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TWENTY-SECOND YEAR OF PUBLICATION

The CANADIAN MINING REVIEW

Established 1882

Vol. XXIII--No. III.

OTTAWA, MARCH 31st, 1904.

Vol. XXIII--No. III.

 <p>AIR COMPRESSORS GAS</p>	<p>THE CANADIAN RAND DRILL CO SHERBROOKE, QUE. BRANCH OFFICES IN MONTREAL, QUE. TORONTO, ONT. HALIFAX, N.S. ROSSLAND, B.C. RAT PORTAGE, ONT. GREENWOOD, VANCOUVER, B.C.</p>	 <p>ROCK DRILLS</p>
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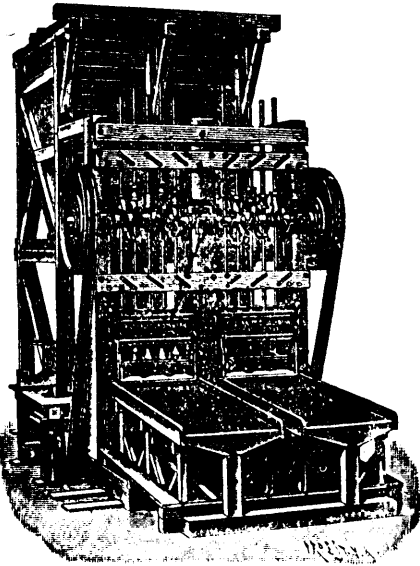
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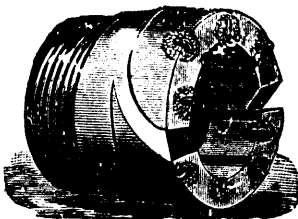
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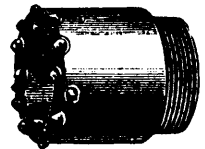
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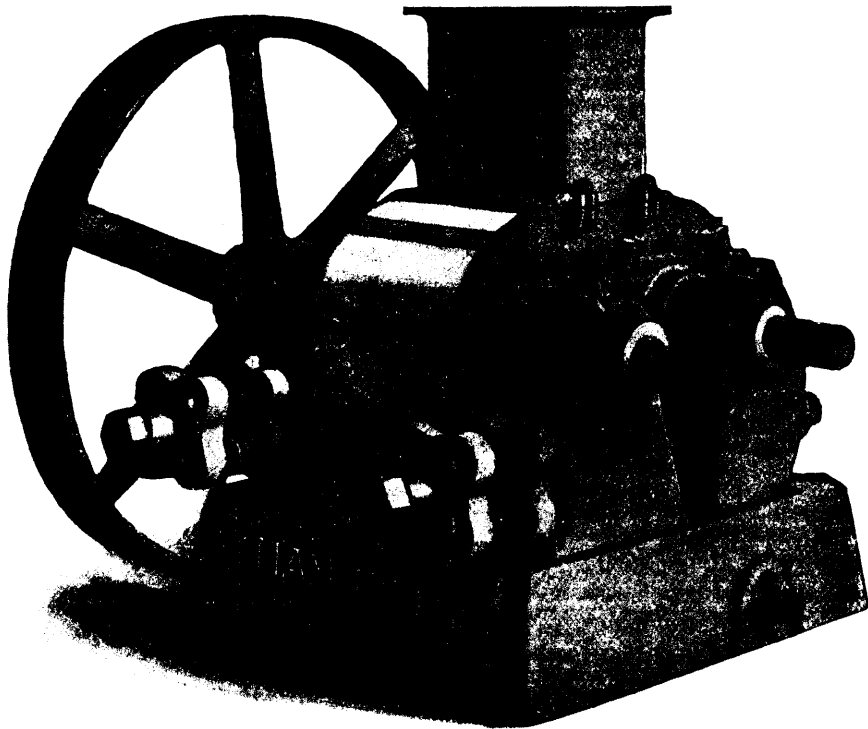
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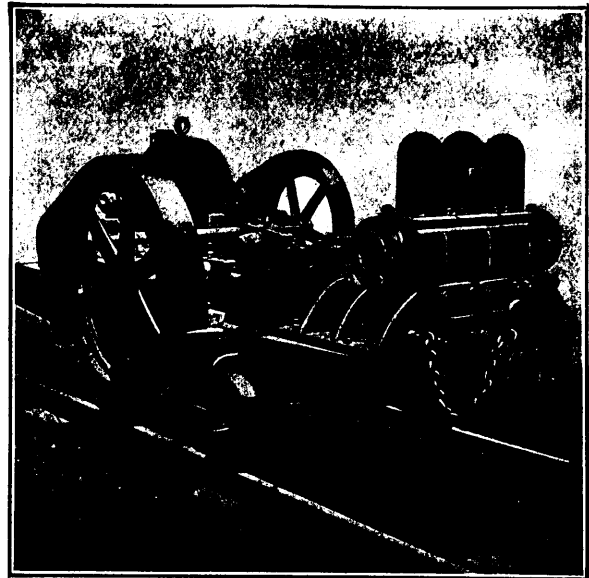
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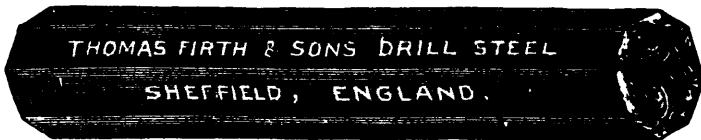
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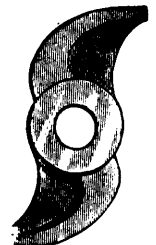


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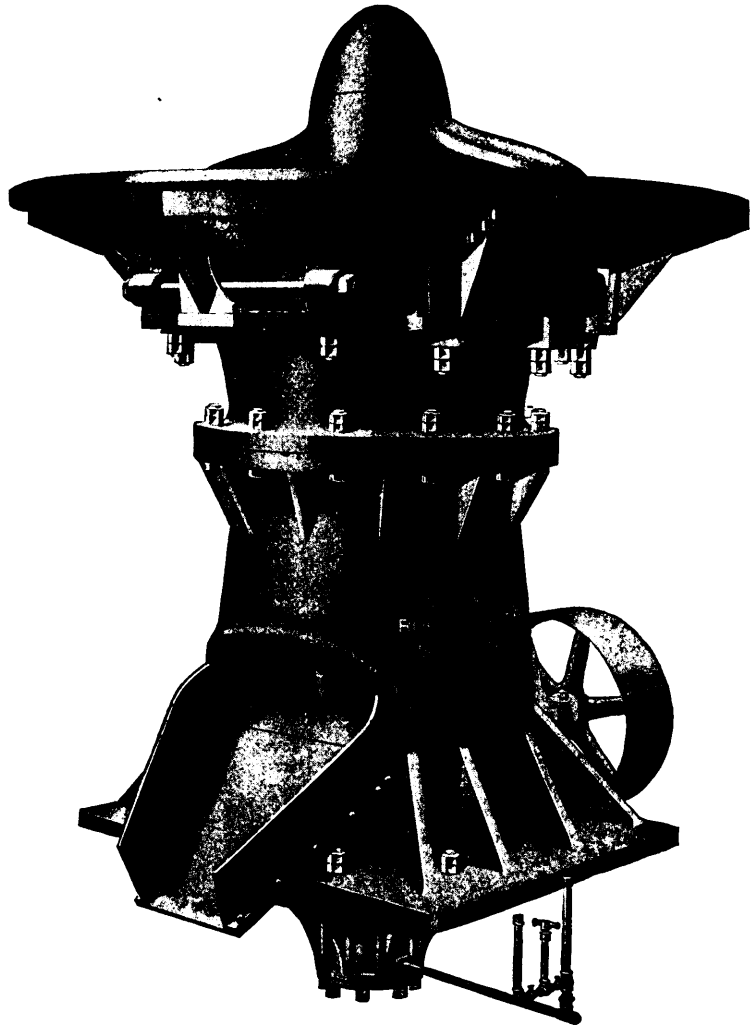
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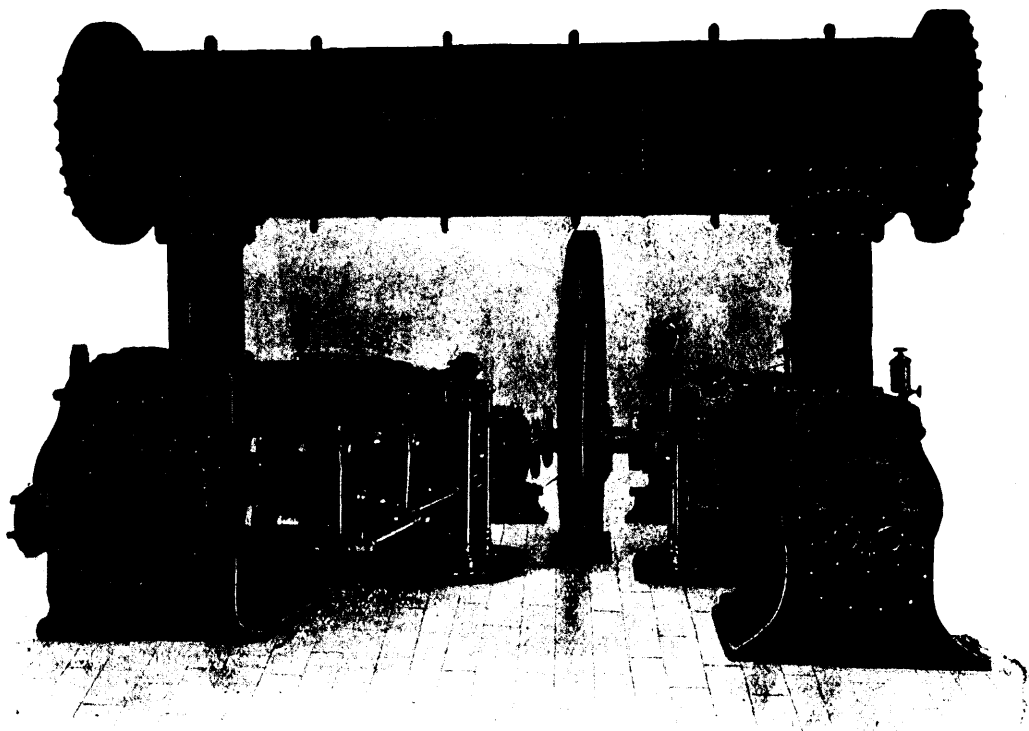
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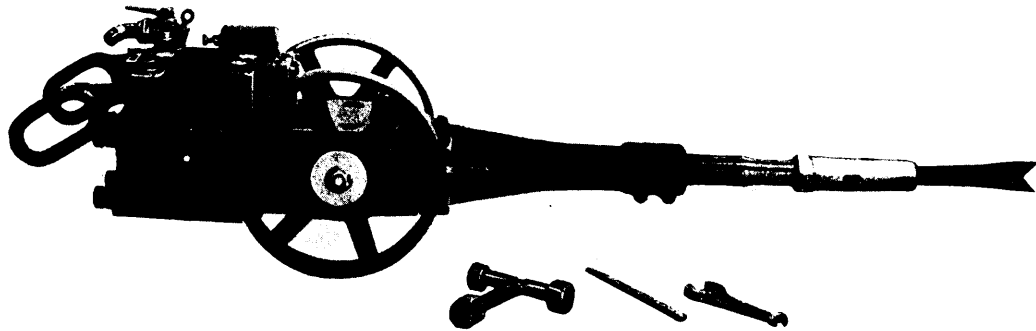
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310,000 IND. HORSE-POWER AT WORK

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PATTERNS FROM 20 HORSE-POWER UP TO 2,000 HORSE-POWER.

WALKER BROTHERS have constructed 700 Air Compressing Engines, with Steam and Air Cylinders ranging from the smallest sizes to 72 in. diameter, including 350 from 30 in. to 70 in. diameters.

One installation, in process of construction, has four Steam Cylinders (Corliss type) and four Air Cylinders.

The Low-pressure Steam Cylinders are 64 in. diameter, the Low-pressure Air Cylinders are 58 in. diameter. Steam Pressure, 140 lb. per square inch; Air Pressure, 100 lb. per square inch.

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Messrs. WALKER BROS.,
Loftus Mines, Loftus in Cleveland, R.S.O.,
3rd December, 1901.

