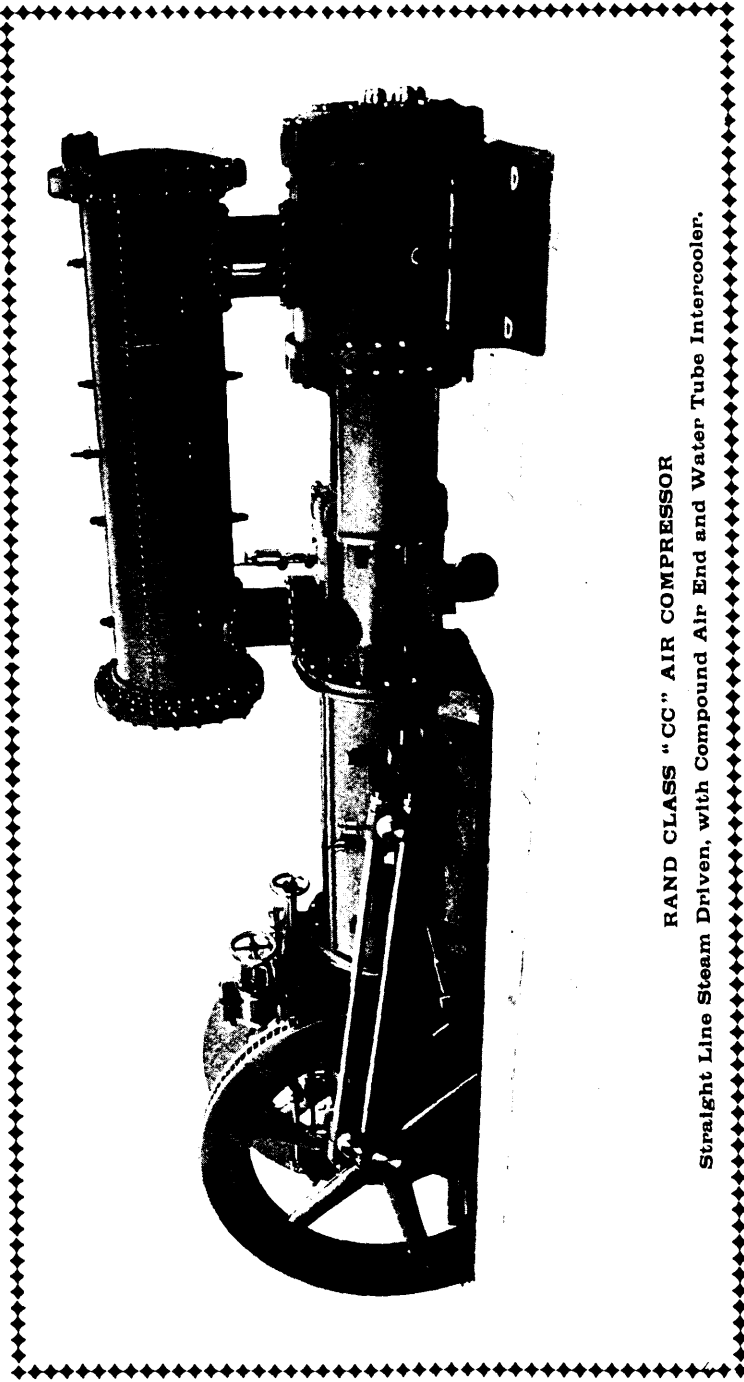
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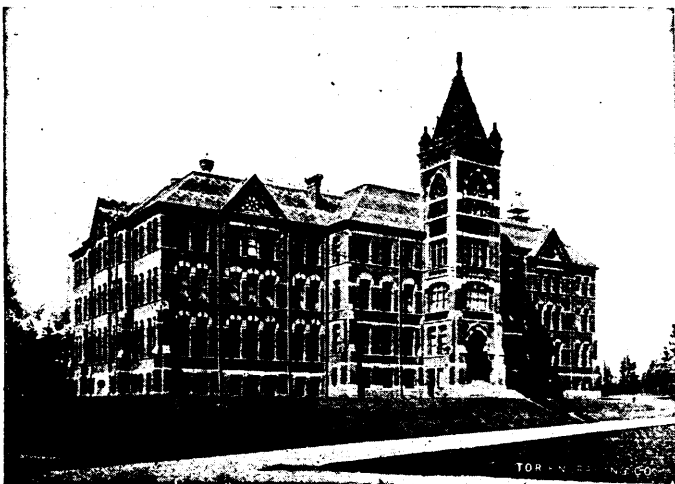
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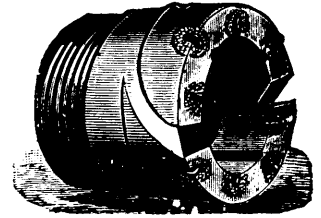
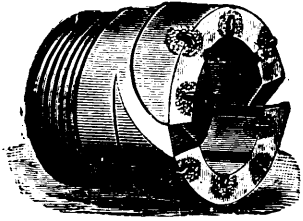
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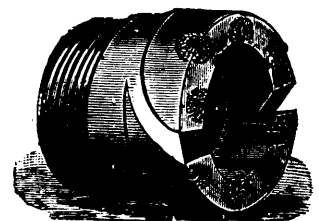
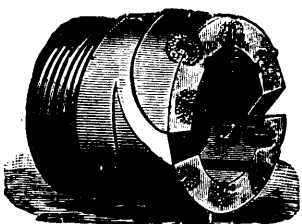
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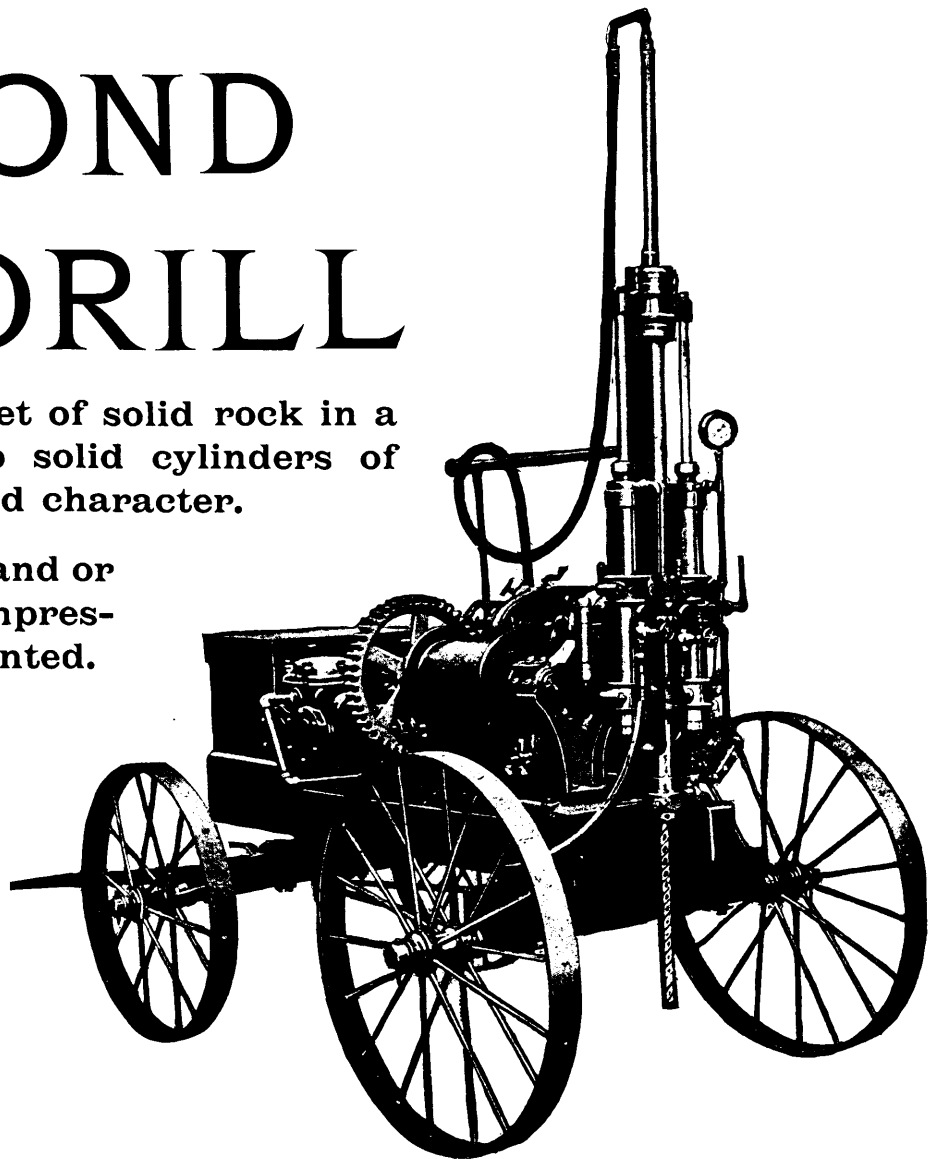
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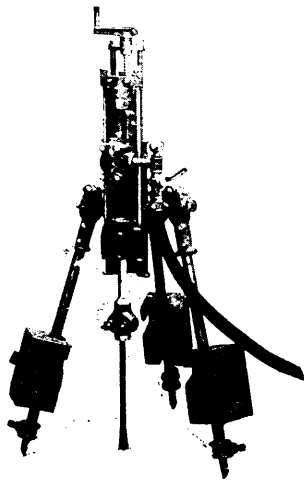
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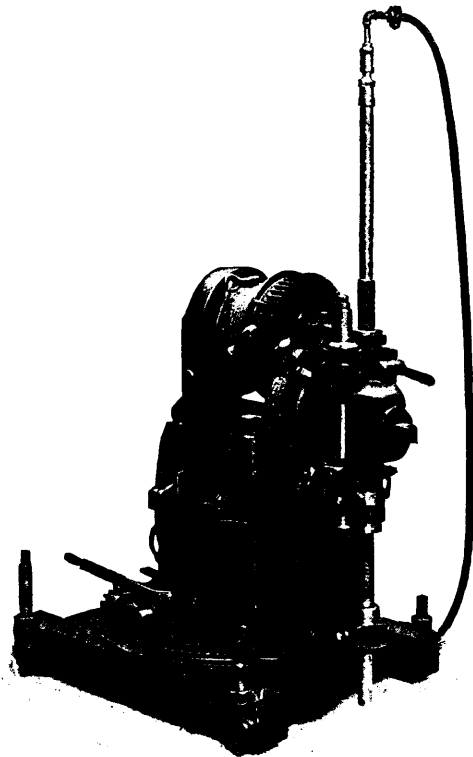
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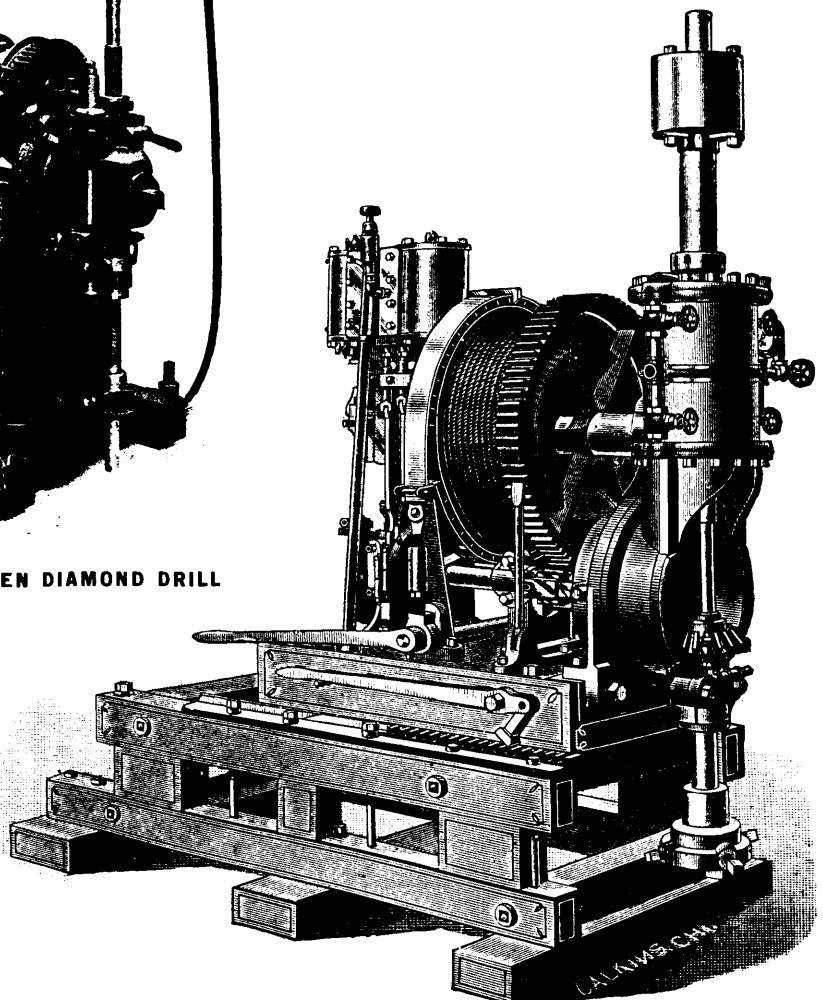
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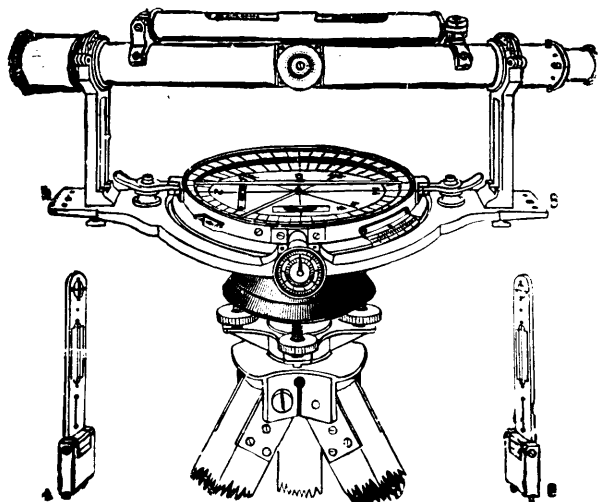
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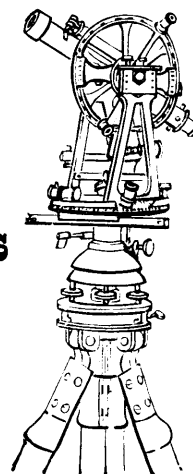
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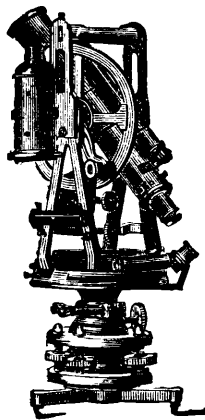
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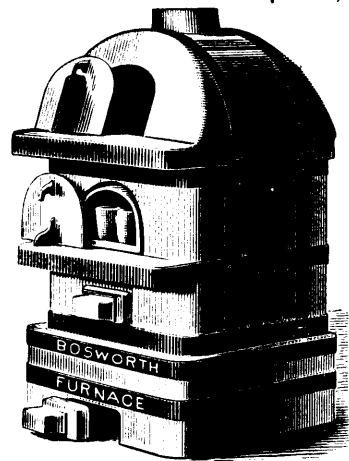
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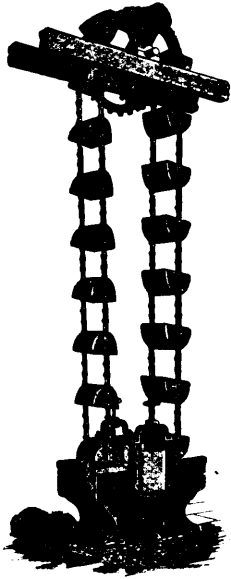
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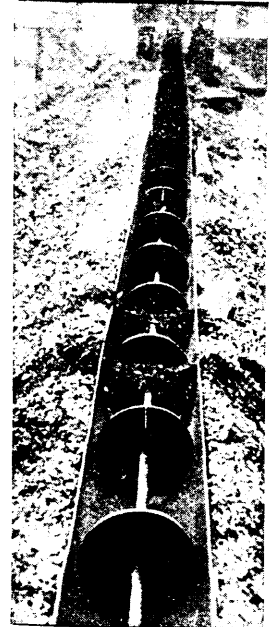


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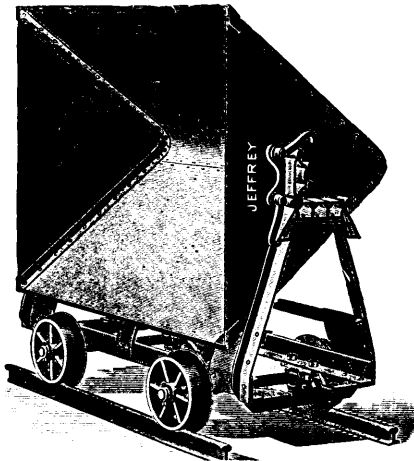
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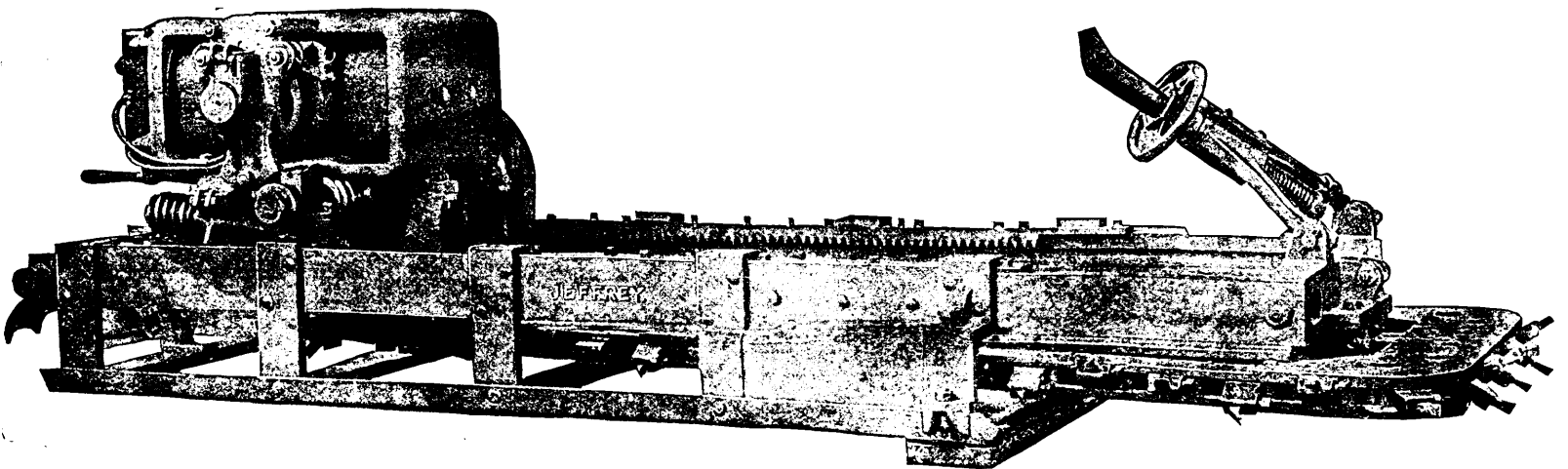