Dear Sirs,—I have much pleasure in stating that the air compressing machinery, supplied by you in 1891 and 1897, to Pease and Partners, Ltd., Loftus Ironstone Mines, has given every satisfaction.

The valves of the air cylinders are remarkably good, and have never given any trouble or needed repairs. The compressor is a double horizontal compound engine, steam cylinders, 28 in. and 48 in. diameters, air cylinders, 40 in. diameters by 72 in. stroke.

The compressed air is used for rock drilling, hauling, and pumping underground.—Yours faithfully,
For Pease and Partners, Ltd.,
W. MOORE, Manager.

[NOTE.—These engines have four steam cylinders and two air cylinders.—WALKER BROS.]

The United Alkali Co., Ltd., Chief Engineer's Office,
Widnes, 23rd December, 1901.

Messrs. WALKER BROS., Pagefield Ironworks, Wigan.

Dear Sirs,—In reply to your enquiry of the 29th November, we have pleasure in being able to state that your blowing engines have given us great service and satisfaction.

We have had for several years quite a number of your large blowing engines in operation, driven direct by both single and cross compound arrangement of steam cylinders.

We consider that the arrangement of the "Walker" valves on the compressor cylinders is a valuable one, possessing the merit of simplicity and efficiency, while giving a large throughway with a small clearance space.—Yours faithfully,
For the United Alkali Co.,
EDWARD J. DUFF, Chief Engineer.

[NOTE.—See the number and dimensions of the compressors referred to in the list of users in our catalogue. The steam and air cylinders are nearly 70 in. number, from 20 in. to 50 in. diameter.—WALKER BROS.]

Barrow Haematite Steel Company, Limited,
Barrow-in-Furness, 7th October, 1901.

Messrs. WALKER BROS., Pagefield Ironworks, Wigan.

Dear Sirs,—I have much pleasure in stating that after a long experience of your Bessemer blowing cylinders, extending over 15 years, we find the valves perform their work most satisfactorily, and they are most enduring; indeed, we cannot speak too highly of their performance or life.—Yours faithfully,
For Barrow Haematite Steel Company, Limited,
J. M. WHILE, General Manager.

[NOTE.—The various blowing engines (air compressing engine) referred to above include several air cylinders 48 in. diameter.—WALKER BROS.]

Messrs. The GLENGARNOCK STEEL AND IRON COMPANY write, in November, 1901, after 15 years' experience of Walker Bros' blowing engines, having air compressing cylinders 54 in. diameter by 6 ft. stroke:—"These engines have given us every satisfaction."

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S. PEARSON AND SON, Contractors.

Blackwall Tunnell Works, East Greenwich, S.E.,
May 10th, 1897.

Messrs. WALKER BROS., Pagefield Ironworks, Wigan.

Dear Sirs,—We are pleased to confirm what we told you verbally the other day, viz., that we consider the air cylinders and valves of your compressors to be the best for such work as we have been carrying out on the above contract.

One of your engines ran for almost a year without stopping, and it gives us great pleasure to thus testify to the good qualities of the plant which we purchased from you.—We are, Dear Sirs, yours faithfully.

(Signed) pro S. Pearson and Son, E. W. MOIR.