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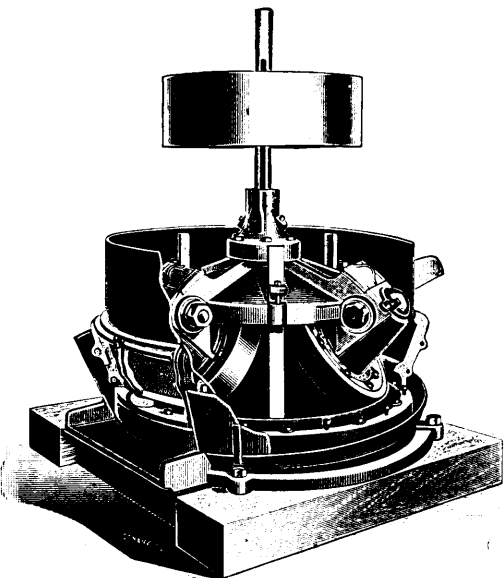
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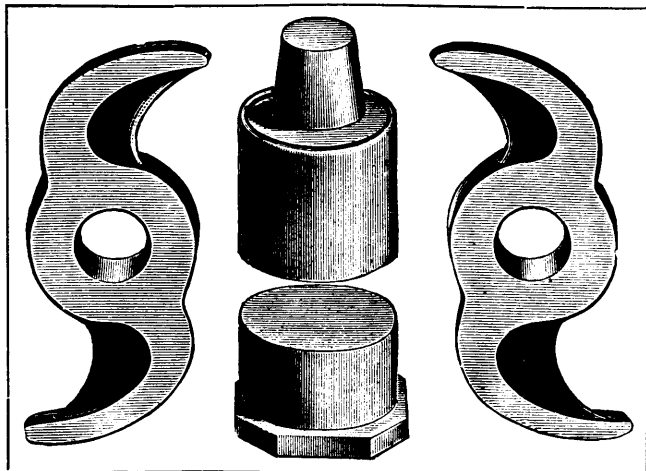
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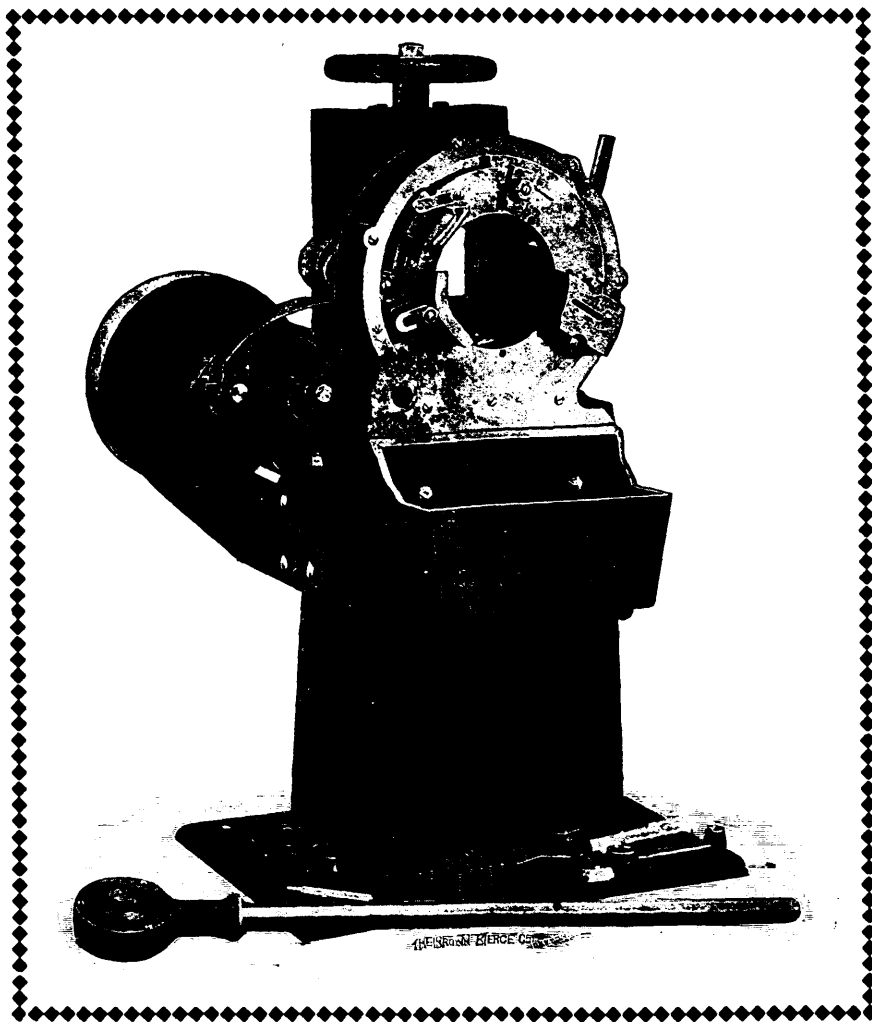
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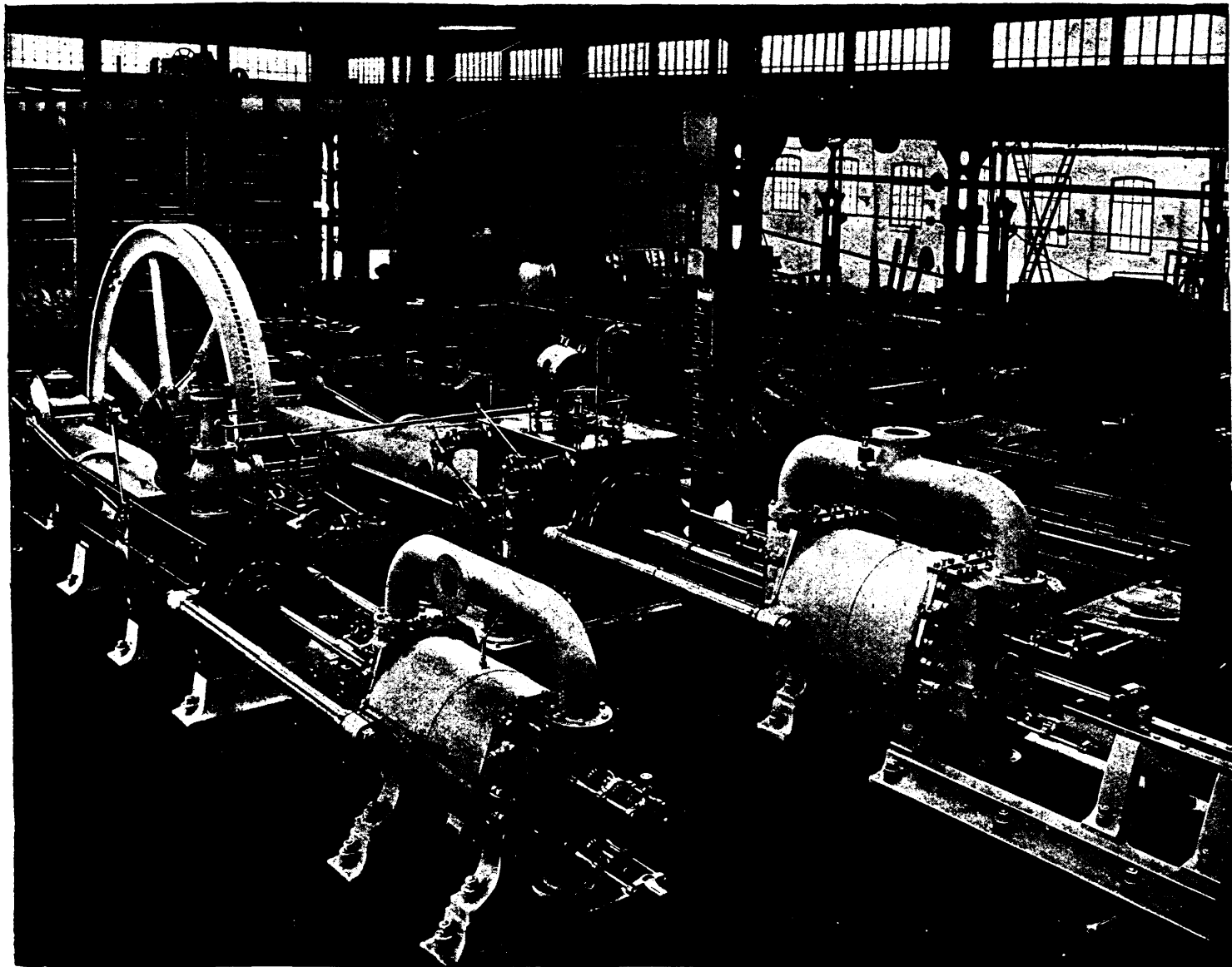
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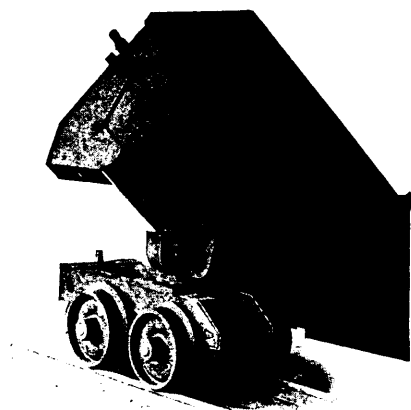
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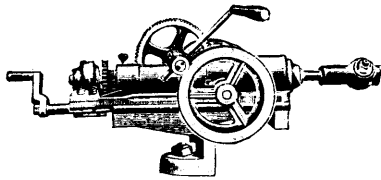
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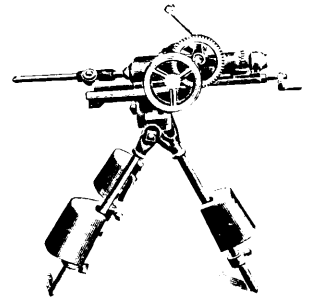


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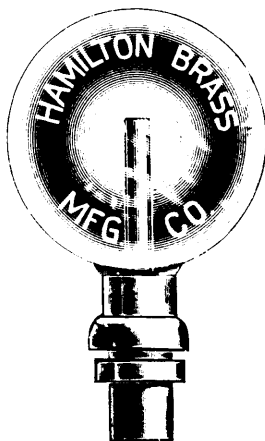
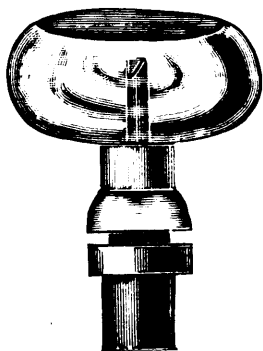
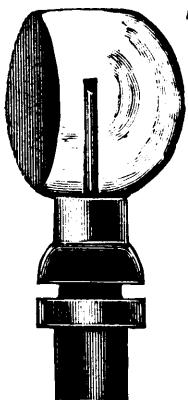
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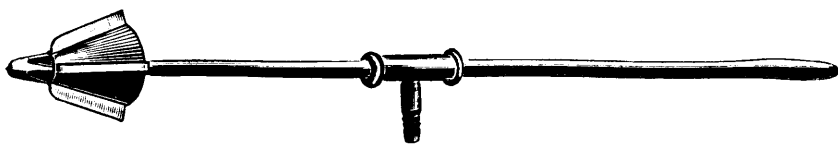
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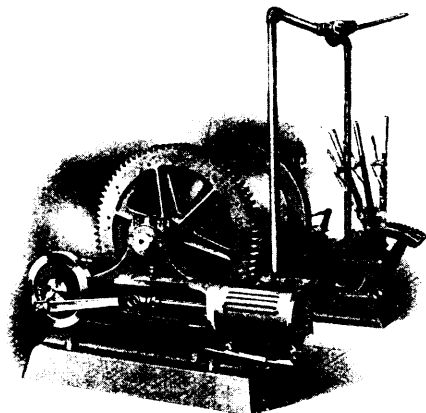
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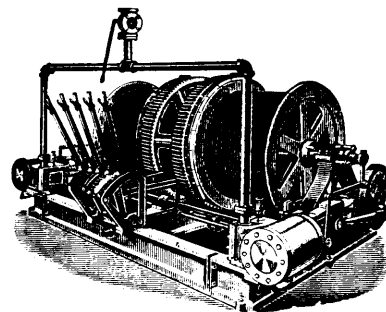
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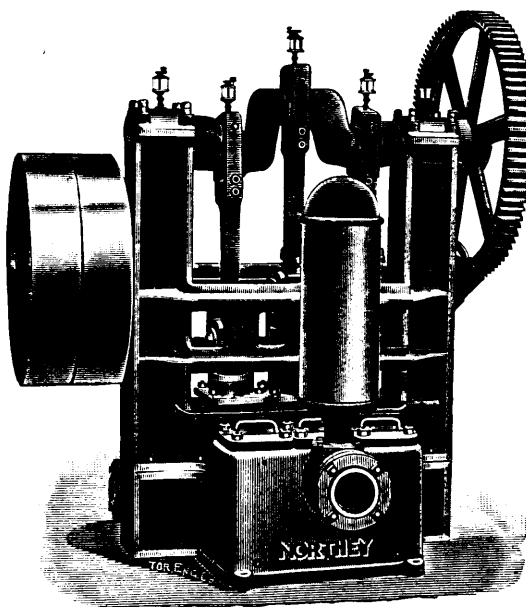
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# THE CANADIAN MINING REVIEW

Established 1882

THE OLDEST AND ONLY OFFICIAL MINING AND ENGINEERING JOURNAL PUBLISHED IN THE DOMINION OF CANADA.

B. T. A. BELL, Editor and Proprietor.  
Secretary, Canadian Mining Institute, etc.

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AUGUST, 1901.

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## Troubles in British Columbia.

The clouds which have hung over Rossland as a centre for several months burst in July with the not unexpected result of a strike on the part of the Rossland Miners' Union. The declared reason for this strike is sympathy with the smelter men at Northport, and for an increase of muckers' wages in Rossland of fifty cents per day. In consequence of the strike something like twelve hundred men were put into idleness, and up to the middle of August over 700 men had left that camp to seek work elsewhere.

It is claimed locally that the strike is purely the work of professional agitators, and that the vote to call out the men was "rail-roaded" through at the July meeting. At this meeting less than one half of the members of the Union were present, and the figures published seem to justify the statement as to the matter being in the hands of a clique; only 258 ballots, out of a total membership of some 700, were cast in favour of the strike. Up to the present time over 700 men have taken their packs and departed for fresh fields, most of the staff of the War Eagle and Centre Star Mines has been dispensed with, and the members have left the camp; the construction of the large addition to the Bonnington Falls power plant has been stopped; the large copper smelting furnace at Trail has had to be blown out, and a period of trade depression and uncertainty has been in full existence now for four or five weeks.

At the time of writing, no attempt for a settlement has been made either by the Union or the mining companies, nor is there any immediate hope of such an attempt. The managers of the large mines have authorized the statement that it is impossible for their companies to grant the advance, or to increase their expenses in any way, in the present condition of their mines. In the B.C. Government Mines Report (reviewed elsewhere), the average gross value of the ore shipments from Rossland in 1900, as figured by the REVIEW, was \$10.72 per ton, that of the LeRoi Mine was \$9.17 per ton, and the shipments from the War Eagle and Centre Star Mines (together) was \$14.80 per ton. From the published reports of the companies named, and from the various statements that have appeared in the B.C. newspapers relative to this strike, it is evident that the actual cost of this ore to the mines is not less than eight dollars, and probably equals \$9.00 per ton, especially if all the costs, such as mining, transportation, smelting, management, marketing, depreciation and taxes are included, as they should be.

In view of these figures and facts, and taking into consideration that it is well known that no large bodies of high-grade ore have been encountered in development work, it is easy to believe that Messrs.

Macdonald and Kirby have stated *nothing but the truth* when they said that the margin for profit now existing would be eliminated if they were to further increase existing expenses. Hopes for the resumption of work then must be confined to the expectation that the Miners' Union will recede from its position and abandon the strike. This view is intensified by remembering that the average value of the shipments from the Le Roi mine in 1900 was \$9.17 per ton, and rumours have been brought east that the 104,000 tons shipped during the first half of the present year have averaged less in value than the shipments for 1900; if such rumours (which the REVIEW does not vouch for) are true, the LeRoi for this year has already lost the small margin of profit it had last year, and the strike may be a blessing in disguise to that company.

At this time, also, an organization called the British Columbia Mining Association has presented a memorial to His Excellency the Governor General in Council, praying for the appointment of a Royal Commission to inquire into the conditions of excessive taxation and oppressive legislation existing in British Columbia, with a view to recommending measures for the relief of the mining industry of the Province. Inquiry at Rossland leads to the belief that this British Columbia Mining Association is the organization known as the British Columbia Mine Owners Association, and if such is the case its public utterances are entitled to very serious consideration.

The memorial is a lengthy document that has appeared in several papers in Eastern Canada, and been commented upon. To very briefly summarize the memorial, it begins the statement of its case by saying that the white population of the country before the mining excitement of the last decade amounted to 65,000 people; that in the year 1900 this white population had reached the number of 110,000. It then goes on to say that the prospectors of the Province have nearly all disappeared—"The flow of capital into the Province has been practically cut off, the metallic production is at present decreasing; numbers of producing mines have closed down, and those operating, with but few exceptions, have ceased to pay dividends." Commenting on this, it is fitting to observe that, during the period referred to in this memorial, the metallic production of the Province has increased from less than \$600,000 a year to over \$11,300,000 a year, a growth which does not strike the REVIEW as "decreasing" or at all discouraging. The statement that the prospectors have disappeared may be true of inland districts, but certainly is not true of the coast country, nor of the northern sections of British Columbia. The figures that we have just quoted give the emphatic lie to the statement that the metallic production is decreasing. The report of the Provincial Mineralogist for 1900 shows a distinct increase of over three millions in the metallic production for the year. This increase is equal to 37%.

The memorial says this decline or "blighting of the industry is not due entirely to natural causes, but mainly to unwise legislation"; at the same time admitting that the industry of metal mining has suffered, amongst other causes, from "The ordinary elements of chance, over-valuation of prospective mines, stock swindles, bad management, etc., etc."

That the present condition of the industry in *Rossland* is retrograding, is undeniable; that this is due to legislation, wise or unwise, is very debateable. We do not fancy that the Association will argue that legislation at Victoria is responsible for the Miners' Union's existence, nor for the decreasing grade and uncertain quantities of *Rossland* ore. And, in fairness, we must point out that a study of the Minister of Mines' Report does not justify any statement that the mining industry is retrograding in other camps throughout the Province. The legislature cannot be held responsible for the depression in the silver-lead mines. While admitting the difficulties under which mining ventures have labored in British Columbia the REVIEW cannot see that they are due to any causes which are legitimately within the jurisdiction of the Dominion Government. We have no desire to approve of the eight-hour law, nor to minimise the effects that have resulted from that law, neither do we desire to uphold in any way the burdensome 2% tax on output which is oppressive to many of the mines; but we do desire distinctly to record the opinion that the rectification of these matters is necessarily within the sphere of the Province itself, and not to be supplied by the Dominion Government in any special form or manner. The Province itself, and the people in it, are to blame for any legislation which has been unwise, and also for "the over-valuation, stock swindles, and bad management" complained of in the memorial.

The columns of the REVIEW, during the past four or five years, have forecast in a measure the conditions which now obtain in some of the older camps. By those competent to observe, and deduce conclusions, the operation of the natural law of cause and effect could have been seen as clearly years ago as it now is plainly felt, though it has been aided by the labor agitator and his followers.

The vague stories of fabulous richness have run their course and died a natural death; values have been ruthlessly cut down with experience; credulous (because inexperienced) capitalists, and the yet more credulous public, have been the prey of promoters and stock schemers, and loss of confidence in the mines of British Columbia was inevitable. So far as the Canadian capitalist is concerned, this loss of confidence has begotten violent condemnation of everything and everybody connected with mines, and the reaction is as grossly absurd as was the enthusiasm of three years ago; the foreign capitalist, however, who is no novice, has only been waiting for the shaking up British Columbia mines are now experiencing, knowing that when matters settle down values will be on an approximately equitable basis, and that mining can then be conducted in the same way as any other business.

No Royal Commission is needed, nor should it be issued. Hasty legislation at Victoria, burdensome taxes, and labor union troubles call for no outside investigation, but for strong and united Provincial efforts for their rectification. The Federal Government has done its part in giving such relief (in bounties) as was asked, but it cannot change the customs tariff for the benefit of any one particular Province, or any particular class of citizens. It is for the inhabitants of British Columbia to help themselves and to take such action as will rehabilitate that Province in the favor of capitalists both at home and abroad.

The fourth volume of the Journal of Proceedings of the Canadian Mining Institute for 1901 was issued to the members on the 22nd instant. This volume is the largest yet published since the organization of the Institute.

### Mining in Nova Scotia.

During the past six months mining operations have been carried on vigorously in Nova Scotia. In Cape Breton, the Dominion Coal Co., have practically bottomed their big shaft, and next season its production will be an important item. The development of No. 3 colliery in the Caledonia seam has been steadily pushed. As the coal in No. 4 sank in an underlying seam proved too thin to work, the mine was closed. The improvements effected during the past year in the plant of this company have resulted in increased outputs from all of their principal mines. The amounts of coal supplied to the Dominion Iron and Steel Company are steadily increasing, as additional furnaces are blown in.

At the Old Sydney Mines, the Nova Scotia Steel and Coal Company are working steadily both at their ovens and in the pit. Preparations are being made to open up the Northern district which as yet is untouched. This will be reached by a branch railway from their present line. Boring operations are being continued by Mr. Roberts in the rear of North Sydney, and by Senator McKeen near Cow Bay. The results which are not yet made public are believed to be fairly encouraging.

At Mabou, some exploratory work has been done with a view of preparing for the extension of the workings under the sea. The Port Hood Coal Company are making good progress, and claim to have improved their shipping facilities so that good sized cargoes can be loaded without any difficulty.

At Broad Cove, the work of development by the Inverness and Richmond Railway and Collieries Company is being gradually extended. This company are now connecting their road with the Government system by a branch from Port Hawkesbury to Port Hastings.

In Pictou County the Nova Scotia Steel and Coal Company are opening a seam to the East of New Glasgow, from which they expect to take out about 200 tons of coal a day to supply their generators at Trenton. Otherwise, mining is rather quiet in the Pictou district. A good deal of interest is being taken in the prospect of finding coal beneath the overlying measures between New Glasgow and Pictou, and arrangements are being made for the services of one of the Government drills.

In Cumberland County work has been quiet during the past few weeks. The purchase of a large amount of coal by the Minister of Railways last spring has anticipated the ordinary supplies furnished by the mainland collieries. As, however, it is stated that the railway will require an increased amount of coal, this will probably be made up in the fall. The total sales for the six months amount to about a million and a half tons as compared with one million three hundred and fifty thousand tons during the same period last year.

The Dominion Iron and Steel Company have now two furnaces in blast, and are arranging to start the third in a few days. Some little difficulties incidental to the inauguration of furnaces under new conditions have been met, and are being overcome. Presumably they are due to the proper relationships of the fuel, ores and fluxes not yet being fully made out. The erection of steel works, plate and other mills is being hastened as much as possible, and every effort is being made to overcome the delays which have arisen in getting this concern in full working order.

The Nova Scotia Steel and Coal Company have continued working in Pictou County. A Government drill is at work now in the Whycomagh iron deposits, in the hope that it will prove a cheaper and more prompt method of tracing the various deposits.

At Torbrook, in Annapolis County, the borings of the Government Diamond drill conducted by Messrs. Pearson and Brookfield

have demonstrated the existence of an iron ore field similar in quality to that worked in Newfoundland, and of enormous extent. So large does the amount of iron ore appear in this district, that the claim seems well founded that it is one of the largest in the world. Situated within 25 miles of tidewater, and on the line of the Central Railway it is unusually well situated for the export business.

There is little to report about gold mining. The returns as far as received would indicate that the output this year should be in the vicinity of 40,000 ounces, a material increase over the year 1900. The various mines which have been referred to in our columns have continued to work regularly. The approaching development of the Dolliver Mountain low grade deposits, which are a continuation of the well known Richardson reefs, leads to the hope that in the near future another large and prominent producer will be added to the list of Nova Scotia mines. Much interest has been taken in the discovery of extensive deposits of gold bearing quartz in the Nictaux district close to the iron fields.