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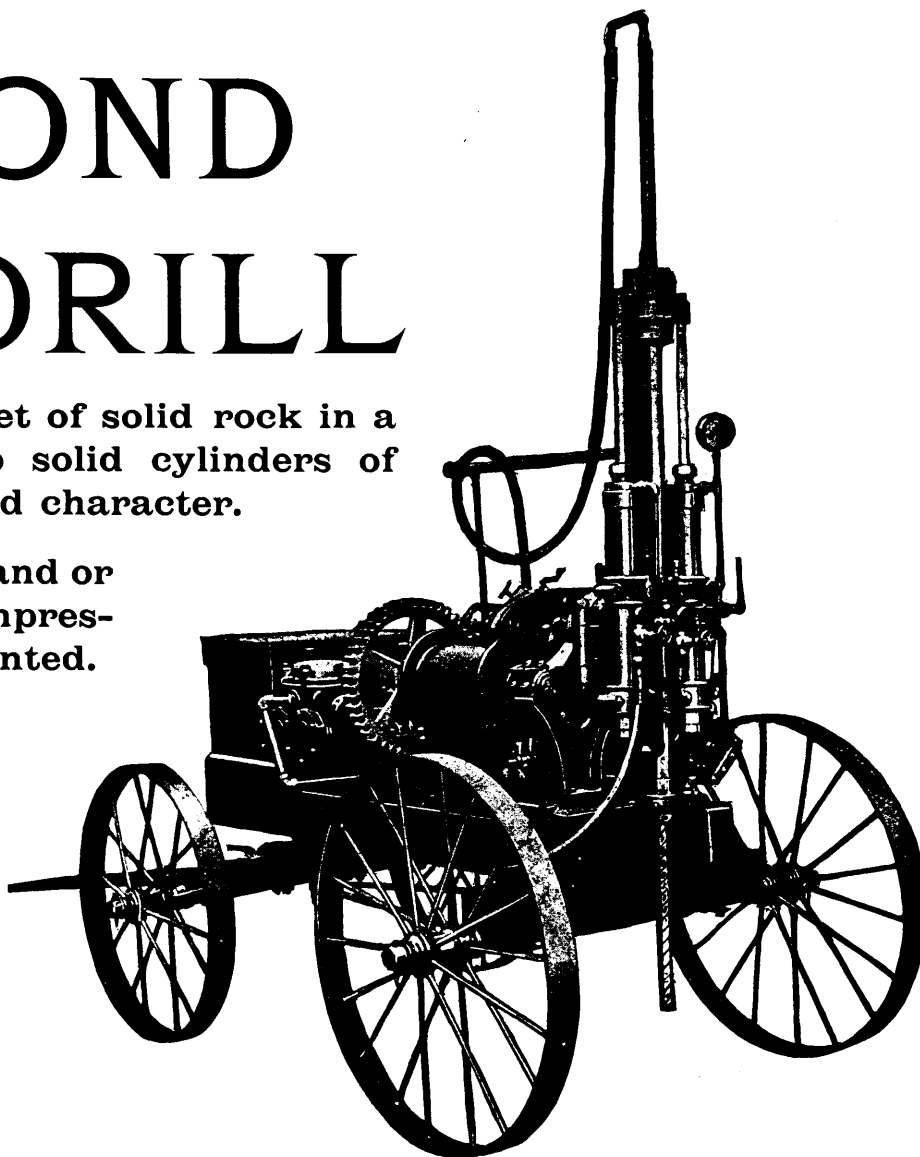
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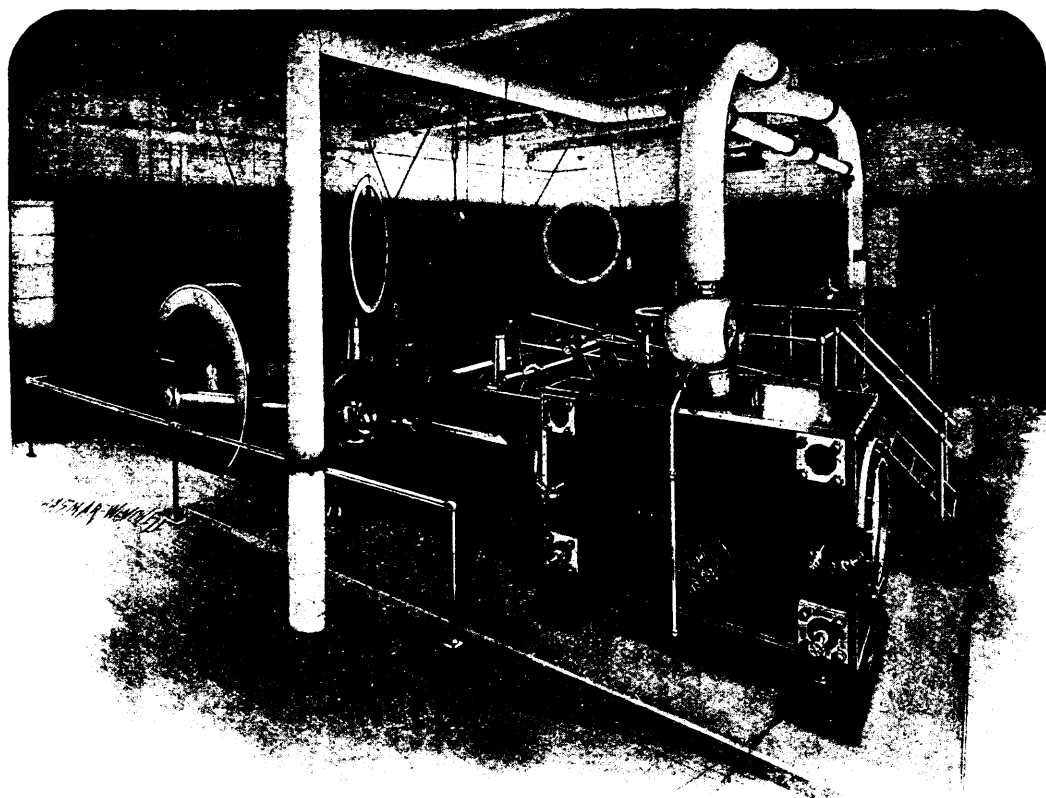
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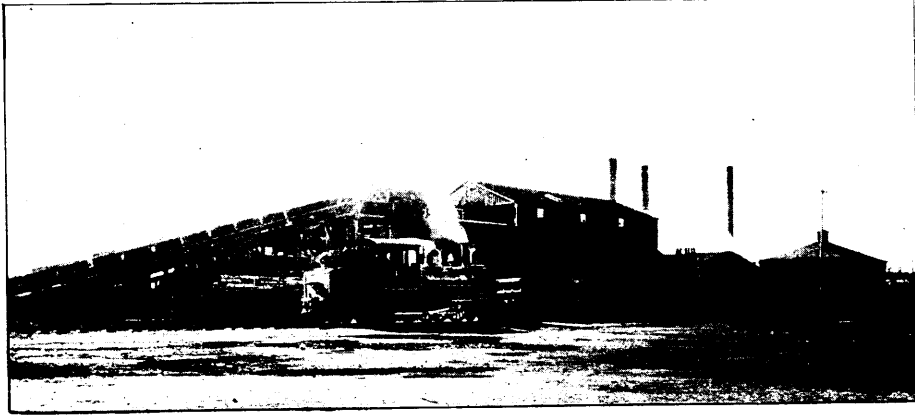
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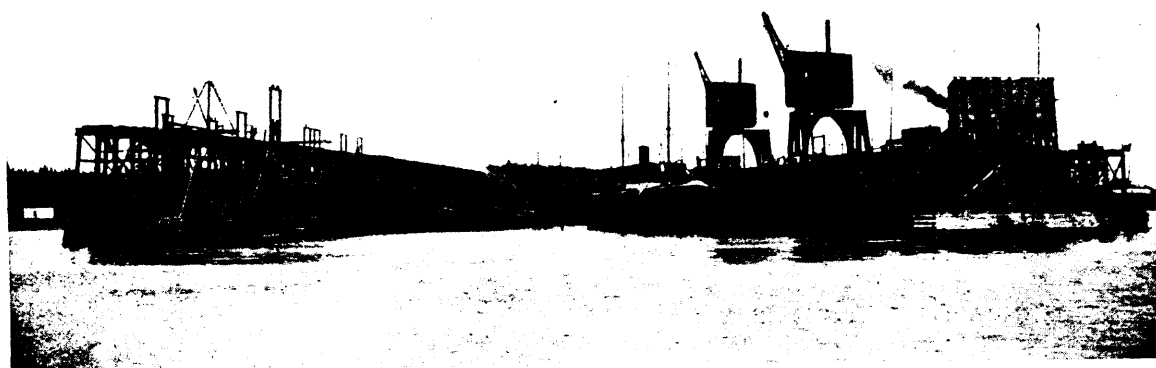
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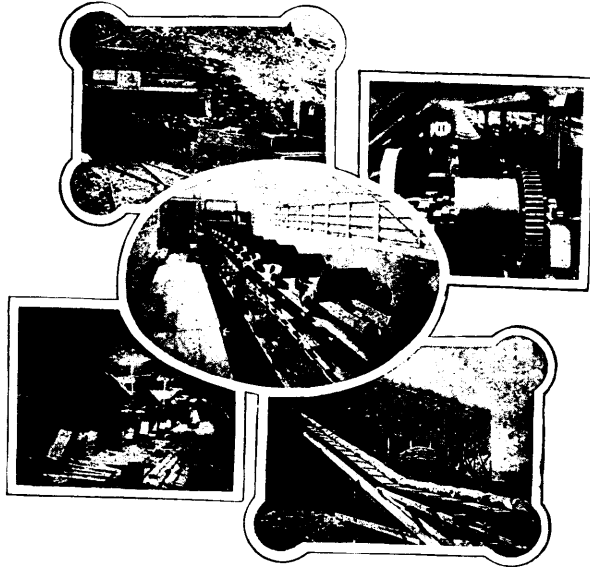
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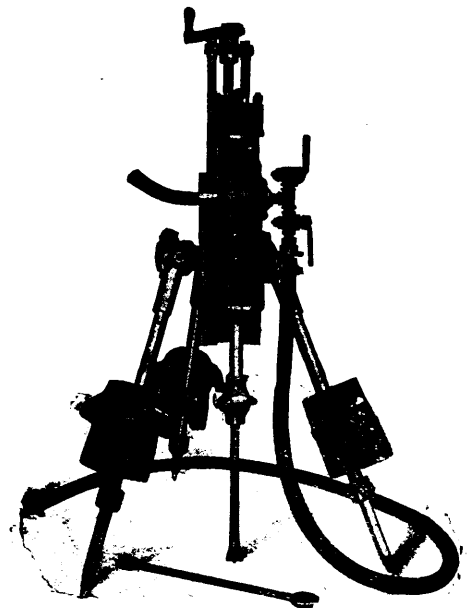
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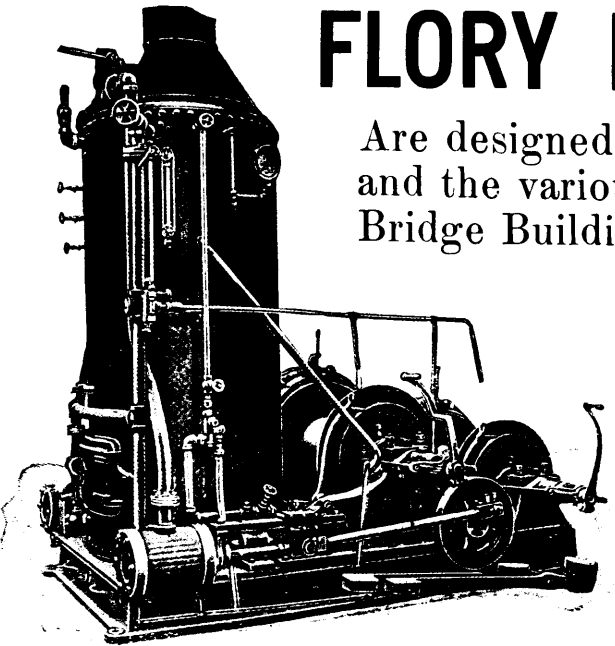
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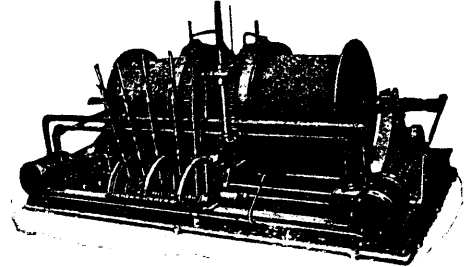
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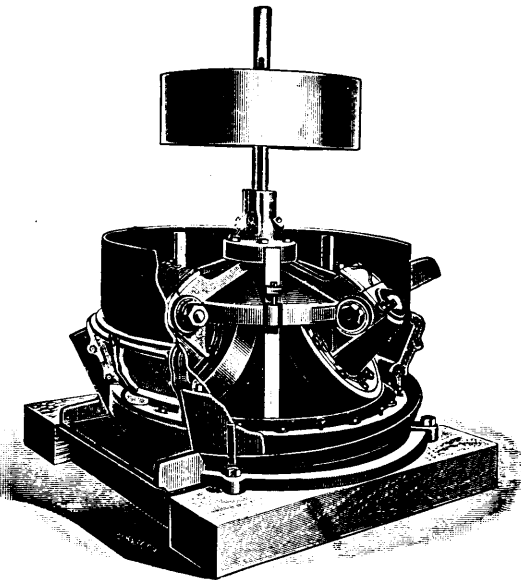
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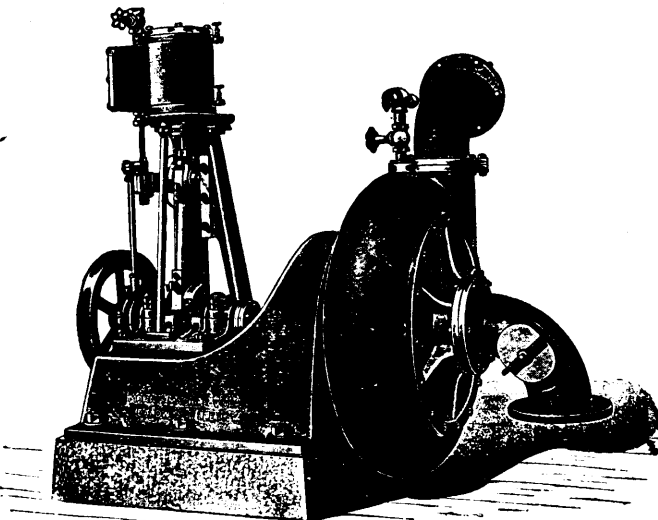
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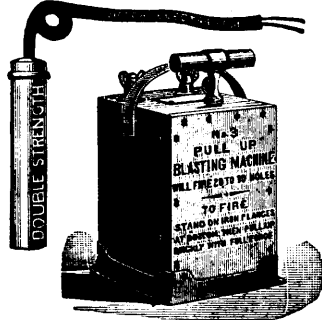
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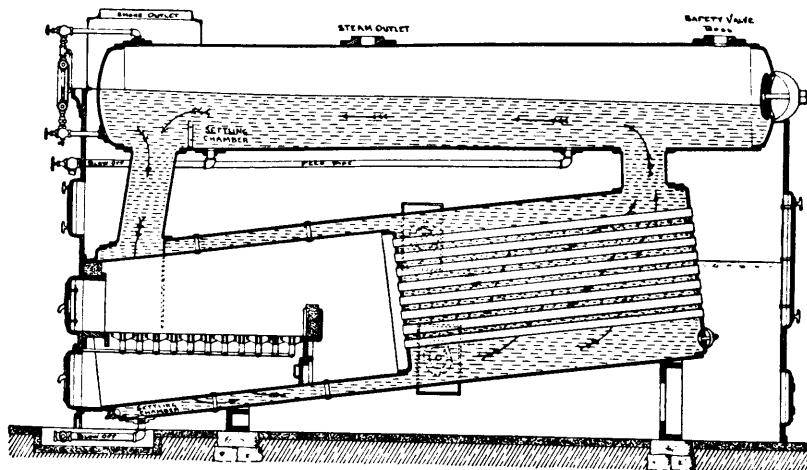
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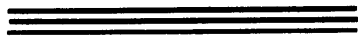
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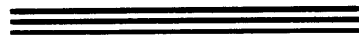
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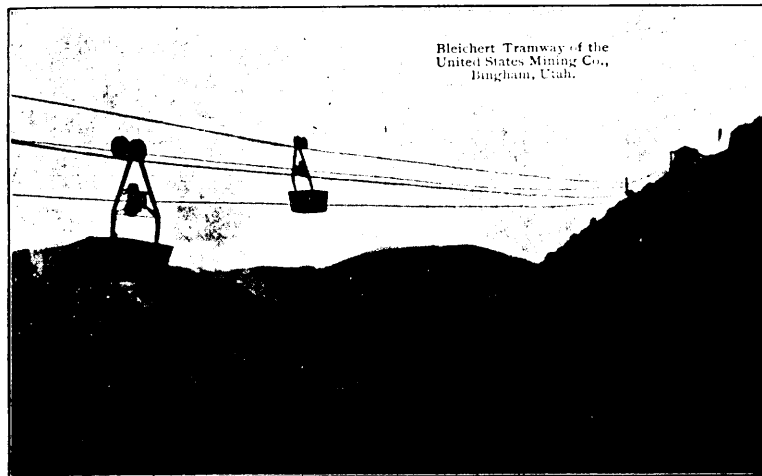
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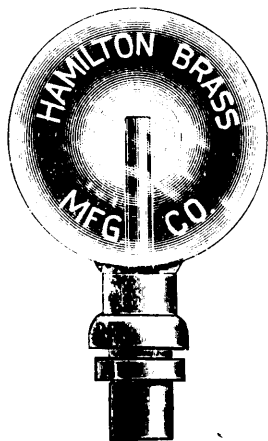
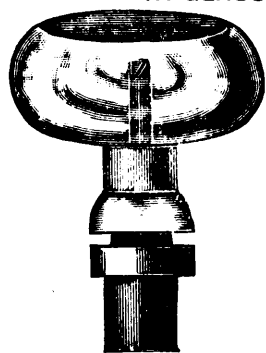
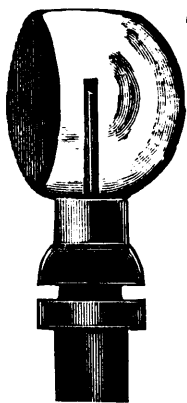
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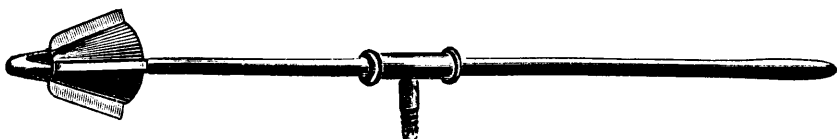
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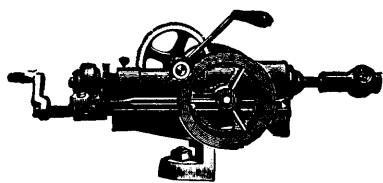
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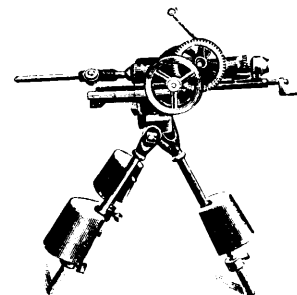
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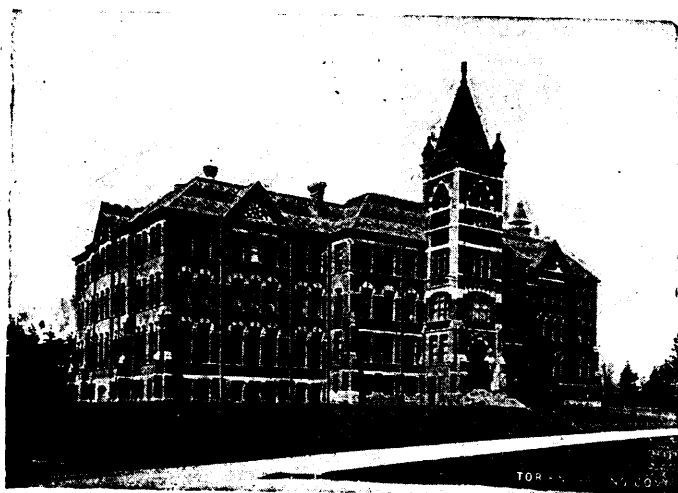


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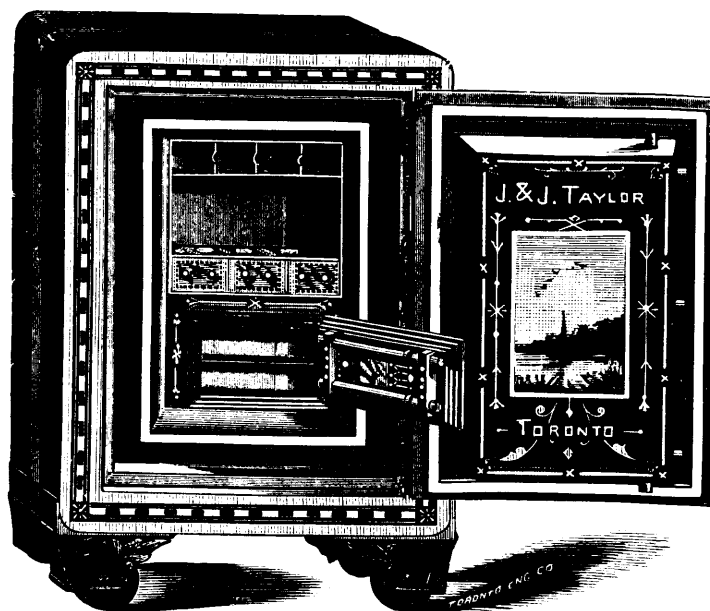
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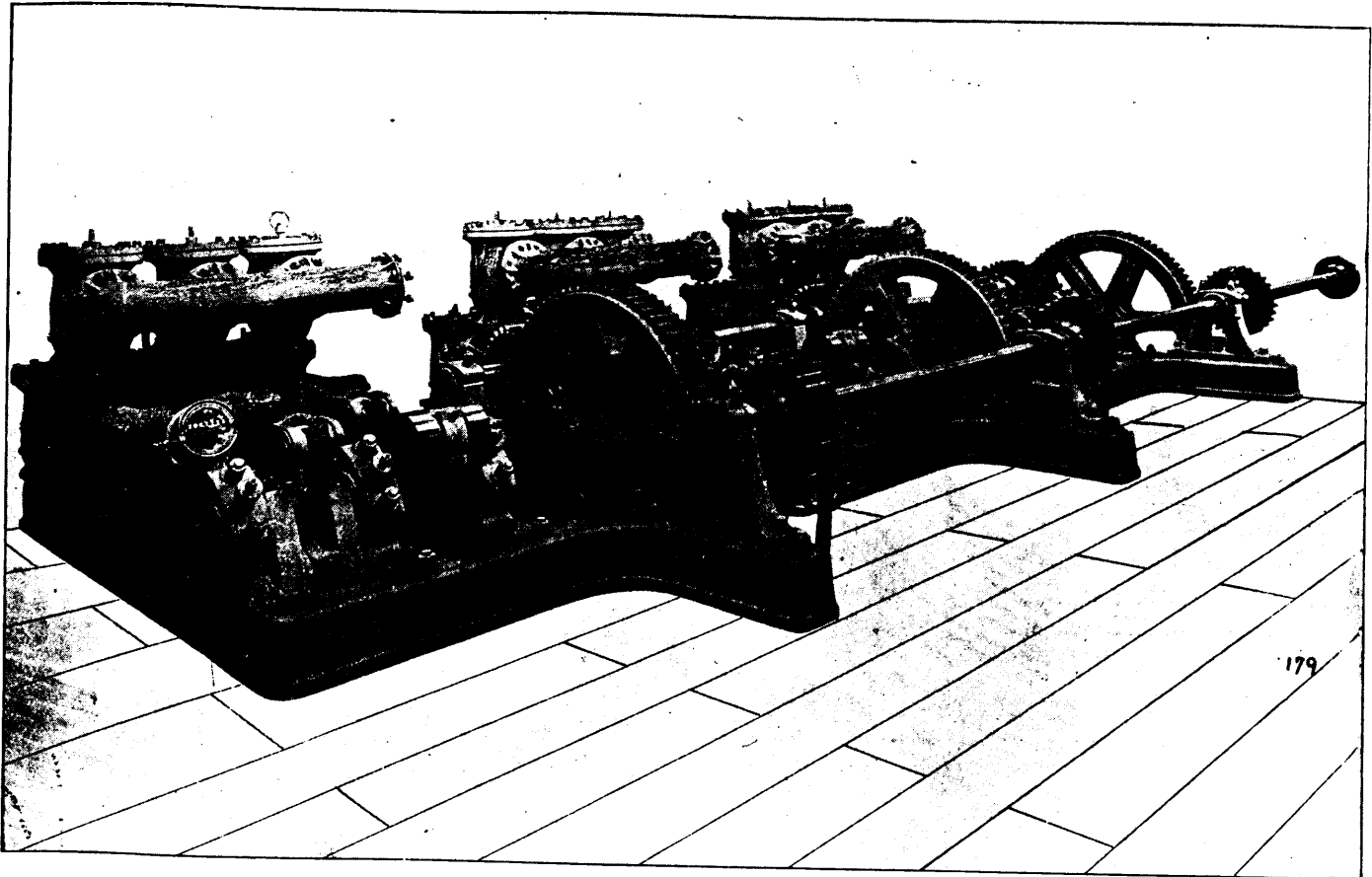
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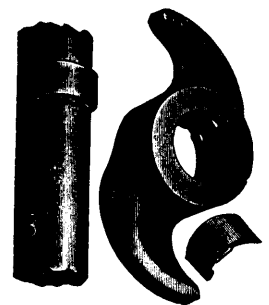


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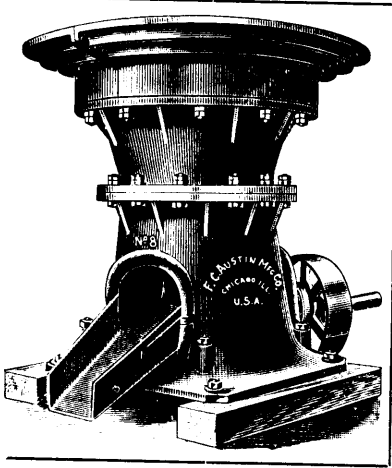
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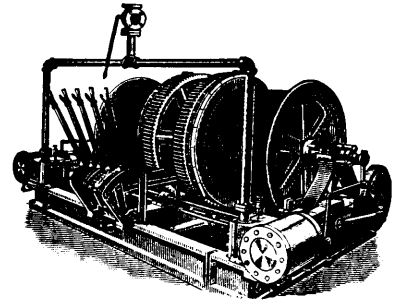
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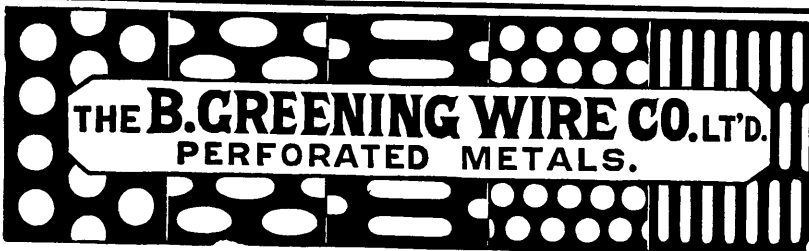
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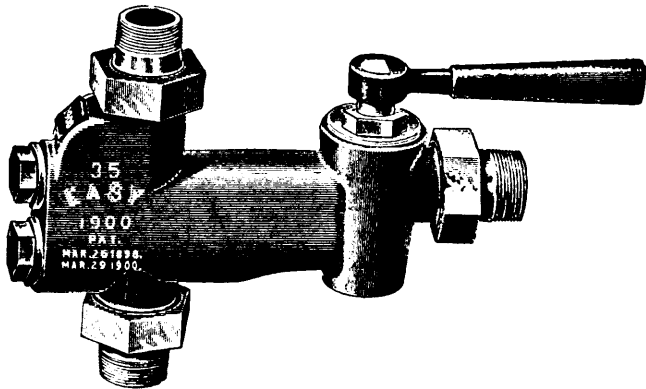
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THE CANADIAN MINING REVIEW

Established 1882

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

Estate of B. T. A. Bell, Proprietor.

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Announcement.

Announcement is herewith made to the readers, subscribers and advertisers of the CANADIAN MINING REVIEW that the publication of the REVIEW will be continued for the present by the Estate of the late Mr. B. T. A. Bell.

It will be the object of the present management to continue the high character and disinterestedness of the paper, and to carry forward the work which the late proprietor had so much at heart.

Biographical Notice of B. T. A. Bell.

The relations of Benjamin Taylor Bell to the CANADIAN MINING REVIEW, and to the Mining Institute, justify the publication of an extended notice of his life, and of the loss which the mining industry has sustained in his death.

He was born at 44 India Place, in the Parish of St. George, Edinburgh, on the 2nd day of July, 1861. His father was Dr. David Bell, and his mother, Margaret Taylor. Owing to the curious fact that there was another Benjamin T. Bell at school with him, the letter

A was introduced into his name solely as a distinguishing mark at school, and to his friends and intimates he was better known as "B. T. A." than by any other name.

His early education was received in the private schools of Edinburgh, and was completed at Stewart's college in that city. As a boy he developed that independence of thought and quickness of action which characterised him as a man and which was early shown in his educational career by his decision that *seeing life* was better than *schooling*. The sequel to this decision was a hasty journey, unknown to his parents, to the city of London whence his return to the city of his birth was summarily accomplished by his father, who, in good old Scotch fashion, spared not the rod. The recital of this incident by Mr. Bell to his intimates was always told with a keen relish of the humor of the situation.

As a result of this incident, the young man served a limited time with the engineering firm of D. & J. Greig. After the death of his mother, and at the age of 21, he decided to leave the old country and see something of life in the Colonies. In the Spring of 1882 he landed at Halifax, N.S., and travelled immediately west to Brandon, Manitoba, in company with four other "cannie scots," who began western life in a tent on the prairie outside of the town. In this tent they lived until October when the "shack" they had builded was finished. Finding through hard experience, that farming, even on a partnership basis, required some capital he turned his hand to any jobs that came along and found himself quite famous as a canvas sign painter.

In 1883 he secured a clerkship in the Freight Department of the Canadian Pacific Railway, at Winnipeg, and was thereby brought into quite close relationship with Mr. John M. Egan, then General Superintendent of the Western Division of that railway. He remained with the railway until the summer of 1884. When at Rat Portage with Mr. Egan in that year the Manitoba Contingent of the Canadian Voyageurs, bound for the Nile, passed through the town en route for Egypt. Seeing some of his old chums amongst the contingent, and full of youth, patriotism and daring, he at once handed in his resignation to Mr. Egan, was enrolled by the officer commanding, (Colonel Kennedy) and in less than six hours from the entrance of the contingent into Rat Portage, he was en voyage as one of that gallant band of voyageurs who did honor to themselves and to their country in the Soudan war for the relief of the christian martyr, General Gordon. For service in this campaign Mr. Bell received the Egyptian Medal and Star.

On the termination of the Soudan expedition he returned to London with the contingent, was there discharged from service and at

once left with a friend (Mr. Lawrence J. Clark, now of Calgary) to do a walking tour through the Caledonian Canal district.

In 1885 he returned to Canada, landing at Montreal where he was attached to the Prince of Wales Rifles, serving as lieutenant, and expecting to see fighting in the so-called Riel Rebellion. The Rifles, however, were never ordered into active service, and he took up newspaper work, assuming the editorship of the *Athletic News*, a sporting paper of that day. He also did occasional work on the staff of the *Montreal Gazette* and *Montreal Witness*, and, on the occasion of his visiting Ottawa in 1886 with a cricket team, he was asked by one of the proprietors of the *MINING REVIEW*, Mr. W. A. Allan, to assume the editorship of that paper.

The *MINING REVIEW* at that time consisted of 6 or 7 pp. of reading matter, chiefly obtained by the aid of scissors and paste pot, and was ostensibly devoted to the furtherance of the phosphate mining industries. It was then owned by Mr. W. A. Allan and Mr. Grant Powell, and the absence of the latter gentleman in England was the occasion for the need of an editor.

To the privileged few who have seen the complete files of the *MINING REVIEW* from its first number, the energy and devotion of Mr. Bell are obvious. He put his unrivalled vitality into the work, and the results have been apparent. In 1887, his name first appeared on the paper, and shortly afterwards he became joint proprietor with Mr. Allan; in January 1896 he became the sole proprietor of the paper.

The fearless criticism of the *REVIEW*, its outspoken condemnation of fraudulent promotions, and its hostility to underhand methods, have been the characteristics familiar to all readers under Mr. Bell's editorial rule. For the first ten years of his control the *REVIEW* averaged one action for libel in each year, no one of which was sustained, and the private letters on the file of the paper, as well as the published comments of other journalists, at home and abroad, show the esteem in which the *REVIEW* has been held. Whatever its failings the *REVIEW* has been marked for years with the label "our columns cannot be bought."