The demand for building stone, plaster, limestone and bricks continues unabated, and all the properties handling these products are working steadily.

#### The Resignation of Professor De Kalb.

We are sorry that by the resignation of Professor De Kalb, professor of Mining and Metallurgy in the School of Mining, Kingston, Ontario, is to lose the services of one who has done much to assist in the steady and healthy growth of mining in that province during the past five or six years. During that period Professor De Kalb has devoted himself to his duties in the School of Mining with such energy and love of his work as to leave a lasting impress upon that vigorous institution. The mining laboratory at the School of Mining is one of the best equipped on the continent, and we understand that a large part of this equipment has been secured by Professor De Kalb among his personal friends in Canada and the United States. In addition to his duties as professor of Mining and Metallurgy, he has also acted as Inspector of Mines for Ontario. This office he also now resigns, after getting to himself the credit of making mine inspection in Ontario a reality. His wide experience in mining operations enabled him to be of great service, not only in protecting miners from the dangers of careless or incompetent management, but in giving valuable suggestions as to mining methods. It will be difficult to replace Professor De Kalb in the two offices which are now vacant. We wish him every success in the work of consulting mining engineer, which he now resumes.

#### Mining Progress in British Columbia.

The report of the Minister of Mines for British Columbia for 1900 is fully equal to its predecessors in both form and value, and is particularly interesting at the present time in view of the Memorial recently addressed to the Governor-General-in-Council by the British Columbia Mining Association, is noticed on another page of this issue. The total gross value of the minerals produced in British Columbia in 1900 was \$16,344,157, the value for 1899 was \$12,393,131, showing an increase for 1900 of \$3,951,020, or 32 per cent.

Nearly one half of this large increase comes from the abnormal production of lead, which amounted to 41,496,183 lbs. in excess of the production for 1899, being 63,358,621 lbs. against 21,862,436 lbs. The value of the increase is given as \$1,813,017. The production of silver was 3,958,175 ozs., an increase of 1,018,562 ozs. or 39 per cent.

more than the production for 1899, and 3 per cent. less than the yield for 1898; the increase was valued at \$645,492

Gold won from placer mining decreased \$66,000, but that obtained from vein mines increased \$595,000, making a net increase of \$529,632 or 12 $\frac{6}{10}$  per cent. To this increase the Cariboo District contributed \$303,000 (largely from the successful year of the Consolidated Cariboo Hydraulic Company), Nelson Division of West Kootenay added \$311,000 (chiefly the product of the Ymir and Athabasca mines), Trail Creek (Rossland) showed a small increase of \$178,000 and the Boundary Creek country \$145,000 from the gold contained in the ores smelted there; from the total of this increase must be taken the very large decrease in the Cassiar and Atlin Lake districts which amounted to \$350,000.

Copper shows an increased output of 2,274,489 lbs. of a value of \$263,836, or 29 $\frac{1}{2}$  per cent. increase in quantity, and 19 $\frac{1}{2}$  per cent. increase in value, over the figures for 1899. The factors accompanying this increase are the most significant in the Mines Report. The amount of metal produced in Boundary Creek from the furnaces started during the year is valued at \$918,325, the Vancouver Island Districts show an increase of \$240,582; at Rossland the production declined in amount the sum of \$661,000 and in Nelson Division (due to the temporary closing down of the Hall Mines) there was a decrease of \$234,000.

Of the total production for 1900 Yale District (Boundary Creek) produced 5,672,177 lbs., the Coast District 2,193,962 lbs and Trail Creek (Rossland) 2,071,865 lbs.; in 1899 Rossland produced 5,693,889 lbs., which was 74 per cent. of the total copper produced that year in British Columbia, but for 1900 the percentage amounts to only 20; Rossland's production for 1900 is 36 $\frac{4}{10}$  per cent. of the copper produced in 1899, so that no longer can Rossland be considered as the principal copper camp of the province, and, upon considering Mr. Robertson's valuable figures contained in his "Notes of Progress," it is difficult to call it a copper camp at all as its values are almost entirely in gold. The average amount of copper in Rossland ores in 1900 was about nine pounds per ton, whereas in 1899 there were 33 lbs. of copper to the ton of ore; the average gold contents were \$10.60 in 1899 and \$12.30 in 1900. The 103,426 tons of ore smelted from the Boundary Creek country during 1900 averaged 54 lbs. of copper and \$3.60 in gold to the ton. The amount of silver contained in the ore is very small, averaging from  $\frac{3}{4}$  of an ounce to 1 ounce to the ton. Another significant item among these figures is the increase of 26 per cent. in the tonnage output from Trail Creek district (some 44,971 tons) with a decrease in total values of \$489,780, making the percentage decrease about 33 per cent., or a fall from \$18.70 in 1899 to \$12.60 per ton in 1900.

In combustibles, coal shows an increase of 133,271 tons, of a value of \$399,813; coke increased some 50,000 tons, of the value of \$254,490. The increase therefore in coal and coke is 184,169 tons and \$654,303, or 16 per cent. over 1899.

The increases (in dollars and cents) with the percentages of the total increase are shown in the following tabulation:—

Lead.....	\$1,813,017	45.9	per cent.	of total increase.
Coal (and Coke).....	654,303	16.6	"	"
Silver.....	645,492	16.3	"	"
Gold.....	529,632	13.4	"	"
Copper.....	263,836	6.6	"	"
Other materials.....	43,340	1.2	"	"
	<u>\$3,951,620</u>	<u>100.0</u>		

The percentage of the total increase credited to lead is noticeable, and is explained by the large production from East Kootenay district, which, in 1900, produced 37,500,000 lbs. more of lead than in 1899, thus accounting for \$1,606,970 of the \$1,813,017 total increase in lead; nearly 90 per cent. of the increase in silver also comes from this dis-

district, \$541,000 of the total increase of \$645,000 being East Kootenay's share. But, while crediting East Kootenay fairly with its part of the large total, one must not forget that the low percentage of silver in the lead is also due to this district. In 1899, taking the production of the whole Province of British Columbia, there was 1 oz. of silver to every 7 $\frac{1}{8}$  pounds of lead; in 1900 there was 1 oz. of silver to every 16 lbs. of lead; but in the district of East Kootenay there was only 1 oz. of silver to every 40 pounds of lead, or, putting it in smelter's language, in 1899 there were about 2 $\frac{1}{8}$  oz. of silver to the unit of lead, in 1900 1 $\frac{1}{4}$  ozs. to the unit of lead, and for the East Kootenay district only  $\frac{1}{2}$  oz. to the unit of lead.

The general result obtained from a study of these figures and of this report is one distinctly favourable to British Columbia. It proves that the mineral industry is progressing in a manner which, if not specially noteworthy, is nevertheless satisfactory, and it renders incomprehensible the pessimistic reports which have emanated from the Province during July and August. A review of a government report is not the proper place in which to discuss these reports or the remedies suggested, but we have alluded to them elsewhere.

The prohibition of the entrance of silver-lead ores into the United States, which happened at the beginning of the year and was solely caused by the monopoly called "The American Smelting & Refining Company," has created a tremendous depression in silver-lead circles and properties, which is not likely to be removed this year. Notwithstanding, there is every probability of a larger increase of gold production and a substantial increase in copper for 1901.

Notable developments are also making in the coal and iron interests of the province. The discovery and exploitation of deposits of high grade hematite along the line of the Crow's Nest Railway will soon lead to a larger consumption of both coal and coke. In short, the only danger that threatens the steady advance in mining in British Columbia are of man's invention and not of nature's placing.

### Mining Legislation in B.C.

The following measures affecting mining were passed by the Legislative Assembly for the Province of British Columbia during the session 1901:—

#### INSPECTION OF THE METALLIFEROUS MINES.

Bill No. 28, an Act to amend the 'Inspection of Metalliferous Mines Act,' and amending Act provides for the appointment of an inspector or inspectors of metalliferous mines, who shall have had at least seven years practical experience. The provincial mineralogist shall have the powers and may exercise the functions conferred on an inspector of metalliferous mines by the Act.

The Act further provides that accidents must be reported forthwith to the Minister of Mines and to the inspector of the district in which the mines is situated. A monthly return is required to be made to the Department of Mines, setting forth the name of the mine, its extent, the name of the company or person operating it, the quantity of ore treated and any other particulars deemed necessary by the Minister of Mines. The Mine Recorder is to be notified of the shipping or the treating of ore from or at any mine.

The Act includes a new code of mine signals, to be known as the British Columbia Code of Mine Signals.

It is further provided that from and after the 1st of January, 1902, no person shall be allowed to operate for more than 8 hours in every 24 hours any first-motion or direct acting hoisting engine, any geared or indirect-acting hoisting engine at any mine employing 15 or more men underground, where the duties of a fireman are performed by the engineer in charge; nor shall any stationary engineer be allowed to

operate a stationary engine developing fifty or more horse power where such engineer has charge or control of a boiler or boilers in addition to other duties performed by him. This Act shall not, however, apply to such steam plants as are in continuous operation or as are operated 20 or more hours in the 24 hours.

#### INSPECTION OF STEAM BOILERS

Bill No. 31, an Act respecting the 'Inspection of Steam Boilers and Engines and the Examination and Licensing of Engineers in charge of Steam Boilers and Engines,' includes within its scope all steam boilers operated in the Province of British Columbia, excepting railway locomotives on railways under the supervision of the Dominion of Canada; boilers subject to inspection under the Dominion Steamboat Inspection Act and boilers with a capacity of two-horse power or under.

It is provided that the Lieutenant-Governor in Council may constitute the Province of British Columbia into a Steam Boiler Inspection District or as many districts as he may deem proper. The Act provides for the appointment and qualifications of inspectors, who shall form part of a board to be called the Board of Steam Boiler Inspection, for the inspection of boilers, for the imposition of penalties for constructing or operating defective boilers, for the providing of steam gauges, water gauges, try-cocks, blow-off connection, feed water arrangement, brick flues, fusible plugs and other parts of the equipment, and for the qualification and classification of engineers.

Provision is made that the owner of every boiler within the scope of the Act shall pay yearly fees amounting to not more than \$5; these fees to form part of the consolidated revenue of the province.

The Lieutenant-Governor in Council is authorized to make rules and regulations for the inspection of steam boilers and for the examination of persons in charge of same. All rules and regulations made under the authority of this section shall, after publication in the *British Columbia Gazette*, have the same force as if incorporated in the Act. (a)

#### REGULATION OF COAL MINES.

Bill No. 47, an Act to amend the 'Coal Mines Regulation Act,' provides for the addition to that Act of a chapter dealing with the examination of coal miners, fire bosses, overmen and shot lighters. It is provided that no person shall be employed as a coal miner, fire boss, overman or shot lighter in any coal mine who is not in possession of a certificate of competency as such in the form set forth in the Act. Certificates of competency are to be granted by a board of five examiners, to be constituted at each mine. Such boards shall consist of the following persons: (a) One appointed by the Lieutenant-Governor in Council; (b) two to be appointed by the owners or managers of the mine; and (c) two coal miners actually working in the mine and who shall have at least three years' experience as working miners, and after the going into force of this Act, possessed of the certificate of competency as such. Such coal miners shall be elected by the coal miners actually working in a mine. It is provided that the two coal miners who act on the board of examiners for the first year after the coming into force of the Act shall not be required to hold a certificate of competency.

The members of the board are to hold office for one year or until its successors are appointed.

No certificate of competency shall be granted to any coal miner, fire boss, overman or shot lighter who does not satisfy the majority of the board of examiners that he is sufficiently conversant with the English language and with the provisions of the Acts relating to coal mines and rules and regulations made thereunder as to render his employment as such safe. In order to qualify for a certificate a coal miner must have been employed in a coal mine for at least 12 months previous to the date of his application for the certificate; he must have a sufficient knowledge of the methods of coal mining to render him competent to perform the duties appertaining to his employment; and if he is a shot lighter, fire boss or overman in addition to the foregoing,

he must have a good knowledge of the character and effects of explosives and must be fully competent to perform his duties.

The Lieutenant-Governor in Council is authorized to issue from time to time regulations and forms for carrying out the provisions of the Act, such regulations shall, after publication in the *British Columbia Gazette*, have the same effect as if incorporated in the Act.

Every owner, agent or manager of a mine who gives charge of a working place to any person who is not a holder of a certificate of competency, and every person who obtains or seeks to obtain such employment by means of a false or fraudulent certificate shall be guilty of an offence under the act. Every owner, agent or manager of any mine or any person who refuses to allow coal miners to hold a meeting to elect examiners, or who in any way interferes with the working of the Act, is also guilty of an offence under the Act.

The Lieutenant-Governor in Council is empowered to authorize the payment of all necessary expenses for carrying out the provisions of the Act from the consolidated revenue of the province.

#### STORING OF EXPLOSIVES.

Bill No. 100, an Act to amend the 'Explosives Storage Act,' does away with all express exemptions from the operation of the Act, excepting the exemption respecting magazines or stores for the naval or military force. The exemptions heretofore included magazines in connection with coal mines and railways. It is provided that the cases in which powder magazines may be kept within the town or city shall include mines actually existing or become established within any city or town or within two miles of the limits thereof. In such cases, however, the magazine must not be within one-quarter of a mile of any inhabited house, and, in case of any dwelling being subsequently built within that distance, such must be made absolutely safe by natural mountains or hills or by artificial mounds of sufficient height and thickness, and the inspector of mines for the district shall first certify that such magazines comply with the requirements. The Lieutenant-Governor in Council may from time to time grant such special licenses for the erection and maintenance of powder magazines otherwise prohibited by the Act at such places and upon such conditions as shall appear expedient.

#### Conciliation in Nova Scotia.

On June 25th a settlement of the differences between the miners in the employ of the Nova Scotia Steel and Coal Co. and that company was effected at Sydney Mines under the Canadian Conciliation Act. Some time ago the Provincial Workmen's Association, which is composed of miners in many of the most important centres of Nova Scotia, made a demand on the employers of local mines for an increase of 22 per cent in the rate of wages paid to miners, to take effect in part in January and May of the present year. Also an increase of 50 cents per day to mechanics and 25 cents a day to ordinary labour employed about the mines. This demand was based upon the increased price of coal, which had been considerable during the previous year. In some of the mines this demand was conceded in part by employers without any serious conflict arising. In others the demands were met or compromised only after a strike had been inaugurated. In the case of the men belonging to the Dominion Iron and Steel Co., of Sydney, the matter was submitted to arbitration under the provisions made in the Miners' Arbitration Act of the province. A board of arbitrators was appointed and evidence given before this board by both the employers and the men. The board rendered its decision on April 25th last, and the decision given was in effect that in view of the position of the company the demands made upon it could not be granted.

The mines of the Nova Scotia Steel and Coal Company are opposite those of the Dominion Iron and Steel Company on the

other side of the Sydney Harbour. At the time at which the employees of the Dominion Iron and Steel Company submitted their cause to arbitration under the previous Act, the employees of the Nova Scotia Steel and Coal Company made an appeal to the Honorable the Minister of Labour for the intervention of the Department of Labour to effect a settlement between the company and themselves under the Conciliation Act of the Dominion. In their communication to the Minister of Labour the employees pointed out the nature of their demands and stated that they were anxious to effect a settlement of these without the necessity of having recourse to a strike and suggesting that the minister should lend the friendly offices of the department to bring about an amicable adjustment of their claims. The communication was signed by a committee of the employees of the mines of the company, some 700 in all.

On receipt of the communication from the miners' committee, the company was informed of the contents of the communication, and the letter sent to the company contained the statement that the Honorable the Acting Minister of Labor was pleased to offer the services of his department in order to prevent a possible serious industrial dispute between the company and its employees and to effect the bringing about of a settlement in regard to the rates of wages in question which might be satisfactory to both parties, and the company was asked to signify its willingness as to the acceptance of the friendly offices of the department in the matter. After a brief consideration of the letter of the department, with which was enclosed a copy of the Conciliation Act, the company replied that it was agreeable to the intervention of the department under the Act.

As soon as a date convenient for a conference of all parties was arranged, Mr. King, the Deputy-Minister of Labor, left Ottawa to effect such settlement as might be possible after conference with the interested parties.

Mr. King arrived at North Sydney on the 21st, and on the day following met a committee of the miners at Sydney Mines and had their claims submitted to him and explained by the committee. He left on the following day for New Glasgow, where the head office of the company was located, and met there the managing director, the manager and the general superintendent of the company. These gentlemen reviewed briefly the position of the company in regard to the demands of the men and submitted evidence in support of their contention. It was shown that considerable advances had been made to a number of mechanics since the beginning of the year, some of which were in excess and others equivalent to the demands being made. Attention was also drawn to advances in the nature bonuses which had been made to the miners after the time at which their demands had been preferred.

The company maintained that the Dominion Iron and Steel Company, which had its mines in the near vicinity, was a keen competitor, and that the arguments which weighed in favour of the contentions of that company at the time at which the demands of its employees were submitted to arbitration under the Provincial Act, applied to a degree in its own case. It was then proposed that the rates of wages obtaining in the mines of the Dominion Iron and Steel Company should be made a basis for the rates to be paid to the employees of the Nova Scotia Company. The managers agreed to this proposition as a basis of settlement, and Mr. Fraser, left New Glasgow with the deputy-minister to discuss the proposal with a committee of the men at Sydney Mines. The company's proposition was then presented by the deputy-minister to the men's committee, who accepted it as entirely satisfactory. A question was raised as to the allowing of the payment of the amount due as a bonus in case in cases where men had worked less than the specified number of days for which the company had required work before allowing payment of the



bonus. It was argued by the men that where men worked less than twenty days in the mine they could not under the existing arrangement claim a bonus on any part of the work performed during any period less than the twenty days, notwithstanding the fact that absence from the mine during a part of the time might have been due to unavoidable causes. The company agreed to remedy this by making a provision that where satisfactory evidence was produced to show that a miner had been absent from work through causes over which he had no control, as, for example, sickness or other reasonable cause, he should be entitled to the amount of the bonus on so much of the coal as had been mined during the time at which he was employed in the mine.

A comparison was made by the deputy-minister from the books of the company of the rates being paid to the employees of the two companies, and, where obvious differences were pointed out, the company thereupon agreed to raise their rate in accordance with their previous agreement. As to the other rates, it was provided that these should be adjusted by the new resident manager, who at that time was the assistant manager at the mines of the Dominion Iron and Steel Company, and who on the week following was to be resident manager of the Nova Scotia Company's mines.

To secure the satisfactory carrying out of this agreement, and to prevent the possibility of future differences in regard to the same assuming serious proportions or giving rise to a strike or lock-out, it was agreed by both parties that the resident manager should at all times be prepared to meet a committee of the men to discuss with them any matters relating to the condition of their employment. If the conference with the resident manager did not afford a satisfactory explanation or settlement of the differences, the men's committee were to meet the general manager of the company in conference with the resident manager. In the event of a difference still existing, the point of difference or the question in dispute was to be referred to arbitration. Three arbitrators were to be appointed, one to be chosen by the employees, a second by the company, and the third by joint agreement of the two representatives already chosen, or, failing an agreement on their part as to the third arbitrator, the latter to be appointed by the Chief Justice of the Province of Nova Scotia. To prevent unnecessary recourse to arbitration and to secure as much fair play to each side as possible, it was agreed that the party against which the decision of the court might be made should pay the costs of the arbitration.

The nature and the terms of the settlement having been fully explained and concurred in by each of the parties separately, a joint conference of the representatives of the company and of the men was held, at which the whole matter was reviewed by the deputy minister in the presence of both and there agreed to. The new resident manager was also given his instructions in accordance with the terms of the agreement by the general superintendent of the company in the presence of the deputy-minister.

In the effecting of this settlement the task of the representative of the Department of Labor was a comparatively easy and pleasant one, owing to the evident disposition on the part of the employees to come to a settlement on a fair basis and a no less evident desire on the part of the employers to meet their employees in a friendly manner and to deal fairly with them. Neither party were desirous to have recourse to arbitration if a settlement could be effected without, although each had expressed a willingness to so submit the matters in dispute if necessary, and it was doubtless owing to the latter disposition that a settlement, through conciliation alone, was so speedily brought about.

The *B.C. Mining Review*—a sheet published in London—gravely informs its readers that a "ledge of mica thirty feet in thickness has been uncovered on the Columbia River." Rubbish like this makes old-time mica miners blink.

## EN PASSANT.

Judging from the returns already received at the Mines Office, the gold output for Nova Scotia for the fiscal year which ends on 30th next month, promises to be the largest in the history of that industry. This field, as we have repeatedly pointed out in these columns, is deserving far greater attention than it has hitherto received from outside capitalists.

From this office there was issued on 15th instant another volume of the Canadian Mining Manual and Mining Companies' Year Book, being the eleventh annual issue of this standard work of reference. The volume contains a mass of statistical and other data respecting the mining industries of every section of Canada and very full and authentic details of the organization and operations of the collieries, blast furnaces, metal mines and other mining enterprises. A new feature which will especially commend itself to buyers of ores and minerals will be found in the List of Producers, classified according to industries. Almost the entire issue having, as usual, been sold on subscription in advance of publication, only a few copies of the edition for 1901 are on sale. The work will commend itself to everyone desiring a handy and serviceable reference book to Canadian mining enterprise.

Mr. Henry S. Poole, M.A., A.R.S.M., who lately severed his long connection as manager of the Acadia Coal Co., has been for some time engaged in an examination of the coal measures of the Province of New Brunswick, and will advise the Government as to the most desir-



able points for carrying on boring operations. We are indebted to Mr. Poole for the unique photo reproduced in this issue of an actual working coal mine at Grand Lake. The motive power, a horse, inside in the building, is not shown.