As an organizer and a magnetic force B. T. A. Bell best showed his ability in the various associations and institutes of mining men with which he was connected. When the taxation measure known as the "Mercier Mining Act" was passed in November, 1890, the mine owners of Quebec Province were aroused to joint action, and the General Mining Association of Quebec was formed in the following January. Of this association Mr. Bell was the Secretary and backbone.

Prior to this organization there had been formed in Nova Scotia the "Gold Miners Association" in the month of March, 1888. After a year's successful experience this association, on the 6th of March, 1889, adopted a resolution making the *CANADIAN MINING REVIEW* its official organ, and Mr. Bell was afterwards a frequent visitor at its meetings. Realising the value of concerted action in legislative matters, as shown in the three years successful work of this small provincial organization, he was successful in the establishment of the General Mining Association of the Province of Quebec.

The following year the coal owners in Nova Scotia, being adversely affected by proposed and enacted legislation, united with the gold men into the Mining Society of Nova Scotia; at the second meeting Mr. Bell was present, and by his speeches and personal magnetism effected a co-operation though no amalgamation, with the General Mining Association of the Province of Quebec.

In 1894 he formed a Mining Institute in Ontario, and in January 1896 he realized the dream of five years in getting all the provincial

organizations to combine into one formation which was known as "The Federated Canadian Mining Institute."

After three annual sessions of this Federation the present Canadian Mining Institute was born, which has thriven and grown under the advice and protection of its late Secretary to the magnitude of an important and influential technical body whose suggestions are heeded in every Parliament in the Dominion, and whose published volumes are sought for by Governments, Societies and individuals, from Manila and Australia to California and South Africa.

For fourteen years he devoted his best energies and his talented abilities to the construction and maintenance of an institution within which should be included every technical man, and every monied man whose interests were in mining and metallurgical matters, throughout the Dominion of Canada; the volumes of the Canadian Mining Institute are a portion of the monument to his memory which he himself built, and the love and esteem of his Institute fellow-members is a yet more enduring, and beautiful memorial to his kindly disposition, to his helpful hand, and to his masterly knowledge of human nature.

He was always an enthusiastic sportsman and athlete, his favorite game being cricket, in which he obtained considerable eminence. When playing with the Canadian team in 1886 he made the highest aggregate score known in Canada, totalling that season 1306 runs for 36 completed innings. He also was a member of the Canadian Eleven chosen to visit England in 1886, and also played on the Canadian International Eleven.

In January 1889, he married Sydney, the eldest daughter of Henry F. MacCarthy, Esq., of Ottawa, to whom was born, in June 1890, one son, Gerald Gordon Bell.

In no spirit of exaggeration, and with strict deference to the truth may it be said that no man in Canada can fill his place. Persistent, enthusiastic, dominant, he exercised an influence which was positively unique in this Dominion. And, as the years roll by, the loss which the whole country has sustained in the death of Benjamin Taylor A. Bell will be revealed to all citizens as it now is revealed to those who knew him and loved him well.

The War Eagle Report.

The Seventh Annual Report of the War Eagle Mining and Development Company, Ltd., was submitted at the Shareholders' meeting held on the 23rd of last month.

There are no substantial changes in the accounts which are favorable to the financial position of the corporation, the balance of loss being \$278,274.92 for 1903, against \$508,615.39 for 1902.

It is gratifying to note that the net proceeds from ore sales were increased some \$110,000 over the sales for 1902.

The tonnage mined was the largest in the history of the mine, not even excepting the period ending December 31st, 1899, when the change in the mining year made the figure then tabulated the product for 15 months instead of 12 months. The average monthly tonnage for 1903 was in excess of 5,000 tons, while in 1889 the monthly tonnage was a little less than 5,000.

The assay value for 1903 was \$13 per ton; in 1902 (the lowest of previous years) it was \$18.79—a shrinkage of \$5.79 per ton. This value is the lowest yet recorded for the mine.

The balance of the report is largely on the lines of the Centre Star Report to which full reference was made in the columns of the *REVIEW* for December last. The success of any concentration method means as much for the shareholders of the War Eagle Company as for anyone, and it will be of untold value in the rehabilitation of British Columbia investments into the good graces of mining investors.

The Crow's Nest Pass Coal Company.

The annual meeting of the Crow's Nest Pass Coal Company was held in Toronto on the 12th of February when the Seventh Annual Report of the Directors was submitted. The Report shows in the Profit and Loss Account the very large item of \$913,526.25 as a "Premium received on calls paid on new stock"; the previous amount from this source received was, we believe, \$812,209, making a total revenue from the premiums on the sales of new stock (to date) of \$1,725,735. This amount is strong evidence of the favor in which the stock is regarded by the public, and the record of the Company must constitute the justification for this high premium, either in the cash profits which have been earned, or in the unquestioned prospects of immediate profits in the future. It would appear from the statements of the President and Vice-President, made at the Annual Meeting, that the demand for both coal and coke is steadily increasing; this is evidenced by the construction of 492 additional coke ovens which were commenced in the year 1903, 252 being at Michel and 240 at Morrissey, bringing the total number of ovens, when the new ones are completed, up to the number of 982.

The output for the year must be considered satisfactory, especially in view of the curtailment in production owing to strikes and the explosion. The tonnage mined in 1903 was 661,118 as against 442,049 for the year 1902. The increase in coke production has also been notable, the output of the ovens in 1903 being 167,989 tons against 121,000 tons in 1902, or an increase of 38 per cent.; the increase in the output of coal was nearly 50 per cent. It is now admitted by the consumers in British Columbia that the supply of coal and coke is in excess of the demand, and, should consumers exercise ordinary business prudence and lay in large stocks of both coal and coke, the closing down of the furnaces of the Province through lack of fuel brought about by strikes and explosions, will not be probable in the future.

The report of the Directors does not give the amount of sales made to the different markets, but the President admitted that there is yet a much larger market for coke in the State of Montana, which is asking for supplies. It is well known that a great deal of steam coal is furnished to the Great Northern Railway, and the different towns which it serves, and that large supplies of coke go to the Great Falls smelters.

Comment on the price of the shares and the probable return that will be earned and distributed upon such price is not at present of general interest to our readers, but it certainly seems as though the usual dividend rate, which holders of coal mine shares are accustomed to receive, will not be exceeded by this Company, and that the price of the shares may fall, and this for many reasons, not the least of which is the supplying of the local provincial demand by the Canadian Pacific Railway from the mines which that large corporation owns.

The Toronto Meeting of the Mining Institute.

The Toronto meeting of the Canadian Mining Institute must be pronounced to have been a very successful affair, notwithstanding the shock and gloom occasioned by the sad death of its deeply lamented Secretary, and in spite of the curtailment of the programme occasioned by the abandonment of the banquet on Friday evening, and of the excursion to the power plants at Niagara. The number and character of the papers presented does not fall below those of any other meeting and the attendance was both large and representative.

Discussion is the life of all such gatherings, and there was plenty of it at this meeting. The paper of President Coste, which

dealt with the character of the existing Dominion Regulations and Provincial Mining Acts, was an able statement of many reasons why such Statutes work an injury to the mining industry, not only by their evasions, loopholes, and lack of regularity, but also by their omissions. It is to be regretted that this paper was put down for the concluding session of the meeting, as it provoked more discussion than any other paper read. As it was, discussion had to be restricted during the closing hours, but the REVIEW hopes that written discussion will be continued.

Other notable features of the meeting were the increased time given to Students' Papers, some of which were very able, and the fact that this was the first time the annual meeting had been held elsewhere than in Montreal. The success of the Toronto meeting leads to the hope that the Council will repeat the innovation whenever circumstances warrant it.

CORRESPONDENCE.

The Mountain Lion Mine, U. S. A.

TO THE EDITOR.

SIR:—

As many of the larger shareholders of this Company live in Montreal, Toronto and Ottawa, an account of the operations of the Mountain Lion Gold Mine may be of interest.

This mine is owned by the Mountain Lion Gold Mining Company, Limited, with Mr. A. E. Palmer, formerly of Buckingham, Que., as President, and comprises 6 patented claims in the Republic Mining Camp, State of Washington, in close proximity to the Boundary.

There are three quartz veins on this property, the most important one and the one which carries the highest values, having a width on the surface of 26 feet. This vein has been developed by a system of shafts, drifts and tunnels. The present crosscut tunnel taps this vein at a depth of 275 feet from the surface and has a total length of 1,300 feet, the vein being cut at 800 feet from the mouth of the tunnel in a width of 18 feet. From this point a shaft was sunk to a depth of 350 feet, giving a total depth of 625 feet. Below this point it is reported sinking is in progress, and before long this mine will have an explored depth of approximately 1,000 feet. The width of the vein as determined by a great amount of development work, varies between 8 feet and 20 feet, while the average values keep between 11 and 13 dollars per ton. There are, however, shoots of ore, which assay 35 dollars and occasionally 72 dollars per ton; such a rich ore shoot was crosscut by the main tunnel and formed a part of the main ore lode. It is remarkable, that in the Republic Camp the ore values towards the depth are higher than on the surface. This feature has been observed in the Mountain Lion, in the Republic Mine and in several other properties. The main vein of the Mountain Lion carried no value on the surface; at a depth of 20 feet the values increased to 4 dollars per ton, and at 50 feet the average value across 12½ feet of ore was \$11.50 per ton; at a depth of 275 feet a rich ore shoot was encountered, showing values of over 70 dollars per ton over the full width. The mine since the beginning of actual operations has had to undergo a great many difficulties, especially as regards the rational and successful treatment of its ore. When the Republic Mine had its mill in operation from 1898-1899, it was found, that the Amalgamating-Cyaniding process as worked out by Pelatin-Clerici was not a success on account of the heavy losses in gold. The percentage of saving was only from 55-75, and the cost of treatment 8 dollars per

ton. Experiments were then carried on, both with Republic and Mountain Lion ore, on a large scale and several cyaniding experts came to the conclusion that the Republic ore could be treated successfully by the combined stamp-mill-amalgamating process with subsequent pulverizing and cyaniding. The Gold and Silver Extraction Company of America then undertook the responsibility for the treatment of the Mountain Lion ore at a royalty of 10 cents per ton, at the same time guaranteeing an extraction of at least 85 p.c. of the gold and 60 p.c. of the silver values. A mill for the employment of this process was constructed in 1899 at a cost of about \$45,000 and was started for actual treatment of the ore on the 16th of March, 1900, but the results obtained were far from being satisfactory. From May to October of the same year altogether 11,960 tons were treated, the average saving being only 54.9 p.c. of all the values at a cost of \$3.73 per ton. In consequence of these disappointing results the mill was closed on November 1, 1900. Further metallurgical tests were made with the ore and though the results showed some encouragement as to the probable improvement in the extraction, should further modifications of the plant and process be made, still, after the experience already gone through and the failure of previous metallurgical experts to verify their predictions, it was not deemed advisable to incur any expenditure for further mill modification, especially in view of the fact that at that time it was within the bounds of certainty that a railroad would soon be constructed to the town of Republic. This would give an opportunity of selling the ore to the smelters located on the line, which were desirous of obtaining a certain quantity of silicious ore hitherto procurable only in a limited measure. When this railroad, (the Kettle Falls R. R.), was completed, arrangements were at once made to make contracts for the delivery of ore with the smelters, and to resume operations at the mine. Since the beginning of August, 1903, ore has been shipped from the Mountain Lion Mine at the rate of 120-150 tons per day, to the different smelters in the Boundary country, the Hall Mines and the Granby Smelter, but it was questionable whether, even with freight and treatment charges as low as \$6.50 per ton, a reasonable profit could be made. Again, it was found, that the market for the Republic ore was not so large as anticipated, as the self fluxing character of the Boundary ores does not allow of any large additions of pure silica. In October last year tests with the ore were resumed, this time with an entirely new process, invented by Dr. Hendryx, of Los Angeles, Cal., and from the results already obtained, it appears that this process has a fair chance of success. It is claimed that it recovers more than 90 p.c. of the gold and from 60 to 80 p.c. of the silver, with an average recovery of 86 p.c. of the total values; it is also claimed that the cost of treatment would not exceed \$1.50 per ton. Since the beginning of December, 1903, the old mill of the Mountain Lion Mine has been altered to the Hendryx process, and a fifty ton agitator added; the total cost of all these alterations has been in the neighbourhood of \$5,000. The stamps of the old mill began crushing ore on the 3rd of February for a thorough trial by this process, and it is reported that the first clean up was very satisfactory. Since then several changes in the mill were made and several lots of ore treated, but up to the beginning of March no data as to the treatment were received. If the Hendryx process, employed on a large scale, will give the results which have been claimed for it, it is evident that a new and prosperous era will follow after years of stagnation and disappointment; the Mountain Lion Mine has very large ore reserves; it was never a question of value or quantity of ore—it was the treatment of the ore which, up to this time, has laid so many obstacles in the way.