The feature of our next REVIEW will be an excellent sketch of the "History of Mining in Newfoundland" from the pen of Mr. J. P. Howley, F.G.S., Government Geologist. Mr. Howley's paper will be generously illustrated with a series of handsome photos of the coal, iron, copper and other mines for which the Island is famous.

The London & B.C. Goldfields, Limited.—one of the few English syndicates operating in Canada, whose affairs have been distinguished by shrewd business administration—held its annual meeting in London on 17th instant. An excerpt from the Directors report, reviewing the work done during the year by the Ymir, Whitewater, Enterprise, Ruth, and other subsidiary ventures of which it is the parent corporation, is given in another portion of this REVIEW. As it was found impossible owing to the dullness of the market to realize upon the Company's share assets in these companies, except at a sacrifice, the cash profit on

shares sold amounted to only £9,517 18s. 9d. which, after meeting general administration and other expenditures, gave a net balance of £3,012 19s. 10d. The policy adopted by the Ymir Company in putting its large profit into the mine instead of distributing same as dividends also had an unfavorable effect upon the profit and loss account, as otherwise the company would have been entitled to some £12,000 from that source alone, which with the balance of £3,012 19s. 10d. would have been sufficient for a 10 per cent. cash dividend on the capital. It is proposed to pay one shilling per share as an interim dividend for the current year.

The Department of Mines, Halifax, is to be congratulated on the issue this month of a very handily arranged brochure dealing with the mineral resources of Nova Scotia. Dr. Gilpin's latest contribution to the mining literature of Nova Scotia will be appreciated by all who take an interest in the welfare and progress of the great mining enterprises down by the Sea.

Gold dredging on the Saskatchewan gives promise of becoming at no distant date an important acquisition to the successful mining industries of the country. Several dredges of an antiquated type have been at work for several seasons and notwithstanding their many disabilities have earned excellent returns to their owners. These have lately been supplemented by a number of dredges of modern design and equipment, and orders for others are under way. Mr. Isaac Cowie, a respected citizen of Edmonton and one of the old timers on the river, gives, in a recent pamphlet, some interesting particulars of the work now going on. He says: "Near Big Island, about 13 miles up stream from Edmonton, are situated the claims of the "Star" and "Loveland" companies. The Star dredge operated successfully and profitably during two past seasons, until carried away by an unprecedented flood in 1899. It is said to be the intention of this company to resume work with a dredge of large capacity, as soon as the expected success of the large new dredges of the Saskatchewan and the Alberta companies may enable them to procure the further capital required to operate on an adequately large scale. Their old dredge had a 12 h. p. engine, was operated by three men and a boy, and won from \$25 to \$40 a day. The average amount saved out of one cubic yard of gravel, weighing 3,000 lbs., was 40 cents, and besides this much fine gold was known to escape their imperfect appliances. The Loveland dredge is of larger capacity, and is operated by two separate 20 h. p. engines. It has been in use during 1899, 1900 and the present season. Their ground appears to be rich enough to be profitably worked by a dipper dredge, and their chief trouble was with the gold saving apparatus. This, which caused much loss of time, was arranged to their satisfaction in 1900. Before that, in 1899, they sold locally \$4,000 worth of gold, and probably exported some to the United States. After allowing liberally for their running expenses, \$2,000 of the \$4,000 may be supposed to have gone to the shareholders one way or another. Great expectations were formed of the large "Otter" dredge of the Saskatchewan Gold and Platinum Proprietary, erected by Mr. A. E. Hogue, partially on the New Zealand model and partially on combinations of his own. It was completed too late in 1898 for a test to be made. In 1899 it was tried, and, while again demonstrating the richness of the river, proved unsuitable wherever departures had been made from the New Zealand system. This costly dredge was consequently condemned by Mr. George Macfarlane, another Australian mining man, who succeeded Mr. Hogue as manager in the fall of 1899. Mr. Macfarlane was, in the winter of 1899-1900, sent by the Proprietary to New Zealand to acquaint himself with the most recent dredging methods there. Upon his return to England he condemned the "Otter" and caused his company to order a sister dredge to that

already ordered by the Alberta Gold Dredging Syndicate, Limited, of London, to be constructed by Messrs. Renshaw & Co., of Stoke-on-Trent, on plans from the New Zealand Government's blue book procured and sent by me to the Alberta company. During the season of 1900 the "Otter" was refitted with a new screen and gold saving tables by Mr. Macfarlane, but the new machinery arriving late, the old machinery frequently breaking down and unseasonably bad weather setting in prevented much more being done than to again prove that "the gold is there." A Wilfley concentrator was procured by Mr. Macfarlane and proved, even on the unsteady deck of the "Otter," most serviceable in concentrating the sand from the gold saving tables. The two new dredges are supplied with Robey's condensing engines, giving them 100 h. p. each. Their estimated capacity is 3,000 cubic yards each in 24 hours, with machinery so nearly automatic that three men per shift are expected to handle them. The dredge of the Saskatchewan Proprietary is named the "Minto," that of the Alberta Syndicate the "Alberta," and they are now (May, 1901) expected to be soon at work. The manager of both concerns at Edmonton is at present Mr. F. P. Hobson, who has had two seasons' dredge mining experience on the "Otter." The success of those dredges is anxiously hoped for by everyone interested in Saskatchewan gold mining."

We are glad to note indications that Old Country manufacturers are becoming alive to the value of Canada as an important and rapidly expanding market for mining supplies. For many years the great bulk of the purchasing done by our collieries, mines, mills and smelters, aggregating several millions of dollars yearly, has gone to our skilful and enterprising neighbors, some of whom, found the trade so successful that they have established large works in various parts of the Dominion for the manufacture of special lines of mining machinery. There is, however, no good reason why British manufacturers, who turn out many commodities eminently suited to this market, should not command a very much larger share of our trade. It is true that they are handicapped to some extent by distance, but this we should think would be greatly minimized by their cheaper labour and the lower price they have to pay for material. Canada, with her matchless water power and a market which is rapidly increasing and must expand for many years to come, offers great opportunities for the establishment of branch works to meet the growing requirements of our mineral producers. Already such houses as Walker Bros., of Wigan, Fried Krupp, Germany, Firth & Son, of Sheffield, Brown & Co., Liverpool, Bennett & Son, Cornwall, John Davis & Son, of Derby, and other British manufacturers, have now well established connections on this side. Among the more recent acquisitions we are glad to note that of Hollman Bros., the well known Cornish rock drill makers, who have given an agency to Mr. Roland Machin, of Victoria, while the great and only Hadfield's whose castings, for gold mills, collieries and mines are known the world over, have secured the services of our pushing young friend, Mr. Francis T. Peacock, of Montreal. Mining men benefit from competition. We have lots of room and opportunity for many others from the old sod.

The Province of Ontario is to be congratulated upon the very fine display made of her minerals at the Pan-American. Our correspondent gives in another place his impression of the various collections in this connection, and we are particularly indebted to Mr. Frank. N. Speller, B.A.Sc., superintendent of the exhibit for the fine series of views which accompany this article. In a letter to the REVIEW Mr. Speller says:—"Owing to lack of space and the massive characters and number of our minerals represented, it was found necessary to divide the exhibit, using space on the front verandah and north porch in addition to our 1,200 square ft. allotment inside. The Corundum, Graphite, Nickel-Copper and Concentrating Copper Ores are well shown. The samples run from

six tons down and aggregate about 90 tons of material. Mr. Edison has paid us three visits during the past few days, and was particularly struck with the quality and abundance of our nickel ores and graphite. They are, as you know, the essential parts of his new successful storage battery. So interested did he become that he has started on a tour of the nickel mines with one of his engineers. I mention this as being one of the latest and more direct evidences of the good such a display is likely to do the country. It is certainly hardly possible to estimate the influence and importance of Edison's new system of storage battery, but we have the necessary elements, and it should stimulate those interested in graphite deposits to develop their properties and show what they have. In this respect the owners of the Black Donald Mine, through their enterprise on this occasion, have done much for themselves and for the province at large." In other respects the mineral exhibits from Canada are disappointing, doubtless due to the counter attractions at Glasgow, where the Geological Survey made its principal display.

Just as we go to press we learn of the purchase by a Montreal Syndicate of valuable iron mining lands near Kitchener, East Kootenay, which means much for the future welfare of British Columbia. The purchase consideration was \$80,000 in cash. The property comprises fifteen claims, the vendors being Chas. P. Hill, James D. Sword, F. W. Peters, E. J. Matthews, J. Roderick Robertson and S. M. Brydges. The claims contain a very large body of rich hematite iron ore, varying from 50 to 200 feet wide, and it is the intention of the syndicate, as far as can be learned, to commence the manufacture of steel as soon as the necessary work can be done. That the company had this in view in purchasing the property is apparent from the fact that the ore is much too rich and valuable to be used entirely for fluxing in smelters.

The syndicate is composed of some of Montreal's wealthiest citizens and with such an aggregation undertaking a large industrial enterprise in East Kootenay the future of that district is assured. The iron and steel works will not be erected on a small scale but will involve an expenditure \$1,000,000. Excellent water power can be secured at Kitchener from Goat River. The company thoroughly prospected the ground with diamond drills, having Mr. W. H. Blakemore, formerly of the Dominion Coal Company, in charge of the mining operations. Mr. Blakemore has represented the purchasers in the transaction throughout and put the deal through here. The diamond drilling showed such satisfactory results that the syndicate paid the remaining \$63,000 cash.

So far as the market is concerned for the steel and iron which the syndicate purposes manufacturing it is a very large one and consists of the entire Pacific slope, practically from Cape Horn to Behring Sea, therefore, there will be ready sale for the products of the furnaces at good prices. There are only a couple of furnaces, and they do not cut much figure so far as their output is concerned, on the Pacific coast. There is a small furnace at Port Townsend, which is owned by the Union Iron Works of San Francisco. This is occasionally kept in operation in the making of a pig iron and the product is of poor quality. The other furnace is located at Oswego, near Portland, Ore., and it makes a small quantity of iron, using charcoal instead of coke for smelting. The output of the furnace is utilized in the making of cast iron water pipes. One reason why the deposits of iron along the coast have not been utilized is because there is no coke produced there of suitable quality for the purpose. The coke has not sufficient structural strength to hold up the iron ore long enough for it to smelt. The coke made from the Crow's Nest coal is splendidly suited for iron smelting as it has more than ordinary structural strength. The advantage which the Kootenay iron and steel will have over that produced near the Atlantic seaboard will be the haul across the continent or the carriage

by vessel around Cape Horn. This will give the products a decided advantage as it will be almost equal to a monopoly of the market. Under the circumstances it looks as though the project would be among the most successful that ever was undertaken in the Province.

Our congratulations to friend Blakemore on his success in this notable enterprise.

The high prices ruling for Canadian asbestos and the remarkable activity in the production of this valuable mineral from our old established mines in Eastern Quebec—the world's chief source of supply—has excited interest in other localities where indications of the mineral are known to occur. The latest fairy tale comes from the State of Vermont where deposits of a harsh, gritty, short fibred character are said to be under development. The fine spinning qualities of Canadian asbestos are so superior to any known product that competition from this source need not be seriously entertained. Like the Black Hills mica boom it is largely in the air.

In a lecture on mechanical rock-drilling, delivered by M. Henri Ghysen, Ingenieur des Mines, Belgium, he described two important drivings, one by means of hydraulic rock-drills, and the other by electric drills, arriving at the following conclusions:—The electric rock drill is far more suited to the work of collieries than is the hydraulic drill, on account of its slight weight and easy management. It is set up with less difficulty, and if the advance obtained is not quite so great, this circumstance is largely set off by the diminished cost of working. The hydraulic rock-drill is, however, calculated to render good service in very hard rocks when great speed of execution is required, and under which circumstances the advance made with the electric drill becomes slight. On the whole, in the works required at collieries the electric must be regarded as more economical than the hydraulic rock drill.

#### Our Mineral Exhibit at the Pan-American Exposition.

[SPECIAL CORRESPONDENCE]

Canadians generally, but geologists and miners especially, will find in the Mines Building at Buffalo's great Pan-American Exhibition an exhibit which will make every Canadian heart beat fast to think of the wonderful resources in minerals contained in their land. No other exhibit shown there can compare with it in beauty, variety or completeness. The Ontario exhibit is particularly noteworthy.

The Ontario exhibit is in charge of Mr. F. N. Speller, of Toronto, who takes the utmost pains to describe Ontario's mines to questioners. He also had, under the direction of Mr. T. W. Gibson, of the Ontario Bureau of Mines, much of the work of collecting samples and specimens, and he had an efficient assistant in Mr. J. Walter Wells, of the Ontario Assay Office, at Belleville, who contributed no small amount of time and labour toward the exhibit from Eastern Ontario. The whole exhibit is complete in every way, and maps of all the mineral lands are attractively shown and most clearly marked, so that the gaining of information is a very easy matter.

The exhibit is prominently situated and is enclosed by tall, very handsomely finished pillars surmounted by banners and the good old Union Jack. The original floor space promised was about 1,250 square feet, but as this could not be granted, the space is somewhat cramped, and as a result an "overflow" show of some of the larger specimens has had to be made on the floors of the porches. The exhibit is in itself a tangible illustration of the wonderful amount of economic minerals that is to be found in this one province. One of the most striking exhibits, which never fails to attract attention, is the gypsum statue of Miss Canada supported on three very large blocks



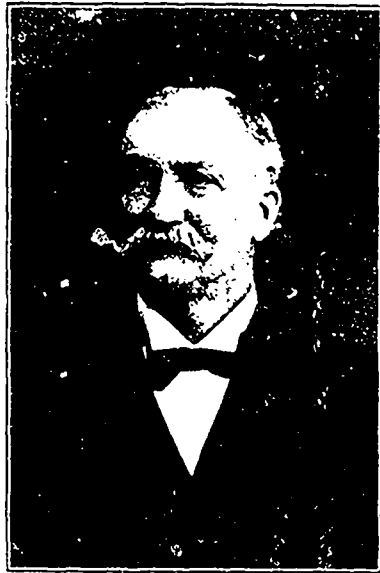
E. B. KIRBY, E.M.,  
War Eagle and Centre Star,  
Rossland, B.C.



BERNARD MACDONALD, M.E.,  
LeRoi Mine,  
Rossland.



S. S. FOWLER, E.M.,  
London and B.C. Goldfields,  
Nelson.



JOHN B. HOBSON, M.E.,  
Con. Cariboo Hydraulic,  
Bullion, B.C.



FREDERICK KEFFER, E.M.,  
B.C. Copper Co.,  
Anaconda, B.C.



A. B. W. HODGES,  
Granby Smelter,  
Phoenix, B.C.



ROBERT HEDLEY, E.M.,  
Metallurgist,  
Hall Mining and Smelting, Nelson.



PAUL JOHNSON, E.M.,  
Metallurgist,  
B.C. Copper Co., Greenwood, B.C.



FRANK ROBBINS, M.F.,  
North Star Mine,  
Kimberley, B.C.



ERNEST WOAKES, A.R.S.M.,  
Duncan Mines, Nelson.



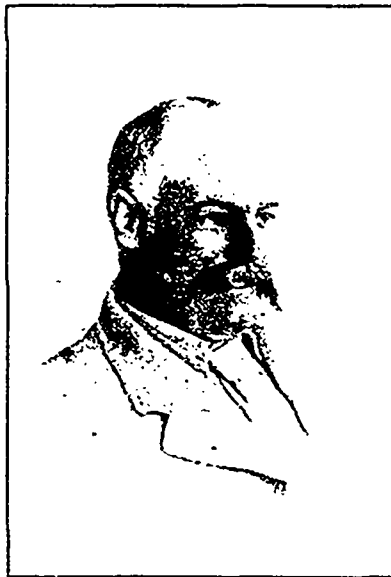
M. S. DAVYS, C. & M.E.,  
Nelson, B.C.



J. ROD. ROBERTSON,  
London and B.C. Goldfields, Nelson.



J. M. HARRIS,  
Reco Mine, Sandon, B.C.



LESLIE HILL, C. & M.E.,  
Vancouver, B.C.



E. J. FIELD,  
Sandon, B.C.



HOWARD WEST, A.R.S.M.,  
New Denver, B.C.



JAS. R. GIFFORD,  
Superintendent, Silver King Mine, Nelson.



GEORGE GUESS, M.E.,  
Greenwood, B.C.



W. L. LIBBEY,  
Brookfield Mining Co.,  
North Brookfield, N.S.



DR. E. GILPIN, JR.,  
Inspector of Mines,  
Halifax.



R. H. BROWN, M.E.,  
Sydney Mines,  
Cape Breton.



GEORGE W. STUART, M.E.,  
Truro, N.S.



CLARENCE DIMOCK,  
Wentworth Gypsum Co.,  
Windsor, N.S.



J. G. S. HUDSON, M.E.,  
Gowrie and Block House Colliery,  
Port Morien, C.B.



R. E. CHAMBERS, M.E.,  
Wabana Iron Mine,  
Newfoundland.



GRAHAM FRASER,  
Nova Scotia Steel and Coal Co.,  
New Glasgow, N.S.



W. L. GRAMMER, M.E.,  
Bell Island Iron Mines,  
Newfoundland.



W. J. McINTOSH,  
Royal Oak Gold Mining Co.,  
Goldenville, N.S.



EUGENE COSTE, M.E.,  
Prov. Natural Gas and Fuel Co.,  
Toronto, Ont.



JAS. CHAMPION, C. & M.E.,  
Barkerville, B.C.



JOHN M. ANDERSON,  
Anderson Gold Mine,  
Musquodoboit Harbour, N.S.



JOHN BLUE, C. & M.E.,  
Eustis Mining Co.,  
Eustis, Que.



HARVEY GRAHAM,  
Nova Scotia Steel and Coal Co.,  
New Glasgow, N.S.



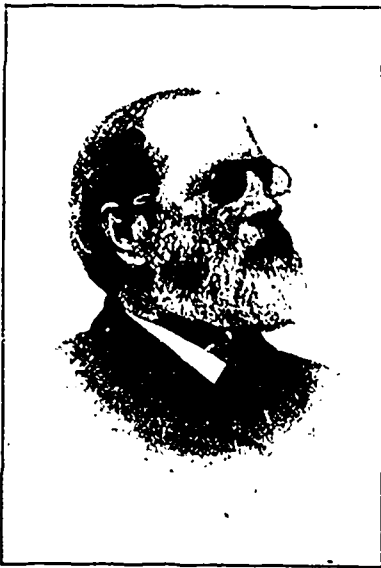
FRANK FULLER,  
Manager, Mica Mfg. Co.,  
Ottawa.



G. F. McNAUGHTON,  
Modstoc's Gold Mining Co.,  
Forrest Hill, N.S.



G. J. PARTINGTON,  
Dolliver Mining and Milling Co.,  
Country Harbour, N.S.



S. M. ROWINS,  
New Vancouver Coal,  
Nanaimo, B.C.



W. F. LITTLE,  
H. W. McNeill Co.,  
Anthracite.



ELLIOT T. GALT,  
Alberta Railway and Coal,  
Lethbridge, N.W.T.



J. R. COWANS,  
Cumberland Ry. and Coal,  
Springhill, N.S.



CHARLES FERGIE, M.E.,  
Intercolonial Coal,  
Westville, N.S.



T. J. BROWN,  
Old Sydney Mines,  
Cape Breton.



ROBERT ARCHIBALD, C. & M.E.,  
Canada Coals and Ry.,  
Joggins Mines, N.S.

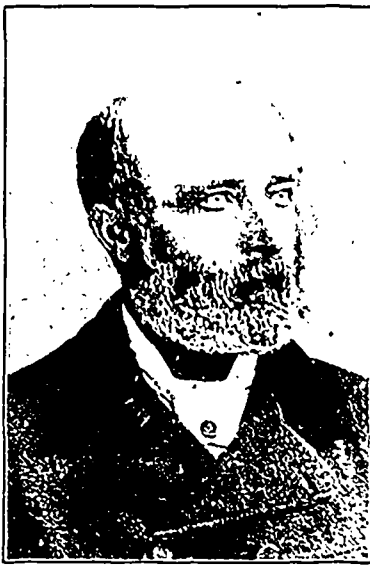


H. S. POOLE, A.R.S.M., M.E.  
Halifax.



O. E. S. WHITESIDE, M.E.,  
H. W. McNeill Co.,  
Anthracite, N.W.T.





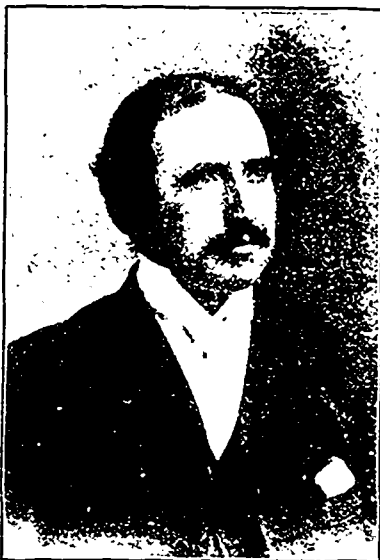
**ROBT. ROBSON,**  
Manager, International Colliery,  
Dominion Coal Co., Cape Breton.



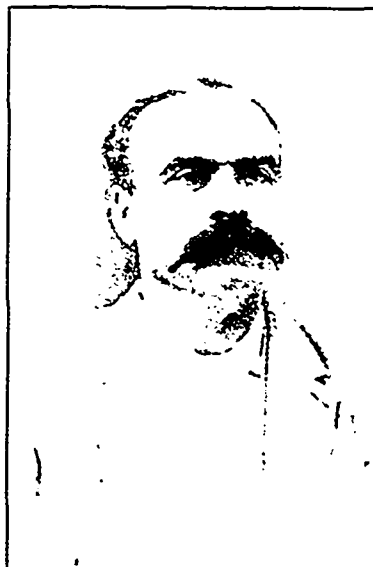
**JAS. MAXWELL,**  
Mine Manager, Acadia Colliery,  
Westville, Nova Scotia.



**A. MCEACHREN,**  
Manager, Dominion No. III Colliery,  
Cape Breton.



**NORMAN MCKENZIE,**  
Underground Manager, Reserve Colliery,  
Cape Breton.



**M. BLUE,**  
Deputy Inspector of Mines for  
Nova Scotia.



**A. J. SCOTT,**  
Underground Manager, Dominion No. I Colliery.



**WM. LORIMER,**  
Underground Manager, No. II Slope,  
Cumberland Ry. and Coal Co., Springhill, N.S.



**E. WILKINSON,**  
Underground Manager, S.M. Colliery,  
N.S. Steel and Coal Co., Sydney Mines.



**B. CONNORS,**  
Underground Manager, International Colliery,  
Cape Breton.



**JAMES McARTHUR,**  
General Manager, Canadian Copper Co ,  
Copper Cliff, Ont.



**A. P. TURNER,**  
Asst. Gen. Manager, Canadian Copper Co.,  
Copper Cliff, Ont.



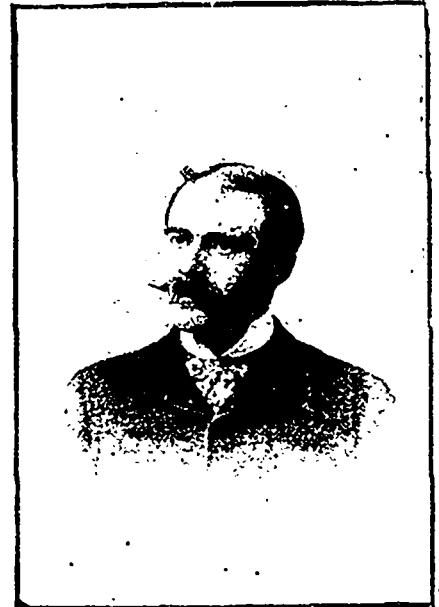
**HIRAM W. HIXON, M.E.,**  
General Manager, Mond Nickel Co.,  
Whitefish, Ont.



**A. S. BURROWS,**  
Manager, Rock Lake Mining Co.,  
Bruce Mines.



**MAJOR R. G. LECKIE,**  
Sudbury, Ont.



**MAJOR W. HAMILTON MERRITT,**  
Mining Engineer,  
Toronto.



**J. H. CHEWITT, C. & M.E.,**  
Toronto, Ont.



**F. HILLE, M.E.,**  
Port Arthur, Ont.



**H. A. GUESS, M.E.,**  
Sakoos Mine, Keewatin, Ont.



C. HARGREAVES,  
Cumberland Ry. and Coal Co.,  
Springhill, N.S.



WM. MATTHEWS,  
Asst. Manager, Cumberland Ry. and Coal Co.,  
Springhill.



J. T. BURCHELL,  
Cape Breton Coal Co.,  
New Campbellton, C.B.



JOHN JOHNSTONE,  
Manager, Port Hood Coal Co.,  
Port Hood, C.B.



WM. BLAKEMORE, M.E.,  
Fernie, B.C.



JAMES McVEY,  
Manager, Reserve Colliery,  
Dominion Coal Co.



HUGH FLETCHER,  
Coal Geologist, Geol. Survey of Canada,  
Ottawa.



JAMES BAIRD,  
Chignecto Colliery,  
Maccan, N.S.



P. CHRISTIANSON,  
Manager, Caledonia Colliery,  
Dominion Coal Co., Glace Bay, C.B.



JOHN E. HARDMAN, S.B., M.E.,  
Consulting Engineer,  
Montreal.



DR. FRANK D. ADAMS,  
McGill University,  
Montreal.



GEORGE E. DRUMMOND,  
Canada Iron Furnace Co.,  
Montreal.



J. OBALSKI, M.E.,  
Inspector of Mines,  
Quebec.



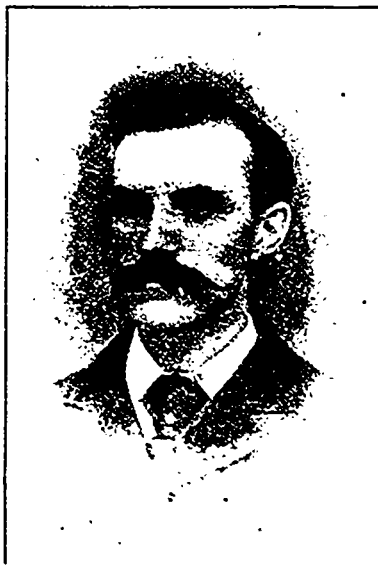
HON. A. A. TURGEON, M.L.A.,  
Commissioner of Mines,  
Quebec.



GEORGE R. SMITH, M.L.A.,  
Bell's Asbestos Co.,  
Thetford Mines, Que.



JOHN J. PENHALE,  
Manhattan Asbestos Co.,  
Black Lake, Que.



S. L. SPAFFORD,  
Nicholls Chemical Co.,  
Capelton, Que.



H. P. H. BRUMMELL,  
North American Graphite Co.,  
Buckingham, Que.



FRITZ CIRKEL, M.E.,  
Montreal, Que.



RUSSELL BLACKBURN,  
Blackburn Mine,  
Templeton, Que.



E. WALLINGFORD,  
Wallingford Mica. Co.,  
Templeton, Que.



J. T. DONALD, M.L.A.,  
Analytical Chemist,  
Montreal.



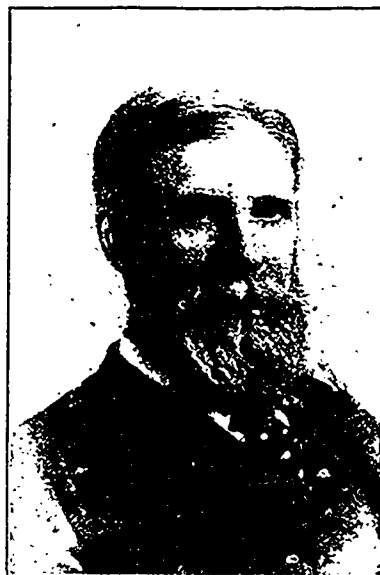
MILTON L. HERSEY, M.A.Sc.,  
Analytical Chemist,  
Montreal.



JOHN J. DRUMMOND, M.E.,  
Radnor Forges, Que.



R. T. HOPPER,  
Standard Asbestos Co.,  
Montreal.



J. BURLEY SMITH,  
Mining Engineer,  
Montreal.



E. B. HAYCOCK,  
Ottawa.



D. G. KERR, C. & M. E.,  
Cordova Exploration,  
Marmora, Ont.



J. P. KIRKGAARD,  
Canadian Gold Fields,  
Deloro, Ont.



W. A. HUNGERFORD,  
Atlas Arsenic Co.,  
Marmora, Ont.



DR. W. L. GOODWIN,  
Director, School of Mining,  
Kingston, Ont.



T. W. GIBSON,  
Director, Ontario Bureau of Mines,  
Toronto



DR. A. P. COLEMAN,  
School of Practical Science,  
Toronto.



SYDNEY B. WRIGHT, F.I.C.,  
Canadian Gold Fields,  
Deloro, Ont.



A. MARSHALL HAY,  
Dominion Gold Mining and Reduction Co.,  
Rat Portage, Ont.



E. D. INGALL, A.R.S.M.,  
Chief Statistics, Geological Survey,  
Ottawa.



T. R. DEACON, C. & M.E.,  
Rat Portage, Ont.



CHARLES BRENT, M.E.,  
Rat Portage, Ont.



C. F. WILLIS, M.E.,  
St. Johns, Newfoundland.



R. C. CAMPBELL-JOHNSTON, M.E.,  
Nelson, B.C.



F. H. MASON, F.C.S.,  
Halifax.



JAMES D. SWORD, M.E.,  
Nelson, B.C.



H. HARRIS, A.R.S.M., F.G.S.,  
Vancouver, B.C.



J. F. BLEDSOE, M.E.,  
Alberni.



THEO. BRIEDENBACH,  
Mine Manager, Rat Portage, Ont.

of graphite, under which is a handsome limestone pedestal from the Queenston Quarry. The graphite is from the Black Donald Mine, Brougham Township, Lanark Co. One lump of two tons weight is the largest mass of graphite ever mined. Hundreds ask daily about this important material which enters into numerous commercial uses, such as graphite paints, black lead, lubricants, etc. Your correspondent overheard one gentleman say: "And they look for gold, with millions in graphite. I cannot understand it."

#### EASTERN ONTARIO'S SHOWING

The exhibits from the working mines in Eastern Ontario show considerable activity in that district. The Canadian Goldfields, Limited, operating in North Hastings, have a very handsome and instructive exhibit, showing the various stages of the manufacture of white arsenic from the ore as it comes from the shaft, to the finished article, ready for the market, carrying 99.8 per cent.  $As_2O_3$  equal to the best German and English grades of white arsenic. They also show the extraction of gold by amalgamation, and bromo-cyanide leaching in the same way, and have several bricks and cones representing the gold in its complete and pure condition. The specimens of mispickel ores, some showing free gold, are especially attractive.

The following exhibits from the district are worthy of note: Specimens of free milling gold ores from the Landenberger property in Hastings county; quartz with auriferous pyrites from the Belmont mine, now having a 30-stamp mill and cyanide plant working in Peterborough county; arsenic and mispickel gold ore from the Atlas Mine in Hastings county; also a similar exhibit from the Ohio Gold and Arsenic Mining Co.'s property in Marmorata township. Some very fine specimens of free milling gold quartz from the Craig mine and the Sophia mine are objects of great interest. From the James mispickel property in Madoc township, Hastings county, there are several fine samples of arsenical pyrites, and the James Actinolite and Asbestos Manufacturing Co., at Actinolite, Hastings county, show very fine samples of their roofing materials. The sale of this fire-proof roofing material is almost entirely confined to the United States. The Toronto Mining Co. have a beautiful show of mispickel gold ores from the Campbell-Bloomfield property in Marmorata township, Hastings county, and the Ledyard mine in Belmont township, Peterborough county, is represented by a splendid showing of rich looking gold-bearing quartz with pyrites.

In iron ores there is a very fine showing from this particular district. Among the magnetic ores, the most prominent are from the Sewmillee mine in Tudor, the Cook mine in Madoc, the Malone mine in Marmorata, the Belmont mine in Belmont, the Coe-Hill mines in Wollaston, the St. Charles mine in Tudor, the New Find mine in Eldorado, and its neighbour the Sprague mine; the Child's mine in Mayo, and the Blairton mine in Belmont. All of these shipping mines are adjacent to the Central Ontario Railway.

The show of hematite ores is mostly from the Wallbridge, St. Charles, Welch, Empey and Eldorado mines of Madoc, and the Miller mine of Huntingdon. All of these mentioned mines are rich in ore, and nearly all are now being more or less actively worked. The greater part of the ore is shipped to Hamilton or Midland iron smelters.

From Frontenac county comes a fine exhibit of felspar, a valuable flux used in making china ware; and from Peterborough, Renfrew and Hastings counties are the exhibits of the very valuable mineral, corundum, which is being handled and shown in every state from raw rock to manufactured goods, such as corundum wheels, by the Canadian Corundum Company of Combermere. The value of this exhibit to Canada is very great, as it shows that the Canadian

corundum is likely to control the market for abrasives, owing to an abundance of cheap raw material combined with the superior quality of the corundum as prepared for commercial use.

Building stones, such as limestones, marbles, etc., are represented by rough and dressed stones from the quarries in Hastings county, such as the Crookston quarry.

The Harrison talc mine near Madoc village shows samples of talc in the rough and ground ready for use as a paper-filler.

The mica mines in Frontenac county, supplying mica for electrical purposes, have excellent exhibits of rough and thumb-dressed mica. The Mica Boiler Covering Company of Toronto show, by samples, how scrap mica from the mines is utilized as boiler and pipe coverings, an excellent non-conductor of heat.

That Eastern Ontario is not deficient in precious stones is shown in a case of very handsome rocks containing sapphires, garnets and sodalite, and some of these have been pronounced by experts to be exceptionally fine stones, although in the rough.

Molybdenite, which is assuming commercial importance in the manufacture of ferro-molybdenum, used in the hardening of steel, is shown, but not in very large quantities.

In the eastern portions of Ontario are found beds of marl, of value in making cements, which are represented by raw material and cement from the extensive plant of the Canada Portland Cement Co., of Marlbank, also by marl from White Lake, Hastings county, analysing 94 per cent. calcium carbonate. These beds of high grade marl will shortly be utilized, as the demand for cement is constantly increasing.

Iron pyrites is in evidence, a fine sample shown coming from the Burnsides mine, near Bannockburn, Hastings county, being worked by the Nichols Chemical Co. of Capelton, Quebec.

#### SUDBURY DISTRICT.

The important mining and metallurgical nickel-copper industry of the Sudbury district is represented by samples from every working mine, ranging from 500-pound samples to one mass of pyrrhotite from Copper Cliff Mine, weighing five tons.

Every process and stage for the extraction of the nickel and copper is illustrated by samples.

The Nickel-Copper Co. of Hamilton, Ontario, show the Frasch electrolytic process for the extraction of nickel, copper, etc., from the matte.

The Bruce Mines and Rock Lake Mines show copper ores from these extensive deposits, being worked by modern methods. Exhibits of pig iron and ferro-nickel, as made from nickeliferous pyrrhotite by the metallurgists of the Clergue Syndicate of Sault Ste. Marie, are of special interest to steel experts.

#### MICHIPICOTEN DISTRICT.

The Lake Superior Power Co., of Sault Ste. Marie, have exhibits of iron ores from the Helen, Josephine and other important ore bodies in the Michipicoten district, showing the wealth of this district in hematite iron ores, which are now entering the American and Canadian markets.

#### RAINY RIVER DISTRICT.

The mineral resources of Western Ontario are represented by auriferous quartz from the working gold mines, such as Mikado, Regina, Sultana, Sakoose, also from several developed properties.

Most of these ores are low grade, but yet profitable under capable mill management, as they are all free-milling.

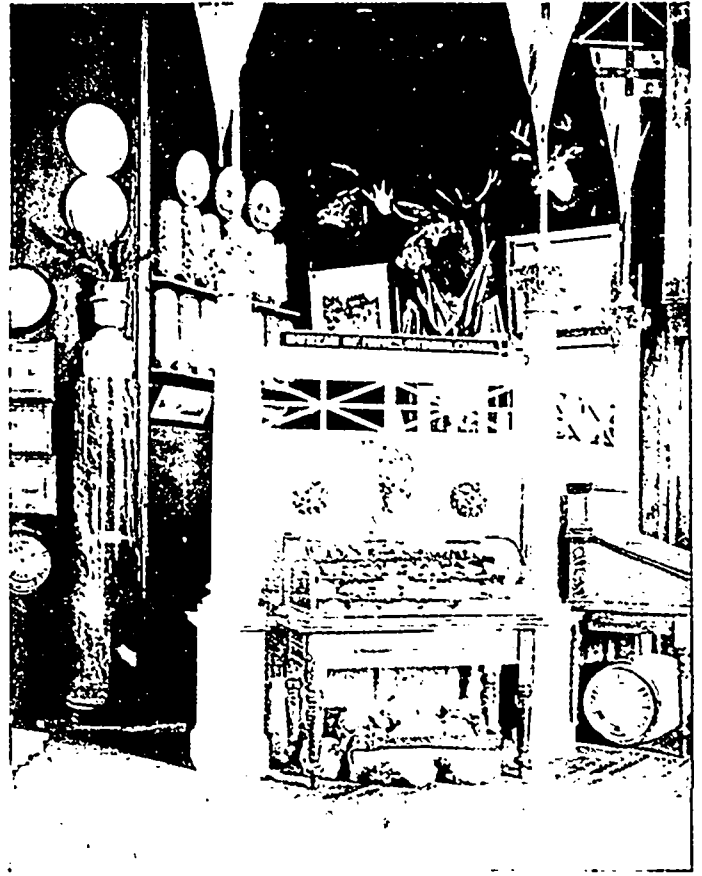
Iron ore from the Atikokan and Mattawin iron ranges being tapped by railway connection from Port Arthur, show that this district has abundance of high grade iron ore which, according to expert



ONTARIO'S MINING DISPLAY AT THE PAN-AMERICAN.



Exhibit of Auriferous Mispickel from the Mines of Hastings Co., Ontario.



Superintendent's Office—Ontario Mines Exhibit.



Exhibit of Structural Materials by Ontario Bureau of Mines.



Exhibit of Gold Quartz—Arch built of Milton Pressed Brick in background.

ONTARIO'S EXHIBIT OF MINERALS AT THE PAN-AMERICAN EXHIBITION.



The central figure "Miss Canada" shows the huge block of Graphite from the Black Donald Mine upon which the figure rests.

geologists, is exactly of the same formation as the Minnesota iron ore lying to the south-west, so that Ontario is probably to be an important iron ore producer

As a whole, the Ontario exhibit is a tangible proof of the natural wealth in mineral resources of that extensive province, and is a credit to the Bureau of Mines.

That Ontario has a promising future in its mining industries, especially in regard to iron, copper, nickel and gold, can be seen from the recent reports issued by the Government as well as from the statistics of the production for the year 1900, as compared with previous years.

## COAL MINING AND TRADE.

The condition of the coal trade in Nova Scotia has already occasioned considerable anxiety among the mine owners, and is rapidly assuming the phase which was indicated in these columns several months ago. Prices have already fallen from \$4.00 and even \$5.00 down to \$2.50, and with the exception of the Dominion Coal Company none of the concerns are able to work full time. On the trading of the first six months of the year, all the companies, except the Dominion Coal Company and the Nova Steel and Coal Company show a considerable decrease aggregating nearly 100,000 tons, and with two new competitors in the market, in the Port Hood Coal Company and the Broad Cove Coal Company there will be considerable hustling during the rest of the season to make anything like a decent showing. In face of this the Nova Scotia Steel & Coal Co. are losing no time in putting down their new plant near Cranberry Head, and in their recently issued prospectus they estimate an output of 600,000 tons per annum, which is nearly three times the tonnage of the old company. As their coal is admittedly the best produced in Nova Scotia there is little doubt that they will always get their share of the trade, and if the directors of the Dominion Coal Company are able to cancel their unfortunate contract with the Everett Gas Company it will throw from 500,000 to 800,000 tons of coal upon the open market. This means that next year an additional outlet will have to be found for at least a million tons; and as the whole market is glutted and the railway companies are carrying heavy stocks, it will depend entirely upon the export trade whether this tonnage can be placed or not. We have repeatedly urged in these columns the absolute necessity for seeking a foreign market if the prosperity of the Nova Scotia coal trade is to be maintained. There is reason to believe that in this, as in several other important matters the Nova Scotia Steel & Coal Company will be the pioneers, as they have already opened up negotiations with a London firm for the sale of their coal. We are more convinced than ever that the London market is capable of taking at least two million tons per annum of our coal, and that it is possible to lay the latter down in the Thames at a lower price than the average cost of a similar English or Welsh coal estimated over a term of years. It looked, a few months ago, as if English capital would ensure this by taking up coal areas and developing them for the English market; but, owing to the cupidity of those who held available areas no actual sales have been made, a fact which we cannot regret, because the true interests of mining in this country are ill served by the exaction of exorbitant prices. Now that a lull has fallen upon the coal trade and prices are being reduced all the world over Canadians will begin to realise that in this respect they have missed their chance, and that the only probable chance of exporting coal to England rests upon the investment of Canadian capital. In this connection we regret to have to report the absolute failure of the exploratory work carried on by Senator

McKeen and his colleagues upon the McVey areas; after three months' work and the expenditure of a considerable sum in boring operations the millstone grit has been reached without the discovery of any workable seam of coal, the only one passed through being four feet thick, and of doubtful quality. This is a great disappointment, not only to those immediately concerned but to the country at large, because it has been confidently maintained for many years that available coal measures underlay these areas, a view fully shared by the highest authority in the Geological Department, Mr. Hugh Fletcher. We are not yet satisfied that the question is settled, being of opinion that the bore holes were not put down in the most favourable position. Instead of boring near Grand Lake, we would have preferred seeing operations conducted in the immediate vicinity of Cochrane's Lake, where the late Mr. E. L. Moseley did considerable work, and in the judgment of good authorities bored within fifty or a hundred feet of the Mullens seam. However, it would be superfluous to suggest that anyone is better acquainted with the coal fields of Cape Breton than Senator McKeen and his associates; and if they say that the question is finally disposed of, it will be hard to induce anyone else to take up the proposition.