FRITZ CIRKEL.

Montreal, 10th March, 1904.

TO THE EDITOR.

SIR:—

I trust you can find space for enclosed appreciation of Mr. Bell.

THE LATE B. T. A. BELL.

(AN APPRECIATION.)

Ten years last November, I found myself for the first time in Canada, among strangers and in what looked a wild bleak place, for already three feet of snow covered the ground and to a green Englishman everything was strange and desolate. I soon discovered however, that there was something unique in the social qualities of Black Lake, Quebec (for that was the place), typified by the Asbestos Club, where for a fortnight I was entertained right royally and made to forget that I was far from home and its allurements. That friendly and hospitable coterie, long since scattered, can never be forgotten—L. A. Klein, Capt. Penhale, A. M. Evans, John Penhale, Cather, Murphy, and last, but not least, George Smith. To these came, three days before I left, B. T. A. Bell, with whom I struck up a firm friendship that strengthened as the years wore on and finally deepened into profound respect. Few men have seen as much of B. T. A., and none experienced more of the genuine kindness which was part of his big, generous heart. His personality attracted and charmed me from the first and in ten years I have known no one who could resist him. In his capacity of Secretary of the various Mining Societies and Institutes which he founded and fathered, he did many things which aroused antagonism. This was due largely to his wider experience, his deeper insight, and his forceful nature. He became restive if opposed and could ill brook the slow movement of less alert and incisive minds. In the end he always won out. I do not recall a single instance in which his judgment did not ultimately prove right.

His magnetism was so great that at times it carried opposition away as by a breath, indeed I have rarely met a man whose personality counted for so much. In Council, with Bell absent, there might be criticism and even the formation of a cabal to upset some of his schemes, with Bell present they fell like cardboard houses before his impassioned and convincing attack.

What the Canadian mining interests lose can never be told. His services in fostering mining societies and, finally, building up a Canadian Institute, were colossal, and completely successful, and his departure leaves one of the best and most firmly established Institutes in the mining world, especially noted for its admirable re-unions every year, when our late friend was the life and soul of the whole movement. Of his services to mining literature, it is impossible to speak too highly. His annual reports on mineral production were most valuable and highly appreciated. In the pages of the MINING REVIEW he attacked every wild scheme and dishonest promotion that came under his notice—its pages were open to exposure of everything that would tend to weaken the industry he loved so well and did so much to serve. It mattered not how big the corporation, or how wealthy the syndicate, if there was a cloven hoof he would expose it. So generous was he that more than once he incurred serious responsibility rather than "back down" or betray his correspondents; and so keen was his judgment in such matters that, through nearly twenty years of caustic criticism, he never had to withdraw a statement. Absolutely fearless and just, he was the terror of mining frauds, and in this sphere Canada will lose much by his demise.

At forty he had attained a position where his worth was recognized and his recent appointment on the Yukon Commission was only an earnest of higher service for the country of his adoption. We shall go on a little longer, and with another to lead us, but it will not be a Bell. In his absence we shall muse on the undaunted spirit that so often cheered and stimulated us—that never failed a friend and never quailed before a foe. None more truly exemplified the spirit of Henley's virile stanza:

"It matters not how straight the Gate
How fraught with punishments the Scroll,
I am the Master of my fate,
I am the Captain of my Soul."

Nelson, B. C., March 18th, 1904.

WM. BLAKEMORE.



BENJAMIN TAYLOR A. BELL

Born 2nd July, 1861. Died 1st March, 1904.



SIXTH ANNUAL MEETING
OF THE
CANADIAN MINING INSTITUTE

HELD AT

Toronto, Ont., March 2nd, 3rd and 4th, 1904.

The annual meeting of the Canadian Mining Institute was called for the 2nd, 3rd and 4th days of March, and a Council meeting for the evening of the 1st of March. The Council meeting lacked a quorum, and in view of the sad death of the Secretary, additional members were invited to be present in order to transact the necessary business, such business afterwards to be reported to a quorum of the Council for approval.

The President announced that news of the death of the Secretary, which occurred that morning at ten minutes past ten, had been communicated to the Institute in a telegram from Mr. Hardman, and that the President and Treasurer on receipt of the news had telegraphed and written letters of condolence to Mrs. Bell.

Messrs. Coste, Brown and Leckie were appointed as a delegation to represent the Institute at the funeral in Ottawa on Thursday afternoon.

By resolutions it was voted, to abandon both the Banquet on Friday night and the excursion to Niagara Falls on Saturday; also to adjourn the Thursday afternoon meeting during the funeral of the late Secretary.

Other formal business was transacted and the Council adjourned.

The first session of the Sixth Annual General Meeting of the Canadian Mining Institute opened in the Banquet Hall of the King Edward Hotel, Toronto, on Wednesday morning the 2nd of March at 10 o'clock.

The following signed the register of attendance:—

Eugene Coste, Toronto.
W. G. Miller, Toronto.
S. Dillon-Mills, Toronto.
Elfric Drew Ingall, Ottawa.
R. W. Brock, Kingston.
Jno. McLeish, Ottawa.
J. Stevenson Brown, Treasurer, Montreal.
Frederick Hobart, New York.
J. Obalski, Inspector of Mines, Quebec.
Alfred E. Barlow, Ottawa.
James White, Ottawa.
B. A. C. Craig, Toronto.
J. M. Clark, K.C., Toronto.
J. A. Currie, Toronto.
Major W. Parsons, Toronto.

John Piche, Copper Cliff, Ont.
C. H. Heys, Toronto.
Jas. H. Bowman, London, Ont.
C. Garratt, Sudbury, Ont.
Dr. Robert Bell, Ottawa.
Robert G. Leckie, Sudbury.
J. A. Dresser, Montreal.
J. E. Hardman, Montreal.
E. J. Davis, Toronto.
Dr. J. Bonsall Porter, Montreal.
Jos. Errington, Massey, Ont.
R. C. Barclay, Massey, Ont.
G. E. Silvester, Sudbury, Ont.
J. L. R. Parsons, Toronto.
E. B. Biggar, Canadian Engineer, Toronto.
Thos. W. Gibson, Toronto.
A. P. Coleman, Toronto.
Wm. Thompson, Rossland, B.C.
Anthony Blum, Boston, Mass.
E. L. Fraleck, Belleville, Ont.
M. J. Hendrick, Belleville, Ont.
O. N. Scott, Listowel, Ont.
P. Kirkegaard, Deloro, Ont.
S. F. Kirkpatrick, Kingston, Ont.
A. F. Rising, Madoc, Ont.
H. H. Moore, Toronto.
T. L. Walker, Toronto.
J. J. Bell, Toronto.
A. Ferland, Haileybury.
M. B. Baker, Kingston.
Wm. Nicol, Kingston.
Frank D. Adams, Montreal.
F. T. Snyder, Chicago.
C. C. Richards, Montreal.
T. D. Ledyard, Toronto.
H. G. Deyell, Montreal.
A. Longwell, Foxboro, Ont.
J. C. Gwillim, Kingston.
John Hart, Hampstead.
B. O. Lott, Stirling.
John W. Cook, Marmora.

STUDENTS.

R. Anson Cartwright, Kingston.
Benj. Tett, Kingston.
P. McL. Forin.
R. O. Steachan, Kingston.
E. T. Corkill, Kingston.
C. G. Williams, London, Ont.
F. N. Rutherford, South Monaghan.
C. L. Coulson, Welland.
E. R. Jackson, Seaforth.
Robt. H. Bryce, Toronto.
A. J. Elder, Barrie.
P. A. Laing, Dundas.
W. M. Edwards, Iroquois.
P. C. Coates, Toronto.
J. F. Hamilton, Toronto.
T. H. Plunkett, Toronto.
J. Parke, Toronto.
H. C. Chilver, Walkerville.

C. A. Chilver, Walkerville.
 Chas. J. Ingles, Toronto.
 M. T. Culbert, Toronto.
 Henry Montgomery, Toronto
 J. Galbraith, Toronto.
 J. G. MacMillan, Toronto.
 J. H. Ryckman, Frontland.
 W. A. Begg, Toronto.
 C. W. Knight, Kingston.
 L. E. Drummond, Kingston.
 J. S. DeLury, Manilla, Ont.
 R. E. Hore, Toronto.
 G. C. Bateman, Kingston.
 T. W. Cavers, Kingston.
 K. A. MacKenzie, Toronto.
 Geo. W. Bissett, Kincardine.
 L. B. Reynolds, Montreal.
 E. J. Hassard, Toronto.
 Ralph E. DeLury, Toronto.
 Jas. G. Ross, Barrie.
 A. T. Stuart, Hamilton.
 H. A. G. Baker, Oshawa.

The meeting was called to order at half-past ten o'clock by the President, Mr. Eugene Coste, E.M. The minutes of the last annual meeting were read and approved.

The report of the Council for the past year having been printed and distributed, the President said :—

I may say gentlemen that the preparation of this report was the last work done by our late secretary. I received the report from him the morning he met with the fatal accident which caused his death, of which you were informed yesterday.

On the motion of Mr. J. Stevenson Brown, seconded by Professor Miller, the report was adopted.

TREASURER'S REPORT.

Mr. J. Stevenson Brown, Treasurer, presented the financial statement for the year, which was as follows :

TREASURER'S STATEMENT.

Year Ending February 1st, 1904.

<i>Receipts.</i>	
Balance from last year.....	\$1,682 49
Subscriptions, 284 at \$10.00.....	\$2,840 00
Student members, 9 at \$2.00.....	18 00
University members, 76 at \$1.00.....	76 00
Arrears collected.....	210 00
	3,144 00
Sale of Journals.....	40 25
Dominion Government Grant.....	3,000 00
Interest.....	13 05
	\$7,879 79
<i>Less.</i>	
Disbursements per statement.....	4,831 06
	\$3,048 73
Balance on hand....	\$3,048 73

Audited and found correct,

GEO. McDougall,
 H. W. DeCourtenay,

SUMMARY STATEMENT

Showing distribution of Disbursements to the various Work and Business of the Institute.

<i>Publications :</i>			
Cuts, Line drawings, Half tones, etc...\$	387 99		
Copying, Proof reading and Charges re			
Vol. VI	1,300 00		
Printing, etc	153 19		
Postage, Express, and other charges....	122 26	1,963 44	
<i>Library :</i>			
Rent	271 66		
Care of Library.....	40 00		
New Books.....	76 00		
Binding	32 00		
Furniture and Signs.....	187 25		
Removing to Ottawa.....	62 37		
Insurance.....	17 00	686 28	
<i>Meetings :</i>			
Reporting Annual Meeting.....	100 00		
Typewriting, Copying, Annual Dinner			
and Sundry disbursements	278 90		
Council Meetings.....	135 00		
Deputations.....	255 10		
Advertising.....	50 00	819 00	
<i>Secretary's Office :</i>			
Annual Grant.....	500 00		
Postage and Telegrams.....	61 12		
Stationery and Typewriting Supplies....	77 38	638 50	
<i>Treasurer's Office :</i>			
Annual Grant.....	500 00		
Bank charges on Cheques and Drafts... ..	62 35		
Postage and Telegrams.....	40 00		
Stationery and Sundries	36 49		
Audit	10 00	648 84	
<i>Prizes :</i>			
L. P. Silver... ..	25 00		
H. P. DePencier... ..	25 00		
N. W. Parlee.....	25 00	75 00	
			\$4,831 06

J. STEVENSON BROWN,
 Treasurer.

MONTREAL, February 1st, 1904.