Considerable activity is being displayed in the district in which new discoveries of coal have been made in Alberta, and although it is too early to assess the exact value of this coal field, or to admit with those who are sanguine on the subject that it rivals in importance the areas of the Crow's Nest Pass, it must be admitted that the discoveries already made are of sufficient value and extent to justify the opinion that these coal fields will some day become an important factor in the west. All the way from Livingstone to Crow's Nest Lake and the Summit, a distance of nearly twenty miles, good workable seams of bituminous coal have been located. The quality is in some instances first class and only slightly inferior to the best coals at Fernie. One of the most favourable analyses is taken from a 14-foot seam on the property belonging to Messrs. McVittie and Leitch, which gives:

Moisture.....	1.0
Fixed carbon.....	63.4
Volatile combustible matter.....	29.1
Ash.....	7.4
Sulphur.....	.36
Coke.....	70.8

Upon this property there are fifteen workable seams of coal, aggregating 120 feet in thickness. Messrs. Fishburn and Procter have also taken up a valuable property in the immediate vicinity of Blairmore Station, and six miles nearer to the mountains the Galt Company hold a number of sections. In addition to this at least half a dozen other companies are doing exploratory work; but the greatest progress has been made by Messrs. Frank and Gebro, who have taken up four square miles on the east side of Turtle mountain and have already opened up a mine and established a town. They have a vertical seam of coal fourteen feet thick, which has been proved for a distance of four miles upon the surface, and they have already done sufficient development work to yield an output of 200 to 300 tons a day. The analysis of their coal is as follows:

Moisture....	1.0
Fixed carbon.....	60.3
Volatile combustible matter.....	31.3
Ash.....	7.4

The coal has been subjected to severe tests for steaming and has yielded satisfactory results. It is doubtful whether it is a first class

coking coal, but this point will shortly be solved, as coking ovens are to be erected for experimental purposes. In any case, the energy and enterprise shown by these gentlemen is worthy of all praise; and if they are able to secure a portion of the steam and domestic trade of the west they will probably make a good showing. In this connection we wish to warn investors against rushing in and creating a boom, for which there is no justification, when it is remembered that in any event these coals are not equal to those in the past and therefore, that the market is extremely limited, and already well covered by the mines in operation. The advent of Mr. J. J. Hill and his associates, who have not only obtained a controlling interest in the Crow's Nest Pass Coal Company, but have also taken up twenty thousand acres of good steam coal on the east of the Rockies, adjoining the south fork of Old Man's River, must mean a great reduction in the price of coal, and also that he will ultimately obtain all his supplies from the mines in which he is interested. The only other large purchaser is the C.P.R. and while their policy has not yet been defined investors would do well to bear in mind that they will, during the present fall be placed in possession of six square miles of coal areas in the Pass, as a part of their subsidy for the B.C. Southern and if they should decide to operate these for their own requirements the possible market for new ventures will, for many years to come, be extremely circumscribed. We understand that efforts are being made to introduce English capital, and that agents are at this moment actively engaged in this work in London. Whilst we welcome the introduction of English capital into Canadian ventures, and especially into the mining industry, we wish to point out that, in the present instance great care should be exercised and a very careful investigation into the possibilities of a market should be made before purchasing areas in this new coal field before embarking upon any considerable outlay. It is not a question of coal, or quality; both are undoubtedly satisfactory—it is entirely a question of market.

Mr. F. B. Smith, for some years with the Crow's Nest Pass Coal Company has been appointed Inspector of Mines to the Government of the North-West Territories, in place of Mr. Evans, resigned. Mr. Smith will enter upon his duties on the 1st September and will take up his residence at Calgary. He is well acquainted with the district, having had ten years experience in the coal mines of British Columbia, and we congratulate him upon the appointment, and the Territories on having secured a practical mining engineer for the position of inspector.

We understand that the company, which has been operating under the title of the British American Coal Company, Alberta, consisting of Toronto capitalists in the disputed areas near Crow's Nest Summit, succeeded a few months ago, in bonding their property to a well known Canadian corporation. We have no idea what the consideration was, but understand that a considerable amount of cash changed hands in anticipation of its proving a second Crow's Nest Pass coal field. No one having practical knowledge of the district shared these anticipations, and those who were acquainted with the country have always regarded the enterprise as chimerical. The work of the last three months fully confirm this latter view, and the people who put up the money have had the satisfaction of proving that the property in question consists mainly of limestone mountains, and detached fragments of coal. There is no doubt sufficient coal to supply the consumption of the immediate neighbourhood, which would probably not exceed a thousand tons a year, but for any serious coal mine the property is entirely out of the question. It is a case of paying first and then being wise after the event.

### Granby Smelter.

Considerable interest is aroused in British Columbia by the announcement that the Granby Smelter people contemplate an increase in their capitalization, raising it from fifteen million to twenty million dollars, and these who are best able to judge consider the proposal a farcical one in view of the past history of the company. In a thoughtful and very able article which appears in the British Columbia Mining Record of last month argued that among the many causes which had contributed to the present depression in the Province, possibly the most important was over capitalization, a contention which is emphasized by the enormous increase in values shown by present market quotations on British Columbia Mining Stock, compared with those of a year ago. It has been the custom in the east to attribute this loss chiefly to the failure of mining propositions to realize the expectation formed as to their productiveness, but the writer of the article referred to shows very clearly that the number of failures under this head is small, and that mining ventures have been wrecked chiefly by the cupidity of eastern promoters. Of course this Province, like every other has had its share of wild cat schemes and the usual proportion of valueless mineral prospects, but in the main, whenever mining has been conducted under capable management and with due regard to economy, success has been attained. There are to-day in the Province a number of mines working under the latter conditions which would be a credit to any of the oldest camps in the United States, which are furnishing steady employment to a large body of workmen and paying regular dividends to the fortunate shareholders. The disappointing mines are those which, instead of being worked upon legitimate lines as a permanent investment, and for the purpose of yielding moderate but continuous dividends have been simply manipulated for gambling purposes by speculators or promoters, who cared nothing for the ultimate result, and stood only to enrich themselves at the earliest possible moment at the expense of the investing public who were ignorant of their policy. One of the commonest methods of attaining this end has been by over-capitalization, which has placed at the disposal of promoters an inordinate number of shares and thus enabled them to take advantage to an undue extent of any increase in value, which by skilful scheming they were able to create on the stock market. Without suggesting that this is the case with the people who are responsible for the management of the Granby properties it is an undoubted fact that the present capitalization of fifteen million dollars is enormously in excess of the value of the property, and to raise it still further will only tend to accentuate an evil which has already been productive of great loss to the Province. It is a well known fact that the total expenditure in cash both for purchase and development of all the properties in the Granby smelter group, including the smelter itself does not exceed one million dollars, and when in the early months of this year the representatives of this company, Mr. J. P. Graves and Mr. A. L. White were in New York negotiating for the sale of the property, or at any rate exchanging pour parlers with the Amalgamated Copper Company having that object in view, the latter could not be induced to give as much as two million dollars for the property, and they are probably as good judges of its value as it would be possible to find. How, in face of these two facts a capitalization of twenty million dollars can be defended passes the comprehension of mining men in British Columbia, who feel that it is only inviting a catastrophe to take such a step. It is further urged that there certain circumstances connected with the Granby company which are not calculated to inspire confidence, and which in fairness to their own shareholders at any rate, if not to the investing public, should be explained. The first is, that no authoritative statement has yet been given as to the average value per ton of ore treated, although the smelter has been in operation since last year. Repeated appli-

cations have been made to the company by shareholders for this information, but it has been refused for motives of policy. In view, however, of the present proposal it can hardly be withheld any longer, and if, as is currently believed by those in the best position to judge the average gross value of the ore treated does not exceed five dollars, it is doubtful if operations are not being carried on at a positive loss, in which case further increase in capitalization would be indefensible and the present quoted price of Granby stock far in excess of its actual value. British Columbia has already suffered sufficiently from misleading reports made by directors of leading mining companies to their shareholders, and it is hardly less culpable on the part of the directors of the Granby company to withhold important information, without which it is impossible to estimate the value of the stock which they are apparently bent on increasing and which in any case they are offering the public as an attractive investment.

### Gold and Arsenic.

#### FINE EXHIBIT MADE BY THE CANADIAN GOLD FIELDS AT PAN-AMERICAN.

The Deloro Mine, situated in the Township of Marmor, Hastings County, Ontario, is unique among the mines of the world in that it is a producer of *both* gold and arsenic. Moreover no other mine in all America is a producer of arsenic.

Besides being unique among producing mines, the Deloro has other somewhat exceptional characteristics. These are in connection with the form and relations of its ore bodies.

The exhibit is intended to illustrate not only the products of the mine, but it also shows, by means of hand specimens, the character of the complicated ore bodies.

The mine is situated near the contact of two igneous masses of rock of Laurentian age. The older of these masses is quartz diorite. Immediately to the east of the diorite mass, there is a large area of granite with a width of several miles. The granite is seen to be younger than the diorite, as it sends dikes of various sizes through it in every direction.

Crystalline limestone or calc schist also of Archaean age occurs not far distant from the mine and has also been cut through by granite dikes. Silurian limestone forms outliers over the Archaean within one half mile to the west of the mine.

The openings or cavities now occupied by the ore bodies owe their origin in all probability to the contraction of the granite mass on cooling. The disturbed zone along which the granite dikes cut through the diorite was again fractured. This fracturing was apparently done very gradually, as there is little evidence of faulting. The openings are due to a simple pulling apart of the diorite by the cooling and contracting of the large mass of granite. The diorite being cool and also being cut through by granite dikes was apparently less able to withstand the more or less horizontal pull of the contracting granite mass than the warmer and tougher granite itself. Hence the ore bodies are found in the diorite zone.

The openings were no doubt further enlarged by the action of water on the diorite.

The following cuts represent specimens in the collection which are used in place of artificial models, to illustrate fractures actually observed in working the ore bodies. They show on a small scale most of the characteristics of the deposits.

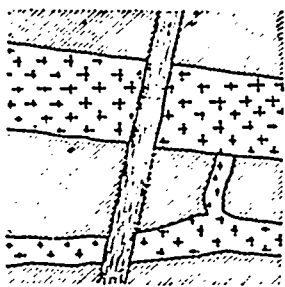


Fig. 1.

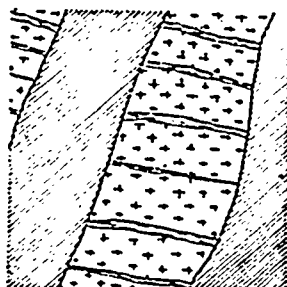


Fig. 2.

Specimen No. 1 shows that the veins of quartz, which are generally more

or less lenticular in form, hold their course through both the granite and diorite, and are thus younger than either of these igneous rocks.

Specimen No. 2 shows that there was considerable contraction in the smaller granite dikes at least.

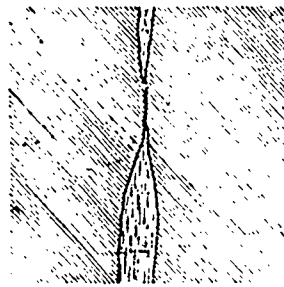


Fig. 3 (a).

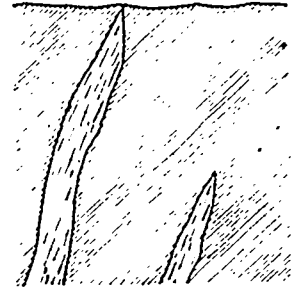


Fig. 3 (b).

Specimen No. 3 shows the lense shape form of the ore bodies. Some of the lenses outcrop at the surface, the exposures representing sections through the more central parts of the lenses. At other times, the extreme edge of a lense shows at the surface. Again lenses have been encountered in mining which do not outcrop at the surface. Specimen 3 (b) illustrates this last occurrence.

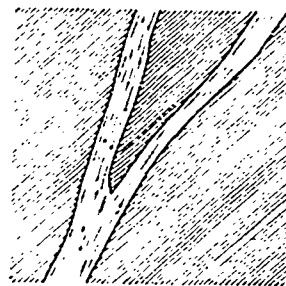


Fig. 4.

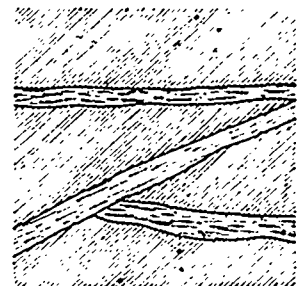


Fig. 5.

Two lenses with a slightly different strike and different dip come together. This is seen in the main working where the so called Gatling vein forms a junction first with the Tuttle and at a greater depth with the Dowd. Specimens 4 and 5 illustrate this phenomenon.

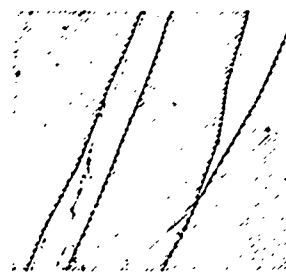


Fig. 6.

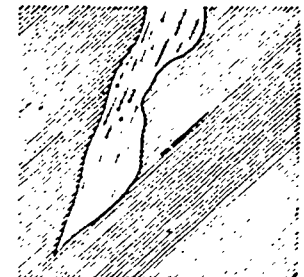


Fig. 7.

Specimen No. 6 shows two parallel lenses, one of which reaches to a comparatively short distance below the surface.

Specimen No. 7 shows a wider out-crop becoming narrower as the lense is followed downward. It also shows irregularity in size. At other times the lenses increase in size with depth, and generally become more regular and better defined.

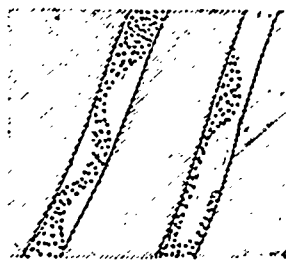


Fig. 8.

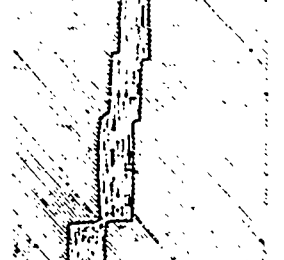


Fig. 9.

Specimen No. 8 shows two parallel veins with richer and leaner bunches of ore.

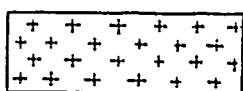
Specimen No. 9 shows how a foot wall may become the hanging wall

in going upward, due to the character of the original crack in the rock and not to faulting of the vein. This actually occurs in the winze connecting the third and fourth levels in the main working.

KEY TO ILLUSTRATIONS.



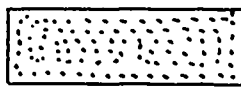
Diorite.



Granite.



Quartz Vein.



Gold Values.

Specimens Nos. 11 and 12, Diorite; Nos. 13 and 14, Syenite phase of Diorite; No. 15, Granite; Nos. 16 and 17, Granite dikes, cutting Diorite; No. 18, Breccia, Diorite cut by granite and veined with quartz from south end of fourth level; Nos. 19 and 20, Schist from decomposition of Diorite along the walls of the veins or lenses; No. 21, interbanded altered Diorite with siderite which occurs along extremities of lenses; No. 22, calc schist; No. 23, Silurian limestone.

The material filling the ore bodies consists of quartz together with mispickel, iron pyrites, copper pyrites, hematite and various carbonates calcite, siderite, ankerite, hornblende and free gold. Pieces of the wall rock are frequently found mixed with the vein matter.

Specimens of the ore of various kinds from the different veins are shown in the collection.

The peculiar structure and occurrence of these ore deposits have been studied very closely during the past five years, by the writer, and the plan of working them has been in conformity with the conclusions arrived at.

Lately these conclusions have been fully confirmed by Prof. W. G. Miller, Government Geologist, after a close and careful examination of the mine workings and the surrounding country. The writer is also greatly indebted to this gentleman for able assistance rendered in the collection of these specimens.

TREATMENT OF THE ORE.

Following up the samples, we here show the crushed ore "battery pulp," then samples of concentrates and of tailings, and again the concentrates after being roasted for their arsenic contents.

The method of treating these ores is briefly as follows:

The ore is crushed with gravity stamps, the major portion of the gold contents is saved by amalgamation inside the mortars and on the plates.

The pulp flows to the concentrators, "Frue Vanners and Willeys," the tailings being automatically sampled and allowed to run to the tail dumps.

The concentrates consist of mispickel mainly and carry about forty per cent. of the original gold in the ore.

The concentrates are treated for their gold contents by the Bromo-Cyanide Process, which, in combination with the amalgamation above mentioned, extracts eighty-five to ninety per cent. of the gold values in these ores and at minimum cost.

The process used for extracting the gold from these concentrates was first invented and patented by Messrs. Sulman and Teed, and known as the Sulman-Teed Bromo-Cyanide Process. This company acquired the sole right to these patents for Ontario in 1896, and have since developed the process to meet the peculiarities of these refractory ores successfully.

ARSENIC.

The concentrates after leaching by Bromo-Cyanide liquor are transferred to the arsenic works where they are calcined. The residue from the latter operation is here represented by "roasted concentrates" These are cooled and allowed to accumulate outside, there to await possible further treatment for their iron contents.

The product from the calcination consists of crude arsenic of different degrees of purity (see samples) and this is collected in a series of condensing chambers.

The crude arsenic is in turn refined, producing white Arsenic (As<sub>2</sub>O<sub>3</sub>) The refined arsenic is also collected in condensing chambers, portions of it forming into crystals in various forms as shown, and the balance as a fine powder.

The crystals and fines are then ground together to a very fine powder, the product packed in kegs containing 400 to 450 pounds each and shipped to the consumer.

SUMMARY.

It will be readily understood that this mine has presented a great many peculiarities and difficulties from geological and metallurgical points of view respectively. Many attempts have been made to extract the gold values in these ores, and a vast amount of capital has been expended in fruitless efforts.

Monuments to this may be seen on photos Nos. 1, 2 and 3, showing that three mills have been built at different periods. The first two were total failures, the third only partially successful.

All of these attempts showed conclusively what should not be done, and served as a most valuable lesson, which the present management did not fail to profit by when designing the plant now running. This plant can be seen on photo No. 4.

Photos No. 5 and 6 are general views of the mine surface plant; No. 7 shows the Galling or main shaft house; Nos. 8 and 9 the Air Compressor building and the engine within; No. 10 the workmen's quarters; No. 11 the staff's quarters and office; and No. 12 the Deloro Hall. This was built by the company for their employees to be used for church, school and library purposes, and for social gatherings.

Rossland in 1900.

By J. KIRKUP, Gold Commissioner.\*

The ore shipments made were as follows:—

Le Roi.....	159,734 tons.
Le Roi No. 2 .....	3,013 "
War Eagle .....	9,886 "
Centre Star.....	40,875 "
Iron Mask.....	2,739 "
Evening Star.....	345 "
Giant .....	504 "
I. X. I.....	432 "
Spitzee.....	106 "

Total..... 217,636 "

Gross value..... \$2,333,125

DETAILED STATEMENT.

Le Roi Mine.

Tons of ore shipped (dry).....	159,734
Gross value.....	\$1,437,726
Average number of men employed.....	655.25
Underground.....	435.85
Surface .....	219.4

Development—

Shafting.....	900 feet.
Driving .....	2,061 "
Raising .....	379 "
Cross-cutting.....	1,085 "

Additions to plant—

Total value of plant and surface improvements..... \$378,207.90

Additions for this year consist of—

- 1 30-drill air compressor.
- 1 hoist engine, steam operating.
- 1 electric hoist engine.
- 9 boilers.
- Crushing and sampling machinery.
- Additions to compressor building—
- New boiler house for 12 boilers, 38 feet by 140 feet.
- 3 new ore-bins, 1,000 tons holding capacity.
- Aerial tramway; capacity, 100 tons per hour.
- New head frame, 100 feet high.
- Hoist engine room.
- Crushing and sampling mill; 100 tons per hour.
- Timber and timber framing shed and carpenter shop.
- Blacksmith and machine shops and storehouse.

ROSSLAND GREAT WESTERN MINES, LIMITED.

Nickel Plate Mine.

Tons of ore shipped.....	277.
Average number of men employed.....	113
Underground.....	82
Surface employees.....	31

Development—

Shafting— Raising third compartment alongside working shaft, making it a 3-compartment shaft.....	268 feet.
Sinking shaft, 3 compartments.....	218 "
Driving .....	1,900 "
Raising .....	59 "
Cross-cutting.....	1,131 "

Total value of plant and surface improvements \$61,319.66

\*Mining Report, B.C., 1900.

A new hoist engine has been added to the plant, and the surface improvements have had the following additions made:—

New hoist engine building.  
Head frame and ore bins.  
New brick compressor building.

KOOTENAY MINING COMPANY, LIMITED.

*Kootenay Mine.*

Tons of ore shipped.....	Nil.
Average number of men employed.....	35
Underground.....	26.33
Surface.....	8.67
Development—	
Shafting.....	466 feet.
Driving.....	474 "
Tunnelling.....	68 "
Winzing.....	80 "
Raising.....	299 "
Cross-cutting.....	529 "
Total value of plant.....	\$22,066.62

Additions consist of new compressor building and foundations.

LE ROI NO. 2, LIMITED.

*Josie Mine.*

Tons of ore shipped (dry), Josie and No. 1 combined.....	3,013.43
Gross value.....	\$46,239.06
Average number of men.....	47
Underground.....	11
Surface.....	36
Development—	
Raising third compartment alongside working shaft.....	447 feet.
Sinking shaft.....	45 "
Sinking shaft on Annie.....	120 "
Driving.....	1,940 "
Raising.....	107 "
Winzing.....	141 "
Cross-cutting.....	917 "

Additions to plant consist of electric hoist engine.

Surface improvements consist of gravity tramway to railway and ore bins in connection with No. 1 mine.

*No. 1 Mine.*

Tons of ore shipped.....	See "Josie."
Average number of men.....	45
Underground.....	30.59
Surface employees.....	14.41
Development—	
Sinking.....	120 feet.
Driving.....	1,532 "
Raising.....	249 "
Winzing.....	86 "
Cross-cutting.....	251 "

Total value of surface improvements and plant for Josie and No. 1 mine..... \$53,778.05

Additions to plant consist of an electric hoist engine.

Surface improvements—

New head frame.  
Hoist engine room.  
Ore bins and gravity tramway in conjunction with Josie mine.

*War Eagle Mine.*

Tons of ore shipped, year ending Dec. 31st, 1920.....	9,886
Gross value.....	\$142,282.98
Average number of men employed.....	166
Development work.....	4,428 feet.
Value of machinery, buildings, etc. (increase during 1920).....	\$50,000

*Centre Star Mine.*

Tons of ore shipped.....	40,875
Gross value.....	\$609,358.75
Average number of men employed.....	240
Development.....	3,525 feet.
Increase of value of machinery buildings during 1920.....	\$190,000.00

*Lion Mark Mine.*

Tons of ore shipped.....	2,737
Gross value.....	\$43,117.61
Average number of men employed.....	33
Development work.....	2,124 feet

*New St. Elmo.*

Tons of ore shipped.....	" "
Number of men employed.....	6 to 12
Development work.....	1,912 feet.

*California.*

Average number of men employed.....	25
Development—	
Drifting.....	825 feet.
Sinking.....	168 "
New machinery building, etc.....	\$21,150.00

*Sunset No. 2.*

Average number of men employed.....	20
Development during 1900.....	450 feet.

*Homestake.*

Average number of men employed.....	15
Development—	
Shaft.....	210 feet.
Tunnel.....	1,200 "
Cross-cutting.....	900 "

*Velvet.*

Tons of ore shipped.....	Nil.
Average number of miners.....	12
" " surface men.....	20
Development work—Shafts, drifts and cross-cuts.....	
	1,000 feet.
Plant— 2 7-inch Knowles pumps, and 1 1,500-foot saw-mill.	

*Evening Star.*

Number of men employed below surface.....	16
" " above.....	9
Tons shipped.....	348
Gross value.....	\$4,985.50
Development—	
Sinking.....	250 feet.
Drifting.....	475 "
Cost of machinery.....	\$1,800.00

*Green Mountain.*

Number of men employed.....	15
Development—	
Sinking.....	100 feet.
Cross-cutting.....	400 "
Machinery added—	
	20-horse power hoist.
	5-drill compressor.
	2 No. 7 sinking pumps.

*I. N. L.*

Number of men employed.....	11
Tons of ore shipped.....	432
Gross value.....	\$39,800.00
Tunnels and raises.....	480 feet.

*Spitzer.*

Tons of ore shipped.....	106
Gross value.....	\$2,635.00
Average number of men employed.....	6
Shaft.....	50 feet.

*Douglas.*

Average number of men employed.....	4
Tunnelling.....	480

*Northern Belle.*

Number of men employed.....	5
Development—	
Cross-cutting.....	315 feet.
Drifting.....	158 "
Sinking.....	30 "
Tunnelling.....	50 "

*Giant.*

Tons of ore shipped.....	504
Gross value.....	\$6,986.00
Average number of men.....	9
Development work.....	
	300 feet.
Machinery consisting of—	
	An air compressor.
	50-horse power electric motor.
	Hoisting engine.
	2 pumps.
	3 machine drills.
	50-ton ore-bin.
Cost of plant detailed.....	\$10,000.00

*Big Four Group.*

This group consists of four Crown-granted claims, situated on Little Sheep Creek. The work done during the past year consists of 300 feet of tunnel and shaft, 5 men being employed.

*Gertrude.*

This property was worked for a short time during the early part of the year. No returns of amount of work done.

*Bonanza Group.*

Consisting of the Bonanza No. 3, Our Hope, Bonanza No. 3 Fraction, and Our Hope Fraction mineral claims. This is a very promising group, situate on Iron Creek, in the Norway Mountain camp. The property is being worked by the Rossland Bonanza Gold Mining and Milling Company, Limited, non-personal liability, and during the latter part of the year 75 feet of tunnel work have been done on the Bonanza No. 3.

*Cascade Group.*

This is also a very promising group of claims, comprising the Cascade, California, and Royal Kangaroo, and is situated on Grenville Mountain, to the south-west of Norway Mountain. During the past year 130 feet of tunnel work was done. The property is being operated by the Cascade Gold Mining and Milling Company, Limited, of Rossland.

## MINING IN EASTERN ONTARIO.

By PROF. DR. KALIN, Inspector of Mines.

(Continued from July issue.)

### COPPER—NICKEL MINES.

The activity in the copper-nickel district is greater than for many years past, resulting in extensive prospecting, and in the sale of many properties. The work so far done upon these deposits may be said to be quite superficial, however, and the future of deep mining here is quite uncertain. Diamond drill prospecting in depth has yielded mostly negative results, but this is inconclusive evidence of the non-existence of deeper-seated masses of ore. Considering the character and distribution of these deposits it would seem advisable to definitely settle this point by courageous exploration to lower levels than those yet reached.

#### THE CANADIAN COPPER COMPANY.

*Copper Cliff mine.* This mine, the deepest in the district, has been carried down to the thirteenth level, making a depth from the surface of 972 feet, the distance between the twelfth and thirteenth levels being 115 feet. The increase of depth during the year has been 85 feet. A drift has been run from the bottom of the shaft 80 feet southeast. The double track skipway has been extended to the full depth of the shaft.

On the twelfth level some back-stopping has been done in the second stope north 30 feet above the floor of the level. Ore is also being shot down from the third to the tenth level, the open stope extending down so far. The masses broken down are block-holed and mucked out on the tenth level. On the first level the drift was extended a few feet into the hill, and then abandoned.

The pumping system now in use in this mine is as follows: A small Northey pump lifts water from the thirteenth to the twelfth level; here it is lifted by another Northey pump to the tenth level; whence it is sent to the seventh level by a Cameron pump; another Northey pump lifts it to the fifth level, and by a larger Northey pump it is delivered to the surface. A large Knowles pump was about to be installed to lift the water directly from the seventh level to the surface, thus dispensing with the fifth level station.

A new underground dynamite magazine has been constructed in the old ninth level cross-cut. The door is kept locked, and the dynamite and exploders are stored in separate lockers in the magazine. About 100 lbs. of dynamite are stored at a time underground. The magazine is located 30 feet from the shaft, and is maintained in a cleanly condition, and comparatively dry.

An attempt was made to inspect the large stope with the aid of an acetylene lamp, but below the fifth level the atmosphere was too dense to see from wall to wall. The upper part of the stope, however, was clearly revealed and seemed to be secure. It is centrally supported by a rib, or inclined pillar, of irregular shape.

*Lans mine.* This mine has been stripped to the bottom, and is now closed, the pit being nearly filled with water. The engines, boilers, and other machinery have been withdrawn, and the pit and buildings left in a state of safety.

*McArthur No. 1 mine.* Work on the McArthur No. 1, and the south-east end extension, have been suspended and all plant and equipment removed. The pits have been fenced and the property left in safe condition.

*McArthur No. 2 mine.* The contemplated change in location of the shaft has been made. It now dips at a steeper angle, lying chiefly in the footwall back of the original position of the old shaft. It has been double-tracked for skip-haulage to the bottom, with a manway on one side. From the surface to the first level the distance is 130 feet, with an inclination of 42 degrees; and from the first to the second level the distance is 65 feet with an incline of 72 degrees. Work on the first level is nearly finished, the ore having been stoped to the surface leaving an open pit, which extends down to the second level. On the latter, ore was being broken on the sides of the pit and stopes were being extended back toward the footwall. Sinking below the second level was in progress, a solid arch of ore having been left temporarily as a protection over the lower part of this working, hoisting being done through a small opening on one side by means of an auxiliary hoist set up on the first level station.

The changes in the surface plant at this mine consist of a new coal shed erected at the hoisting works, measuring on the foundations 360 feet by 20 feet. A new magazine for explosives has been erected 500 feet southwest of the blacksmith shop. It is built of logs and is kept in good condition.

Scaling of the shaft wall above the manway was recommended and it was also advised to widen the manway near the top.

*Clara Bell group.* Only two of the openings in this group of mines are now being worked, called respectively the South Pit and the North Pit. The South Pit is 40 feet south of the rock house and is 40 feet deep, 60 feet long and 50 feet wide. Hoisting is done by derrick, with a steam hoisting engine. The North Pit begins 100 feet north of the rock house and is 45 feet deep, 60 feet long and 50 feet wide. A skipway extends north from the rock house to the bottom of this pit, receiving also the ore dumped from an upper working higher up the hill. This latter is an open quarry, 35 feet deep at the back, 60 feet wide and 40 feet long. A double track counter-balanced inclined tramway leads down to the lower pit, 180 feet in length. The equipment mentioned in my last report has been set up and is in operation. The dynamite magazine for these mines is located 600 feet west of the rock house, with a rise of ground between. It is built of wood, sealed with tongued and grooved narrow boards, and covered exteriorly with sheet iron, painted black. It is provided with double doors, but has no ventilator. A small preparation house for dynamite is located on the edge of a small pond about 500 feet north northeast of the rock house. This was not kept in as good condition as the other magazine. Greater cleanliness and a safer approach were recommended.

The McDonald mine was no longer in operation.

*Stobie mine.* The only enlargement of this mine since the last inspection has been due to stoping, and this has consisted almost wholly in working back the benches by the underhand methods here employed. The mine has been surveyed and maps made, for the first time revealing the true size and shape of the stopes and their relative positions clearly. The stopes are not superposed so as to weaken each other, and the mine appears safer than would otherwise have been judged. Work is temporarily suspended in the second level stope, and it was recommended to bar access to it by a guard rail. It was further advised to open a larger vent between the third and fourth level stopes, so as to improve the ventilation below.

*No. 3 mine.* This is the same as that previously referred to as the Six and Six mine. Development has been carried on at the westerly deposit by means of a shaft 7 by 17 feet, and 40 feet deep, inclining 62 degrees to the west. The shaft is provided with a manway and a double skipway, the skips being run in balance, operated by a drum in the power house. The shaft extends into a pit 30 feet deep, 65 feet wide and 80 feet long, open to the surface. There is also a stope northwest from the pit, 30 feet wide, 20 feet high and 15 feet long. A raise is being driven from this stope to the surface, to facilitate underground work during the winter.

The rock house is of the ordinary type used by the Canadian Copper Company, and is located just east of the shaft mentioned. It is 36 feet high, with foundations 45 by 26 feet. On the ground floor is located the engine, driving the crusher, screens and picking tables on the second and third floors. A trestle for disposing of waste rock extends 66 feet east from the building. The power house is a frame structure 80 feet north of the rock house. It contains a boiler room, and a hoist and air compressor room. The three boilers and other appliances in this building are those formerly in use at the Evans mine. There is a blacksmith shop 200 feet south of the rock house.

The standard gauge railroad of the Canadian Copper Company to the Stobie mine has been extended from the latter point to the rock house of No. 3 mine.

#### CANADIAN COPPER COMPANY'S SMELTER.

The new construction at the old smelting plant consists of the following: A frame store-house for acids, 30 feet east of the assay office, coal sheds, 45 by 25 feet alongside the railroad trestle north of the old coke sheds; and a boiler house with a 50-foot iron stack, containing two 100 h. p. boilers, located about 40 feet west of the assay office. All five furnaces in the plant were in blast.

The new or west smelter has been finished according to the plans described in my last report. Three furnaces were in blast, and a fourth was being set up. Three Connorsville blowers were in operation, and a fourth was being installed for the new blast furnace.

A small foundry has been built just north of the west smelter, with an ordinary cupola furnace and other accessory plant.

Some changes have been made during the year in the personnel at the mines. Mr. James McArthur remains general manager, but the following new appointments have been made: financial agent, Mr. A. P. Turner; underground superintendent, Mr. John Lawson; master mechanic, Mr. Louis H. Thullen.



The following general recommendations were made:—To employ compressed air for underground pumping, particularly in the deeper levels, and in shaft sinking; to use greater care in keeping magazines clean, to provide all powder men with fuse cutters and cap crimpers; and to adopt a regular system for distributing explosive supplies to miners, so as to avoid sending dynamite into the mines at irregular times and by parties other than those specially appointed for this duty, so far as practicable.

#### GREAT LAKES COPPER COMPANY.

The following development work has been done upon this property during the year: The shaft has been enlarged to a section of 8 by 10 feet, and has been carried vertically to a depth of 71 feet. At a depth of 45 feet an inclined shaft continues at an angle of 45 degrees to the north to a depth of 129 feet from the surface. This is still in process of sinking. One level has been driven at a distance of 75 feet from the surface measured along the vertical and inclined shafts. The east drift is 85 feet long. At a distance of 60 feet from the shaft is a cross-cut 26 feet toward the north. A single acting Knowles pump, with a discharge pipe of 1¼ inches diameter, is located near the shaft in this drift. The west drift is 70 feet long, and also has a cross-cut 28 feet long, starting 52 feet from the shaft and extending in a northerly direction. Hoisting is done by bucket on a skidway. The hoisting works are located 400 feet east of the shaft. The hoisting engine has a single drum, 21 by 22 inches, with steam cylinders 6½ by 9 inches, and winds a ¾-inch steel cable. Power is taken from a 15-h.p. vertical boiler, which also supplies steam to the mine pump. The official signal code is used. The mine is ventilated by a 36-inch fan, located beside the mine mouth, and actuated by an independent engine.

The rock house is erected 300 feet southwest of the smelter, and contains a 15-h.p. engine and boiler and a Gates crusher. The smelter described in my last report is not in operation. A sleeping camp, 60 feet by 48 feet, well appointed in all particulars, has been erected 600 feet west of the smelter, and a boarding house has also been built 100 feet north of the sleeping camp. It was recommended that a larger cable for hoisting be installed without delay.

#### VICTORIA MINES.

This property, owned by Mr. Ludwig Mond, is located about 2 miles west of Whitefish, Algoma. The holdings are the following:—In the township of Denison, concession II, lot 8; concession III, lots 8 and south half of 9; concession IV, lot 8, and the north halves of 11 and 12; concession V, the south halves of lots 6, 8 and 9; in the township of Garson, Nipissing, concession II, the north half of the north half of lots 3, 4 and 5, and the northeast quarter of the north half of lot 6; concession III, the south half of lot 3, south half of lot 4, and the southwest quarter of the south half and the north half of the south half of lot 5. The approximate area is 3,000 acres. The staff consists of Mr. H. W. Hixon, general manager; Mr. W. H. Holland, cashier; Mr. A. B. Hixon, mine captain; and Mr. Jno. Grigg, master mechanic. The Victoria Mines are located about 2 miles north of the new station of the same name on the "Soo" branch of the C.P.R.

Numerous pits have been opened on the vein, which is similar to those occurring near Sudbury. Four of these have been deepened as shafts. The trend of the deposit as revealed by these workings is east and west. The main shaft is called No. 11. It contains two compartments and a manway, with a total cross-section inside timbers of 5½ by 17 feet, and is 92 feet deep. The first level has been run off at a depth of 50 feet from the surface. Shaft No. 11 A is sunk 167 feet east of No. 11. It has only a single compartment and connects with the 50-foot level from shaft No. 11. A pump station is located on this level on the north side of the shaft. Shaft No. 10 is 270 feet east of No. 11 A, and is 45 feet deep. At this depth there is a drift north 23 feet. The first, or 50 foot level connects shafts Nos. 11, 11 A and 12, and extends 53 feet east of No. 11 A. The work is all neatly executed and safe.

A shaft house is in process of construction, which will be 38 feet high from the shaft mouth to the sheave blocks. About 20 feet distant is the rock house, 32 by 27 feet on the foundations, and 30 feet high. A tramway from the shaft house enters above the third floor, on which stands a 9 by 15-inch Blake crusher. On the second floor are the screens and picking tables, and on the first floor are the loading bins for discharging into buckets on the aerial tramway line that will conduct the ore to the roast yards. The power house is situated 20 feet south of shaft No. 11. It is divided into an engine room, 30 by 30 feet, and a boiler room, 30 by 20 feet. In the engine room is a duplex 50 h. p. double drum hoisting engine, winding a ¾-

inch steel cable, a straight line 5-drill Rand air compressor, and a 20 h.p. horizontal engine for driving the machinery in the rock house. In the boiler room are three boilers, all of the locomotive type, one of 45-h.p. and two of 60-h.p. A blacksmith shop is located 150 feet east of the power house. The main dynamite magazine is 900 feet north of the shaft house, with a high hill between. It is built of logs and contains about six tons of dynamite. The explosives preparation house is 450 feet northeast of the shaft house, and contains about one box of dynamite at a time. Blasting is done entirely with the battery. The mine office is situated about 600 feet south of the shaft house, and near by are the assay office and lodging houses for the workmen. General offices, residences, warehouses, etc., are being erected at Victoria mine station.

An aerial tramway is being installed by the Trenton Iron Company of Trenton, N.J. This will be 11,000 feet in length, taking ore from the rock house to the roast beds near Victoria mine station. A smelter is also being erected on a siding from the C.P.R. at the station, and will contain two cupalo furnaces, two converters and accessory plant.

#### GERTRUDE MINE.

The development of the Gertrude mine has been continued as indicated as indicated below. Shaft No. 1, with a cross-section of 8 by 12 feet, has attained a depth of 120 feet. At a depth of 47 feet a drift has been extended 50 feet south. The second level has been established at a depth of 102 feet. The south drift has been run 70 feet, and the north drift 20 feet. The lower 18 feet of the shaft constitute a sump. No. 2 shaft lies 3,300 feet west of No. 1. It maintains a cross section of 8 by 12 feet to a depth of 80 feet. Both Nos. 1 and 2 shafts were closed at the time of my visit. No. 3 working is a drift mine, located 600 feet west of No. 2. It consists of a tunnel 65 feet long. This tunnel was not well drained, and connecting wire was used for leading wire for blasting. Recommendations were made touching both these matters. A 15 h.p. boiler was temporarily set up for supplying steam to the drill used in the tunnel. The exhaust was conducted by a pipe to the surface.

A temporary log power-house was located 150 feet northwest of shaft No. 2, containing a duplex single-drum hoist, and a 60 h.p. boiler of locomotive type. A new hoist and air compressor for permanent work were on the ground but not set up. A dynamite magazine has been erected 1,000 feet east of No. 1 shaft, in which were stored 3 tons of dynamite. Fuse and caps were kept in a storehouse near the boarding camp. The store and boarding house were located 600 feet southwest of No. 1 shaft.

The Manitoulin and North Shore Railway has been graded from Sudbury to a point near the Gertrude mine, a distance of about 12 miles. A spur is now being built to the mine, a mile and a quarter long. On the completion of the line from this point to Sudbury, which will be accomplished by the spring of 1901, active operations will be commenced at the Gertrude mine.

*To be continued.*

## LONDON AND BRITISH COLUMBIA GOLDFIELDS.

The report of the directors of the London and British Columbia Goldfields, Limited, for 1900, presented to the meeting on the 17th inst., states that a very large number of properties and options were under examination and consideration during the year 1900, but as few were found to possess any sure indication of success without an undue amount of risk, none were acquired; the past year's work was therefore principally devoted to the further development and strengthening of the company's assets previously held. The option on the Lardeau property, referred to hereafter, was acquired since the date of these accounts.

#### THE YMIR GOLD MINES.

One of the company's principal assets is still represented by shares in this company, the enhanced value of which is fully demonstrated by that company's improved position and the large profits now being made from month to month.

During 1900 extra stamps and other machinery have been installed, whereby the revenue earning capacity of the mine has been more than doubled. The cost of this machinery, etc., was entirely met out of the profits of that year.

Ore reserves have been blocked out for a depth of about 400 feet, and the vein sunk on for a further depth of 200 feet or more, where it was found to carry similar widths and values to that above.

A tunnel is also being driven for the purpose of working the mine at a depth of 1,000 feet below the surface, and is expected to be completed by the end of this year.

The present operating profits amount to about £5,000 per month.

Practical bulk experiments have also taken place proving the suitability of cyanide to the treatment of the tailings, from which a further monthly profit of nearly £1,500 is expected.

The London and British Columbia Goldfields Company's share-holding in this company is a considerable one, forming a valuable asset which the directors are anxious to, as far as possible, retain.

## THE WHITEWATER MINES.

The London and British Columbia Goldfields Company's share interest in this mine remains practically the same as at the end of 1899.

The miners' strike did not terminate until February, 1900, and as some difficulty was then experienced in getting a suitable labour force together, it was not until somewhat later that the mine was able to resume shipments, which, however, were again suspended at the end of last year owing to the action of the American Smelter Combination in refusing to renew their contracts for dealing with the silver lead ores of the district.

This latter circumstance was unfortunate, occurring as it did just at the time when the mine had commenced to pay dividends which, from the appearance of the developments then being carried out, gave every promise of continuance.

From these and more recent developments our engineers report the mine as looking far better than it has done for a long period previously.

Under these latter circumstances, and in view of the assistance recently granted to the local silver lead smelters by the Canadian Government, your directors look forward to an early settlement of the question and a resumption of shipments which it is believed would soon put the company again in a dividend-paying position.

## THE ENTERPRISE (BRITISH COLUMBIA) MINES.

At this mine also the miners' strike prevented work from being carried out until about the end of February, 1900, when a sufficient labour force was procured and mining operations were commenced as soon as possible.

These operations soon revealed the fact that it was not practicable to handle and separate the ore by means of hand sorting without undue expense and considerable loss, and consequently steps were taken for the erection of a suitable concentrator for the mechanical treatment of the ore, pending which only small shipments have been made and work principally confined to the further development of the mine.

These developments have been satisfactory in largely adding to the ore reserves previously opened up.

The shares held by the London and British Columbia Goldfields Company in this company remain practically the same as when last reported.

## THE RUTH MINES.

It will be remembered that the principal vein on this property which in the early history of the mine produced such large quantities of rich ore was cut off by a huge fault, and appeared to be lost altogether. A considerable amount of development work has since been carried out for the double purpose of again finding the vein, and in looking for others, with the result that two strong veins of high grade have recently been opened up, which it is believed will entirely restore that company's original position, and greatly enhance the value of the interest held by the London and British Columbia Goldfields Company, which remains the same as when last reported.

## THE YUKON GOLDFIELDS.

The working conditions have, however, so much improved that, with the reduced royalty tax and the change made in the company's local management, better results are anticipated from this season's work.