Mr. J. STEVENSON BROWN—I may point out that this statement shows that about \$130 were received more than is stated in the report of the Council. That is due to the fact that between the 1st, of February and the present date a number of members have paid their subscriptions. I would also like to point out that the balance appearing there, amounting to over \$3,000, is larger than it should be when all the accounts are paid. Owing to the unfortunate fire which took place at Ottawa, the Sixth Volume of the Journal of the Mining Institute, which was about ready to be issued, was destroyed. It will entail extra expense to have the volume re-issued. There are about eight hundred dollars involved in that, and the payment of that amount will only be made this year, so that the balance should be about two thousand two hundred dollars. I should like also to explain that in former years

the Secretary was given a fixed sum which was intended purely for the running of the office, and it was customary for him to employ extra help as he required it in connection with the pressing work of the Institute, and particularly the issuing of the volume of our Transactions. However, last year instead of giving the Secretary an allowance as formerly, we gave him a fixed sum of fifteen hundred dollars to cover all the expense of the office, and the extra help required. Of this amount, five hundred dollars is charged to the Secretary's office and a thousand dollars was put down to the cost of publication.

On the motion of Mr. Obalski seconded by Mr. Mills, the report of the Treasurer was adopted.

NEW MEMBERS.

The following new members were elected :—

- A. Harry Hook, Chemist, 9 Suffolk Place, Toronto, Ont.
- H. B. Wright, Chief Engineer Crow's Nest Pass Coal Co., Fernie, B.C.
- Henry L. Manley, Mining Engineer, Crow's Nest Pass Coal Co., Fernie, B.C.
- Milton T. Culbert, Geologist, 226 McCaul St., Toronto, Ont.
- Herbert C. Philpott, 220 Brunswick Avenue, Toronto, Ont.
- S. L. Spafford, Capelton, Que.
- Robert McKay, Barrister, Messrs. McKay, Dods & Grant, Toronto, Ont.
- H. S. Burrell, Belleville, Ont.
- J. L. R. Parsons, Geologist, 12 Lowther Avenue, Toronto, Ont.
- Anthony Blum, Mine Owner and Mine Operator, 35 Court Street, Boston, Mass.
- Elfric Drew Ingall, Mining Engineer, Geological Survey, Ottawa, Ont.
- A. P. Coleman, Professor of Geology, School of Practical Science, Toronto, Ont.
- J. W. Tyrrell, Civil & Mining Engineer, Hamilton, Ont.
- Chas. H. Heys, Consulting Chemist, 114 Bay St., Toronto, Ont.
- Chas. B. Jackes, Barrister, Toronto, Ont.
- Henry Montgomery, M.A., Ph. D., Professor, Trinity College, Toronto, Ont.
- Arthur Ferland, Mine Owner, Haileybury, Ont.

AFFILIATED MEMBERS.

SCHOOL OF PRACTICAL SCIENCE.

The following members of the Engineering Society of the School of Practical Science were affiliated as Student Members of the Canadian Mining Institute :—

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|--------------------------------|--------------------------------|
| Acton, C. S., Toronto. | Pullen, E. F., Oakville. |
| Banting, E. W., Toronto. | Thomson, H. P., Toronto. |
| Bates, M., Chatham. | Chilver, C. A., Walkerville. |
| Bissett, G. W., Toronto. | Chilver, H. L., Walkerville. |
| Galt, G., Rossland, B.C. | Coates, P. C., Victoria, B.C. |
| Hassard, E. J., Mono Mills. | Elder, A. J., Barrie. |
| Huber, W., Bracebridge. | Fleck, J. G., Ottawa. |
| Johnson, H. A., Hamilton. | Ingles, C. J., Toronto. |
| MacKenzie, K. A., Toronto. | Jackson, E. R., Seaforth. |
| Murphy, C. J., St. Catherines. | Laing, P. A., Dundas. |
| Purser, R. C., Windsor. | Parke, J., Oil City. |
| Rolfson, O., Walkerville. | Rutherford, F. N., S. Monaghan |
| Ryckman, J. H., Hamilton. | Bryce, R. A., Toronto. |
| Stirrett, G. P., Petrolia. | Coulson, C. L., Welland. |

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|-----------------------------|---------------------------|
| Begg, W. A., West Flamboro. | Edwards, W. M., Iroquois. |
| Broadfoot, F. C., Seaforth. | Hamilton, J. F., Dunedin. |
| Campbell, W. C., Keene. | Plunkett, T. H., Meaford. |
| McKenzie, D. W., Lochalsh. | Hill, S. M., St. Thomas. |
| Williams, C. G., London. | |

SCRUTINEERS APPOINTED.

On motion, Mr. Obalski, Mr. Frederick Hobart and Mr. S. Dillon-Mills were appointed Scrutineers of the Annual Vote.

AUDITORS RE-ELECTED.

On motion, Messrs. H. W. DeCourtenay and George McDougall were re-elected Auditors.

ANNOUNCEMENT BY TREASURER.

Mr. J. STEVENSON BROWN—I wish to explain that in regard to the lamented death yesterday of our late Secretary, we have this morning telephoned to Ottawa ordering a wreath for his coffin. The wreath will bear the initials of the Institute "C.M.I., 1904" and the design will be the two hammers crossed at the centre.

I wish to say a word with reference to the financial report of last year. No allowance has been made to the Secretary for the payment of help in regard to the re-publication of Volume VI. The sum of two hundred and fifty dollars is placed in these accounts, and I paid it on a telegram from, and under instructions of, the President.

On the motion of Mr. Craig the meeting approved of the appropriation of two hundred and fifty dollars to be applied to the re-publication of Volume VI.

As to the appointment of a successor to the late Mr. Bell, I do not think it is a question that we can very well deal with here, and so I shall make a suggestion which I hope will meet with the approval of this meeting. I have been in close contact with Mr. Bell for the last three or four years and, as there are probably few who knew better the value of the services he rendered to the Institute, I wish to speak in the highest terms of praise of the faithful manner in which he performed his duties, and of the interest which he took in the welfare of the Canadian Mining Institute. It is out of the question that we could appoint a successor at this meeting. The selection of a gentleman to take Mr. Bell's place requires careful consideration; I therefore beg to suggest that Mr. Coste, on whose judgment we can all rely, and Mr. John E. Hardman, in whom the members of the Institute have much confidence, should be appointed a committee to suggest to the Council a successor to our late Secretary.

The PRESIDENT suggested that Mr. Brown should also act on that committee.

Mr. CRAIG—It would appear to me that as the late Mr. Bell was re-nominated for Secretary, there will have to be an election to fill the vacancy.

The PRESIDENT—According to the By-Laws, six weeks notice must be given of the nomination of a gentleman to fill the office. That being the case, of course we could not elect a Secretary at this meeting. It seems to me that the best thing to do would be to vote on Mr. Bell's name this year as it is printed on the ballot paper, and then, that the Council shall appoint an acting Secretary pro tem. Then a new Secretary could be elected next year.

Mr. BROWN—I was under the impression that there was a clause in our By-Laws providing that in the event of the death or removal of one of our officers, the vacancy could be filled by the Council. That is done in a great many similar bodies, but there

is no provision for it in connection with our Institute. The Council could name an acting Secretary, and at the next annual meeting a Secretary would be elected. It is clear that we cannot elect a Secretary now and the arrangement suggested is apparently the only one that can be arrived at.

Mr. CLARK, K.C.—The By-Laws are very clear that the Secretary is to hold office until he is elected at the annual meeting. It is, I think, within the scope of this meeting to appoint a person to act temporarily until the office is filled in the regular way.

On the motion of Mr. Ingall it was decided that it should be left to the Council to select a Secretary to act for the time being.

The meeting adjourned at one o'clock.

WEDNESDAY AFTERNOON.

The members of the Institute met at half-past two o'clock. Mr. Coste, the President, in the Chair.

The PRESIDENT—Before proceeding with the business of the meetings, I am extremely sorry to have to refer to the irreparable loss we have sustained in the death of our Secretary, who for so long a time was the soul and life of all these meetings. For many years Mr. Bell has been identified with the mining interests of Canada, and he has rendered them valuable service. You know how well he was liked by every one with whom he came in contact, and how much we shall miss him in the future.

The President then read a letter from Col. Anderson, the President of the Canadian Society of Civil Engineers, expressing the sorrow of that Society at learning of Mr. Bell's death.

Mr. J. STEVENSON BROWN—I do not know that I can add anything to what Mr. Coste has already said as to the great loss which this Institute has sustained in the death of our late Secretary, Mr. Bell. He was beloved by us all for his sterling, manly qualities. He did what he believed to be best in the interest of this Institute, and, although he was a hard fighter, he had the respect and esteem of those who were sometimes opposed to his views. Mr. Bell expressed his views freely *in* the meetings and *out* of the meetings. He always acted in a generous spirit of fair play, and his conduct was always calculated to advance the interest of this Institute and of the mining industry in Canada. I have been very closely connected with Mr. Bell, during the last four years, in the office I have the honor to hold, and I can truly say that we will have to seek far and wide to find a man who will discharge the duties of the position of secretary so well as he did. I shall not dwell upon the subject, because my heart is too full of grief, but I will move the following resolution :

RESOLVED—That the Canadian Mining Institute, in Annual Convention assembled, records its profound regret and sorrow at the untimely death of its Secretary, Mr. B. T. A. Bell. That we testify to the great value of the work he has accomplished in the interest, not only of this Institute, but of the whole mining community, and to his untiring energy and zeal in furthering the objects of the Institute, whose welfare he had so much at heart. The officers and members desire to express to Mrs. Bell and family, their deep sympathy in their sad bereavement.

That a copy of this resolution be forwarded to Mrs. Bell.

Proposed by J. STEVENSON BROWN,

Seconded by W. G. MILLER.

Professor MILLER—Our President and Mr. Brown have so well expressed the feeling of the Institute at the great loss we have sustained, that it is unnecessary for me to do anything further than to second this resolution.

Mr. OBALSKI—As representing the mining community of

the Province of Quebec, I wish to bear testimony to the high character of our friend the late Mr. Bell. I have been connected with Mr. Bell for many years, and I know the interest he took in the mining business of Canada, and the valuable services which he rendered to this Institute. I express the sorrow and the deep regret of all the mining community of the Province of Quebec.

The resolution was unanimously adopted and it was resolved that it be forwarded to the family of the late Mr. Bell.

THE PRESIDENT'S ADDRESS.

The PRESIDENT, Mr. Eugene Coste, then presented his annual address. Mr. Coste, in rising to address the meeting, was greeted with warm applause. His address is printed in full in another column. On the motion of Professor Miller, seconded by Mr. Obalski, the thanks of the Institute were accorded to the President for his able address.

WEDNESDAY NIGHT SESSION.

Mr. COSTE having left, accompanied by Mr. J. Stevenson Brown, to attend the funeral of the late Mr. Bell at Ottawa, the chair was taken by Professor Miller.

Mr. R. W. BROCK of Kingston, Ontario read a most interesting paper on "Poplar Creek and other New Goldfields of the Lardeau District, B.C." The paper was illustrated by lantern views and led to an interesting discussion.

The paper by Mr. W. E. H. Carter, M.E., Toronto, On the "Mines of Ontario" was read by Dr. Barlow and was also illustrated by lantern slides.

The CHAIRMAN regretted that a number of gentlemen of the Sudbury District were not present, owing to the snow blockade on the railways. Had they been able to attend he was sure they would have contributed valuable information to the discussion.

Dr. W. A. PARKS of Toronto read his paper on the "Study of Stratigraphy."

Mr. S. DILLON-MILLS, Toronto, read an interesting paper on "Recent Rock Movements in the Laurentian."

The CHAIRMAN announced that the reading of students' papers would take up the session on to-morrow, Thursday, morning. He said: "Our late Secretary who was a great friend of the students, frequently said that in the students' competition some of the very best papers had been presented that had ever been printed among the publications of the Institute."

THURSDAY MORNING SESSION.

The members of the Institute met on Thursday morning at half past nine o'clock, when the reading of papers by students was proceeded with.

Mr. J. F. HAMILTON of the School of Practical Science, Toronto, read a carefully prepared paper on "The Relative Attraction of Different Minerals For Residuum Oil."