The London and British Columbia Goldfields Company's interest in this company has been taken into the accounts at a very low figure in order to derive the full benefit of any improvement in the general position.

## THE KETTLE RIVER POWER COMPANY.

This company has been formed to carry out and develop the concession of the provincial Cascade Company for utilising the Cascade Falls of the Kettle River for the purpose of generating and supplying electricity for power to the towns, mines, smelters, and other undertakings within a radius of 40 miles of Grand Forks City. Within this area are contained the Rossland and Boundary Districts, already the most important mining districts of British Columbia.

The advancement of the Boundary District has recently been so appreciable that it is confidently expected that that district alone will require more power than the Kettle River Power undertaking will be able to supply when developed to its full capacity.

The large margin between the cost of generating steam power and that at which the Kettle River Power Company is able to provide power, ensures a substantial profit to the undertaking.

As the result of these arrangements the London and British Columbia Goldfields Company will hold debenture stock to the value of the works already completed, together with an exceedingly large block of ordinary shares, which form an asset of great value, thus establishing the deal as being an exceedingly satisfactory one.

## THE ALMA GROUP OF CLAIMS.

These form a group of four claims consisting of about 150 acres adjoining the Ymir mine on its western side, and into which the Ymir vein runs should its general direction—as at present opened up—be maintained.

As the Ymir Company have allowed their option over these claims to lapse, steps have been taken by the London and British Columbia Goldfields Company for definitely opening up the Ymir vein on the Alma group, the importance of which is obvious.

## GROUP OF CLAIMS—LARDEAU DISTRICT.

This is a large and exceedingly important free milling gold property, situated in the Lardeau district of British Columbia, and easy of access. The London and British Columbia Goldfields Company has recently secured a working option on the property upon terms which appear to be very satisfactory, and the work of opening up the mine is now in progress.

There exists upon the property several large and distinct veins varying in width from 3 to 55 feet, upon three of which work has been done, and all carry gold values varying from a few dollars to the ton to that of very high grade ore.

## NEW COMPANIES.

## ONTARIO.

**Beaver Oil & Gas Company, Ltd**—Incorporated 26th July. Authorized capital \$250,000, in shares of \$50.00. Head Office: Brantford, Ont.

**Canadian Oil Refining Company, Ltd.**—Incorporated 7th August, 1901. Authorized capital \$100,000, in shares of \$100.00 each. Head Office: Petrolia, Ont.

**Kent Oil & Gas Company, Ltd.**—Incorporated 7th August, 1901. Authorized capital \$50,000, in \$10 shares. Head Office: Dresden, Ont.

**Ontario & California Oil Company, Ltd.**—Incorporated 7th August, 1901. Authorized capital \$1,000,000, in 25 cents shares. Head Office: Toronto, Ont.

## BRITISH COLUMBIA.

**Fraser River Gold Dredging Company, Ltd.**—Incorporated July 11th, 1901. Authorized capital £15,000. Formed to acquire options for and to purchase and obtain leases or concessions of gold mines and timber in British Columbia. Head Office: 14 Arcade St., Ipswich, London, England.

## COMPANY NOTES.

**Scottish Colonial Gold Fields.**—At the meeting of the Scottish Colonial Gold Fields, which was held recently at Edinburgh, reference was made to the Idaho-Alamo group of properties in the Slocan in which the company is interested. The directors intend to erect an aerial tramway which will be completed by next summer, and in the meantime intend to push developments in the mine. Arrangements have been made to provide an additional sum of £12,000 as working capital, by selling a portion of the company's interest in Australian undertakings. The Board anticipates regular dividends from their Slocan property, when thoroughly equipped and developed.

**The Hall Mining and Smelting Company.**—The mine manager reports that the main shaft is finished down to the tenth level, and that he is now driving on the ninth and tenth levels eastward, to reach the ore bodies found in the levels above. Copper Smelting: There being now sufficient ore in sight, the Board decided to start the small furnace (No. 1) on copper ore from the Company's mine, and the furnace was blown in on the 9th instant.

**Brandon and Golden Crown.**—The shareholders of the Brandon and Golden Crown Mining Company have agreed to reorganize on an assetable basis. The new undertaking, to be known as the Golden Crown Mines, Limited, will be capitalized in the same sum as the old concern, viz.: 1,500,000 dollars. The dollar shares, however, will only be paid up to 95 cents when issued in exchange for the old stock, and the balance will be called up in monthly instalments as the directors deem advisable. By this means a working capital of 75,000 dollars will be provided, a sum thought to be sufficient to fully demonstrate the merits of the property. The mine, previous to its being closed down, sent out to the smelter something over 2,000 tons. The freight and treatment rate, however, was such that the directors did not feel justified in paying it any longer, especially as the smelter company at that time declined to reduce the figure unless a contract for a specified tonnage was entered into, or unless the entire output of the mine was sent to the Trail smelter for one year at a fixed rate. With the working fund to be provided to continue development, shipments will not be necessary to raise money for this purpose, and consequently the best efforts of the management will be confined to exploiting the property with a view to making it a mine. Besides the old 322-foot tunnel the Golden Crown is developed by a main shaft down a depth of 322 feet, with drifts at the 100, 150 and 250-foot levels. To date the total number of feet of work done is 2,443.

**Le Roi Mining Company.**—The secretary has addressed an important communication to the *Financial News* in which he states: The financial position of the company on June 1st, as follows:—

<i>Assets.</i>	
Matte in transit to refinery.....	\$400,000
Matte in course of treatment.....	150,000
Ore in smelter yard.....	431,200
Ore purchased.....	60,000
Supplies, coke, etc.....	25,000
Expenditure on capital account.....	37,000
New construction smelting works.....	12,500
	<b>\$1,115,700</b>
<i>Liabilities.</i>	
Debt to Bank of Montreal.....	\$380,000
Advance from bank on second-class ore dump.....	150,000
Monthly expenses.....	219,900
	<b>\$749,900</b>
Balance assets over liabilities.....	365,800
	<b>\$1,115,700</b>

**Granby Consolidated.**—The first ordinary meeting of the company for its election of directors and other business was held in Montreal on the 26th instant. Good progress in the work of enlarging the smelter is being made. The labor troubles in the United States however have delayed the completion of some of the machinery. One carload of electrical machinery arrived

this week, and two additional carloads, with other machinery, are expected before Saturday. The power house is being enlarged and the extended foundations have been completed. The power plant will be increased by a 250 horse power horizontal turbine water wheel and a 250 horse power electric generator directly connected with the water wheel, making a total of 850 horse power developed for the use of the smelter. This is exclusive of the 250 horse power developed for the city of Grand Forks, the total power thus developed on the Kettle river being 1090 horse power. There will also be added an additional triplex power pump, which will supply an additional 750,000 gallons of water daily for granulating the slag and for the water jackets. The enlargement of the smelter building is also in progress. It will contain two furnaces, making the total capacity 1,300 tons daily. The new No. 5 gyrator crusher in the sampling works will increase the crushing capacity 1,000 tons daily. The converter building now being erected will be a steel fireproof structure 160 x 68 feet, its height in the main portion being 35 feet. The contract for its construction was awarded to the Hamilton Bridge Company of Hamilton, Ont. This building will contain two stands of converters of the horizontal barrel type. The shells will be 72 inches in diameter by 100 inches in length. Each stand will have three extra shells. This building will contain a 40-ton electric travelling crane for handling the shells and matte; in another portion of the building will be a 20-ton reverberatory tilting furnace. In the same building there will also be the quartz crushing plant and grinding pan for mixing the converter linings. Under each converter stand will be three mould-carriers, and these will be operated back and forth by a hydraulic ram. The converters as well as the tilting furnace will also be operated by hydraulic power. Near by the converter building will be the engine room, in which will be located the blowing engine for blowing the converters; also the hydraulic pump which will furnish the pressure to operate the various machines in the converter building. The blowing engine will be run by a belt from a 20 horse power alternating motor. It is of the power type, has an air cylinder 36 x 36 inches and has a special unloading device attached, so that when the pressure reaches a maximum of 12 pounds the valves are so arranged that they remain open and no power is consumed when the converter is not using air. This unloading device was especially built for the Granby company, and has never been used on any low pressure blowing engine employed for converter purposes.

**St. Eugene Consolidated.**—Charles Biesel, superintendent of the St. Eugene states that a crew of 90 men is employed in the mine on development exclusively. The work in hand consists of sinking on the Lake Shore and the extension of the horizontal workings on the other claims comprising the St. Eugene. The big concentrator is shut down, and it is probelmatical when it will resume. The London market for lead shows no signs of imdprovement; in fact there is a decline rather than otherwise.

**The Ymir Gold Mines.**—The directors have declared a further interim dividend of 1s. per share, free of income tax, payable on the 24th instant. The secretary adds:—I am also pleased to say that a mail to hand yesterday confirms in the most satisfactory manner the information cabled and published on the 25th ultimo with regard to the rich developments in No. 4 level. Careful tests of samples taken from the cars as they came from No. 4 level (600 feet below the surface) showed a value of over £8 to the ton of ore for a width of 15 feet. The importance of these developments will at once be apparent when it is recalled that the average value of the ore from which past profits have been derived was only about £2 10s. per ton.

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**British Columbia Copper Co.**—This company owning the Mother Lode mine, has ordered another furnace for its smelter at Greenwood. The new furnace will be similar in construction to the one now in operation and which has had an uninterrupted and very successful run ever since it was first blown in, on February 18th of the current year. It is a stack furnace, the down take going from 12 feet above the feed floor up some 15 feet and then down into the big main dust flue. The size of the furnace is 42 inches wide by 150 inches long, inside dimensions at tuyeres, of which there are 10 at each side, of 3 inches diameter. The Allis Chalmers company (successors to the E. P. Allis Co., who manufactured the first furnace), of Milwaukee, Wis., are building the new furnace, the construction of which will take about 60 days. Allowing for time that will be occupied in delivery at Greenwood, and in construction, it will be between three and four months before the new furnace will be ready for operation. There is very little preliminary work to be done at the smelter, provision having been made at the first for two more furnaces. The steel furnace house will have to be enlarged, but the floor and the dust flue are ready for the putting in of the additional smelting facilities the new furnace will afford. The engines and boilers are sufficiently large to run three or four furnaces, but another blower will have to be added to provide for the increasing treatment capacity of the works. The nominal capacity of the furnace in use has frequently been stated in print as 225 tons. Its actual tonnage of ore treated since its blowing in is as follows: February, (10 days) 3,016 tons; March, 10,519 tons (daily average); April, 11,322 tons (daily average), 377½ tons; May, 11,830 tons (daily average, 381½ tons); June, 11,206 tons (daily average, 373½ tons). Total tonnage to June 30th, 44,877 tons; daily average for four months ended June 30th, nearly 398 tons.

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(Sg'd) **RICHARD HARCOURT,**  
Minister of Education.

TORONTO, Ontario, Canada, June 1901.

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Full particulars of the work, salary, etc., may be obtained from the Secretary.

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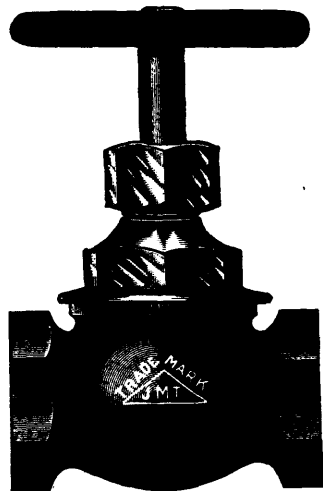
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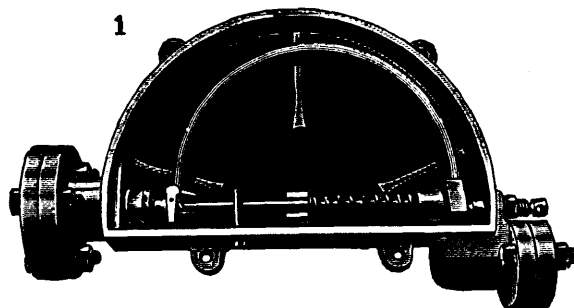
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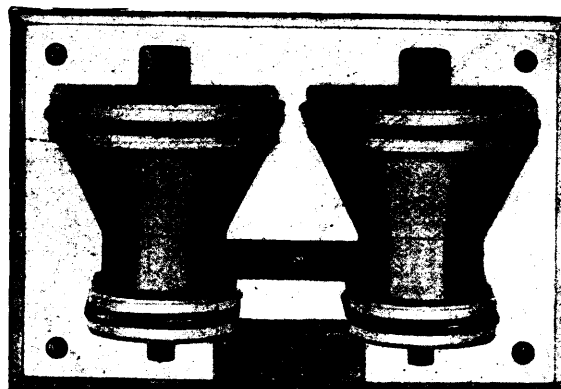
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ORNAMENTAL AND STRUCTURAL MATERIALS IN ABUNDANT VARIETY.

The Mining Law gives absolute security to Title, and has been  
specially framed for the encouragement of Mining.

Mining concessions are divided into three classes :—

1. In unsurveyed territory (*a*) the first class contains 400 acres, (*b*) the second, 200 acres, and (*c*) the third, 100 acres.

2. In surveyed townships the three classes respectively comprise one, two and four lots.

All lands supposed to contain mines or ores belonging to the Crown may be acquired from the Commissioner of Colonization and Mines (*a*) as a mining concession by purchase, or (*b*) be occupied and worked under a mining license.

No sale of mining concessions containing more than 400 acres in superficies can be made by the Commissioner to the same person. The Governor-in-Council may, however, grant a larger extent of territory up to 1,000 acres under special circumstances.

The rates charged and to be paid in full at the time of the purchase are \$5 and \$10 per acre for mining lands containing the superior metals\* ; the first named price being for lands situated more than 12 miles and the last named for lands situated less than 12 miles from the railway.

If containing the inferior metal, \$2 and \$4 according to distance from railway.

Unless stipulated to the contrary in the letters patent in concessions for the mining of superior metals, the purchaser has the right to mine for all metals found therein ; in concessions for the mining of the inferior metals, those only may be mined for.

\*The superior metals include the ores of gold, silver, lead, copper, nickel, graphite, asbestos, mica, and phosphate of lime. The words inferior metals include all other minerals and ores.

Mining lands are sold on the express condition that the purchaser shall commence *bona fide* to mine within two years from the date of purchase, and shall not spend less than \$500 if mining for the superior metals ; and not less than \$200 if for inferior metals. In default, cancellation of sale of mining lands.

(*b*) Licenses may be obtained from the Commissioner on the following terms :—Application for an exploration and prospecting license, if the mine is on private land, \$2 for every 100 acres or fraction of 100 ; if the mine is on Crown lands (1) in unsurveyed territory, \$5 for every 100 acres, and (2) in unsurveyed territory, \$5 for each square mile, the license to be valid for three months and renewable. The holder of such license may afterwards purchase the mine, paying the prices mentioned.

Licenses for mining are of two kinds : Private lands licenses where the mining rights belong to the Crown, and public lands licenses. These licenses are granted on payment of a fee of \$5 and an annual rental of \$1 per acre. Each license is granted for 200 acres or less, but not for more ; is valid for one year, and is renewable on the same terms as those on which it was originally granted. The Governor-in-Council may at any time require the payment of the royalty in lieu of fees for a mining license and the annual rental—such royalties, unless otherwise determined by letters patent or other title from the Crown, being fixed at a rate not to exceed three per cent. of the value at the mine of the mineral extracted after deducting the cost of mining it.

The fullest information will be cheerfully given on application to

THE HON. THE COMMISSIONER OF COLONIZATION AND MINES,  
PARLIAMENT BUILDINGS, QUEBEC, P. Q.



**PROVINCE OF NOVA SCOTIA.**  
**Leases for Mines of Gold, Silver, Coal, Iron, Copper, Lead, Tin**  
—AND—  
**PRECIOUS STONES.**

**TITLES GIVEN DIRECT FROM THE CROWN, ROYALTIES AND RENTALS MODERATE.**

**GOLD AND SILVER.**

Under the provisions of Chap. 1, Acts of 1892, of Mines and Minerals, Licenses are issued for prospecting Gold and Silver for a term of twelve months. Mines of Gold and Silver are laid off in areas of 150 by 250 feet, any number of which up to one hundred can be included in one License, provided that the length of the block does not exceed twice its width. The cost is 50 cents per area. Leases of any number of areas are granted for a term of 40 years at \$2.00 per area. These leases are forfeitable if not worked, but advantage can be taken of a recent Act by which on payment of 50 cents annually for each area contained in the lease it becomes non forfeitable if the labor be not performed.

Licenses are issued to owners of quartz crushing mills who are required

to pay Royalty on all the Gold they extract at the rate of two per cent. on smelted Gold valued at \$19 an ounce, and on smelted Gold valued at \$18 an ounce.

Applications for Licenses or Leases are receivable at the office of the Commissioner of Public Works and Mines each week day from 10 a.m. to 4 p.m., except Saturday, when the hours are from 10 to 1. Licenses are issued in the order of application according to priority. If a person discovers Gold in any part of the Province, he may stake out the boundaries of the areas he desires to obtain, and this gives him one week and twenty-four hours for every 15 miles from Halifax in which to make application at the Department for his ground.

**MINES OTHER THAN GOLD AND SILVER.**

Licenses to search for eighteen months are issued, at a cost of thirty dollars, for minerals other than Gold and Silver, out of which areas can be selected for mining under lease. These leases are for four renewable terms of twenty years each. The cost for the first year is fifty dollars, and an annual rental of thirty dollars secures each lease from liability to forfeiture for non-working.

All rentals are refunded if afterwards the areas are worked and pay royalties. All titles, transfers, etc., of minerals are registered by the Mines Department for a nominal fee, and provision is made for lessees and licensees whereby they can acquire promptly either by arrangement with the owner or by arbitration all land required for their mining works.

The Government as a security for the payment of royalties, makes the royalties first lien on the plant and fixtures of the mine.

The unusually generous conditions under which the Government of Nova Scotia grants its minerals have introduced many outside capitalists, who have always stated that the Mining laws of the Province were the best they had had experience of.

The royalties on the remaining minerals are: Copper, four cents on every unit; Lead, two cents upon every unit; Iron, five cents on every ton; Tin and Precious Stones, five per cent.; Coal, 10 cents on every ton sold.

The Gold district of the Province extends along its entire Atlantic coast, and varies in width from 10 to 40 miles, and embraces an area of over three thousand miles, and is traversed by good roads and accessible at all points by water. Coal is known in the Counties of Cumberland, Colchester, Pictou and Antigonish, and at numerous points in the Island of Cape Breton. The ores of Iron, Copper, etc., are met at numerous points, and are being rapidly secured by miners and investors.

Copies of the Mining Law and any information can be had on application to

**THE HON. C. E. CHURCH,**  
Commissioner Public Works and Mines,  
HALIFAX, NOVA SCOTIA.



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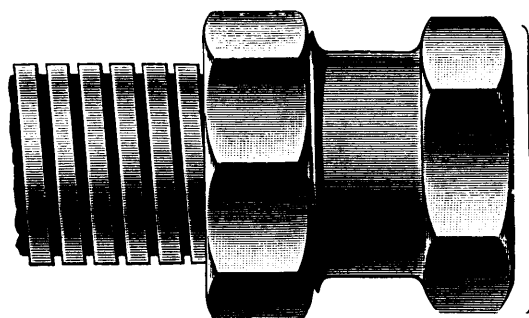
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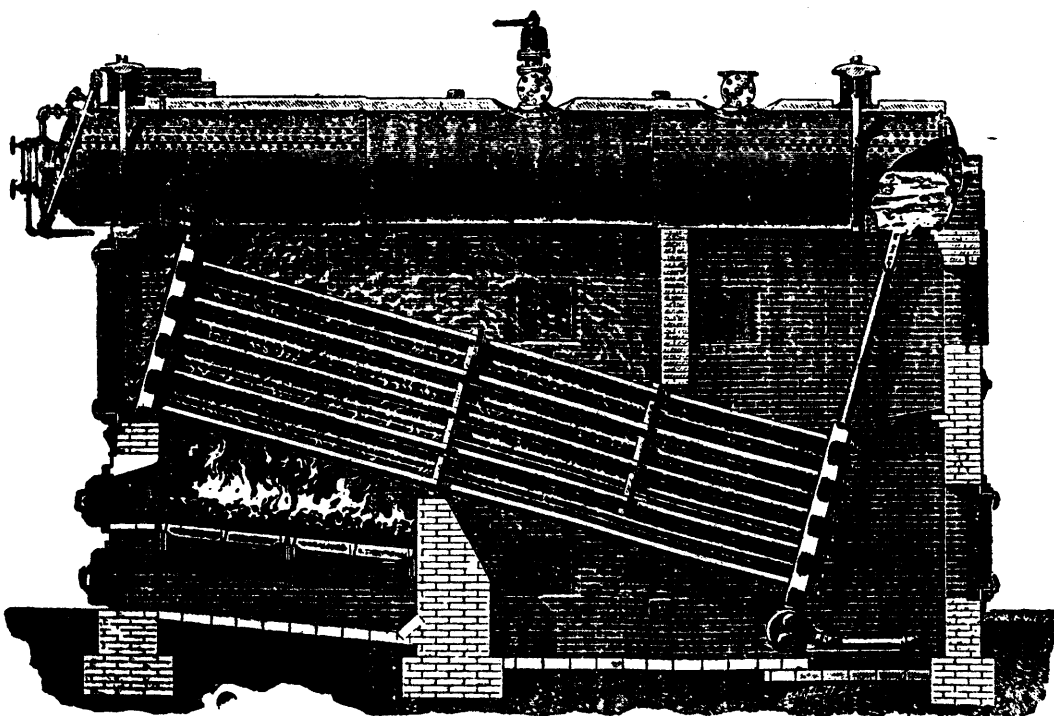
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