On the invitation of the Chairman, Professor Miller, Mr. Hamilton illustrated on the blackboard the different attractions for oil. The paper was discussed by Prof. Miller, Prof. Mickle, Dr. Walker, Dr. Porter and Dr. Adams.

Mr. T. H. PLUNKETT of the School of Practical Science, Toronto, read a paper on the "Rate of Solution of Gold in Potassium Cyanide." The paper was discussed by Mr. Thompson, of B.C., Dr. Porter, of Montreal, and by the Chairman.

Mr. T. W. CAVERS, School of Mining, Kingston, read a paper on "The Treatment of the Dry Ores of the Slocan District." Mr. Cavers illustrated on the blackboard the results of the tests giving the extraction by the different methods.

The paper was discussed by Prof. Mickle, Prof. Kirkpatrick, Dr. Porter and Mr. Gwillim.

Mr. C. W. KNIGHT, of the School of Mining, Kingston, read an interesting paper on "Notes on some Deposits in the Eastern Ontario Goldfield."

The paper was discussed by the Chairman (Prof. Miller), Prof. Mickle, Mr. S. Dillon-Mills, Mr. Baker and others.

There was no session of the Institute on Thursday afternoon, out of respect to the memory of the late Mr. Bell, whose funeral was taking place in Ottawa.

On Thursday night the members of the Institute re-assembled, Prof. Miller in the Chair.

Mr. J. OBALSKI, Inspector of Mines for Quebec, in a paper on minerals containing radium in that Province, pointed out that so far uranium ores are the only ores in which radium has been found. In the Laurentian formations the uraninite, composed of oxide of uranium and other rare metals, had been met with in pegmatite dykes, which have been operated as producers of white mica, and we had only the record in the Villeneuve mine in Ottawa County, with manazite and uraninite, and the Maisonneuve mine in the County of Berthier, with samarskite, although there are several other white mica mines and prospects in the Saguenay district. About ten years ago he had found, in a white mica mine operated by the Canadian Mica Company, a remarkable specimen which he had identified as "cleveite" and exhibited to the Institute. This specimen has a specific gravity of 8.43, and weighs 375 grains, or about twelve ounces. It is well crystallized in dodecahedron form, deriving this from the isometric system. A complete analysis has not yet been made, but it contains 70.71 per cent. of oxide of uranium. He experimented with the specimen, and found it strongly affected photo plates, as shown by a number of radiographs which he displayed. It had also a well marked action on the electroscope. Prof. Rutherford of McGill, found that its radio-activity was equal to four or five times that of the crystal if it had been entirely compounded of uranium, and that it contained one-tenth of a milligram of radium, making it comparable with the best pitchblende so far worked for radium. This crystal may be an accidental one, although he found other small pieces of the same mineral in this vein. Mr. Obalski found also a material like coke, burning quite easily and having a large proportion of ashes, containing oxide of uranium. He was not able to state what was the relation between the two specimens, but he thought the fact important, and proposed to make a further investigation next summer. The white mica vein where these two specimens were obtained is near Lake Pied des Monts, about 18 miles back of Murray Bay in Charlevoix County, Quebec.

Dr. McLENNAN, of the University of Toronto, who has devoted much attention to the study of uranium, said that it was interesting to learn that such ores had been located in this country. He suggested that the exploring parties in different parts of the country next summer should be provided with testing apparatus, which could be made quite inexpensively, but of great sensitiveness. He mentioned the metals with which he had been working, and added that by passing air through crude petroleum he had obtained a highly radio-active gas. In reply to Prof. Miller, he said that so far the only economic use of radium was in medicine, though he was not very familiar with that subject. He, however, informed the Institute that Prof. Currie of Paris had been forbidden to obtain any more of the ore from Austria, as owing to the great value of radium, an embargo was put on the ore and he was unable now to produce good radium. The professor was now looking elsewhere,

and would be glad to get such ores from Ontario or Quebec. Dr. McLennan suggested that the Government should give a bounty for the discovery of the ore.

Mr. E. L. FRALECK, of Belleville, said that white mica had also been found north of Cloyne, in Frontenac County; at Oak Lake, Peterboro County, and in Sheffield Township, near Tweed; all in eastern Ontario, in addition to the places mentioned in Quebec by Mr. Obalski.

Professor MILLER said that even more remarkable than the "cleveite" was the specimen of coal. When the discovery of coal was announced in Northern Ontario some papers ridiculed geologists for having declared it was impossible to find coal in such formations. If the coal there was not of the usual quality for consumption it might contain qualities which would make it valuable for other purposes. The white mica deposits in eastern Ontario would be explored this summer by an electric company, which hitherto had been obliged to import from India.

Hon. E. J. DAVIS, Commissioner of Crown Lands, at the invitation of the President, briefly addressed the meeting. Mr. Davis was warmly applauded on rising, and said: He recalled that after assuming office he had attended a meeting at Sudbury to get the benefit of practical advice. The discussion had been frank. (Laughter). He had asked for it and his wishes had been complied with. (Laughter). In accordance with a unanimous desire he had abolished royalties, and again after the Act was changed he had, in accordance with their request, left it alone. He hoped to be present to hear the paper by President Coste on "Suggested Improvements in the Mining Laws of Canada," because he desired to have the knowledge of practical men in making legislation and in administering the laws. Having welcomed those from the other provinces, he referred to the good work done by Prof. Miller, Dr. Coleman, Mr. Archibald Blue, and Mr. T. W. Gibson, the present Director of Mines.

Professor COLEMAN read a paper prepared by Mr. A. B. Willmott, which pointed out that for the past few years, there has been considerable discussion on Ontario iron ores. The geological similarity between certain belts in Ontario and those south of Lake Superior had been recognized. It has been claimed, especially in old reports, that Ontario and Quebec abounded in ore, of the first quality. The politicians said so. Yet the Hamilton, Soo and Midland furnaces have only one large producer on which to draw to-day. In 1902, these furnaces consumed 93,000 tons of Ontario ore and 94,000 tons of foreign. Still he thought that the politicians would prove right, and that the lack of ore bodies is because they were not sought in the right way. The paper proceeds to describe surface indications on iron ranges running from the Lake of the Woods to the Ottawa River, and suggested methods to be followed in making systematic exploration. Such work on the Steep Rock, Animikie, Michipicoten and Hutton ranges has resulted in the discovery of ore bodies, but the amount of work done in Ontario on all the ranges put together is trifling compared with that done on the Vermillion range alone, south of Lake Superior between Tower and Ely, a distance of only twenty miles. The time has gone by for running through the woods with a canoe and pick. Iron ranges in large numbers have been found. The question is, what is in the bottom of them?

One of the most interesting of the papers read at the meeting was that presented by Mr. F. T. Snyder, of Chicago, on "Magnetic Separation." This paper was discussed by Mr. Craig, Mr. Obalski, Dr. Potter, Dr. Barlow, Mr. Baker and Mr. Thompson. The Meeting adjourned at 11 o'clock until Friday morning.

FRIDAY MORNING SESSION.

The members of the Institute assembled at half past ten o'clock Friday morning. The meeting was presided over by the President, Mr. Coste, who had returned from Ottawa, accompanied by Mr. J. E. Hardman, Major Leckie, and Mr. Stevenson Brown.

The morning session of the Institute was devoted to the reading of papers by students.

Mr. E. T. CORKILL, School of Mining, Kingston, read his paper on "The Occurrences, Production and Uses of Mica."

The paper of Mr. H. Forbes, McGill University, on "Chlorination at North Brookfield, N.S.," was read by Dr. Porter.

The paper by Mr. Atkinson, McGill University on "Notes on Mining in the Regent Group of Mines, Negaunee, Michigan," was read by Mr. Deyell.

The paper by Mr. E. J. Carlyle, of McGill University, on "Pioneer Iron Mine, Ely, Minnesota," was also read by Dr. Porter.

FRIDAY AFTERNOON SESSION.

The meeting opened at 3 p.m. The President announced that the funeral of the late Secretary, Mr. Bell, had been very largely attended in Ottawa, showing the esteem in which he was held by the community. The Rev. Dr. Barclay of Montreal conducted a most impressive service, and the Quebec Mining Association was represented by Mr. Archibald W. Stevenson.

The paper by Mr. A. C. Garde, on "Notes on the Zinc Problem in British Columbia," was read by Professor Gwillim.

Professor MILLER, Provincial Geologist, Ontario, read his paper on the "Undeveloped Mineral Resources of Ontario." He said in the course of his address that in ten years the product of Ontario had doubled in value. Glacial action had carried the richest soil from Ontario to tracts south of the boundary line, but this was compensated for by the ore bearing rocks thus exposed for the miner.

The old text books taught that it was only in the Huronian rocks that minerals could be found, and that the Laurentians must be considered of little economic value. Prospectors have disproved all that, for, in the Laurentian granites have been found mica, muscovite, corundum and a number of other rare minerals. This gave hope for a mineral development in Ontario far in advance of anything hitherto believed possible. It was now recognized that the Laurentian series of rocks was as rich, or richer, than the Huronian strata in mineral deposits, and the Laurentian granite areas were assuming great economic importance. Stock jobbing had greatly injured the development of Ontario's mining resources. Professor Miller instanced a case in which the most promising gold deposit in Ontario, discovered by Mr. Coste, 21 years ago, was still lying idle because the owners thought they could develop it at someone's else expense. Differences among the shareholders have kept the only platinum mine in the province lying dormant since its discovery 15 years ago. The only iron mine working was due to its favorable location. Iron, nickel and cobalt, distinguished by their magnetic qualities, found together in such quantities, suggested that their concentration was due to magnetic influences or to the antiquity of the rocks of this region. Ontario had only one rival in nickel, and if present promise was fulfilled, she would control the cobalt market, in which no other country could compete.

Prof. Miller referred to the grinding and polishing minerals, graphite, corundum and to the presence of opaque sapphire, ruby and beryl. Prof. Hobbes, of Chicago, had found diamonds in the glacial drift south of the boundary, and there was good reason to

believe that diamonds will be found in northern Ontario. If the sulphur could be collected which is wasted in the smelting of 1,200 tons of nickel, it would be worth \$3,000 a day. Oil and gas are likely to be discovered in the north, the geological conditions there being the same as in the districts already exploited, but on a much larger scale.

Dr. McLENNAN, of the University of Toronto, displayed a small quantity of radium and showed the Institute its marvellous properties. With the specimen crystal picked up by Mr. Obalski, north of Murray Bay, he discharged an electroscope, showing that it possessed the radio-activity. He then exhibited a small and inexpensive electroscope, which he had constructed, and which could easily be carried by a prospector. Dr. McLennan received the hearty thanks of the Institute.

FRIDAY EVENING SESSION.

MR. COSTE, the President, in the chair.

RESULTS OF ELECTION.

The Scrutineers reported the result of the Annual Ballot as follows:—

"The Scrutineers appointed to open the ballot box and count the votes cast for officers of the Institute beg to report that:

Three ballots, which were unsigned, were rejected; the remaining ballots were all for the names presented by the Nominating Committee. The Scrutineers therefore report, the officers elected for the year 1904-1905 were:—

President, Mr. Eugene Coste, E. M., Toronto.

Vice-President, Mr. E. B. Kirby, M. E., Rossland, B.C.

Treasurer, Mr. J. Stevenson Brown, Montreal.

Secretary, the late Mr. B. T. A. Bell, Ottawa.

Council Members:—

James McEvoy, Fernie, B.C.

W. F. Robertson, Victoria, B.C.

A. B. W. Hodges, Granby, B.C.

W. G. Miller, Toronto, Ont.

R. G. Leckie, Sudbury, Ont.

John Blue, Eustis, Que.

Frank D. Adams, Montreal, Que.

Graham Fraser, North Sydney, C.B.

Respectfully submitted,

Frederick Hobart, }
J. Obalski, } Scrutineers.
S. Dillon-Mills, }

Professor T. L. WALKER, of Toronto, in a paper upon "The Geological Survey as an Educational Institution," urged that there should be more co-operation with high schools and colleges in the practical training of geologists. A discussion followed, after which on the motion of Mr. Craig, seconded by Mr. Clark, K.C., it was RESOLVED:—

"That the President, Major Leckie, J. Stevenson Brown, Dr. F. Adams, Prof. R. W. Brock, T. L. Walker and B. A. C. Craig, be a committee to confer with the Minister of the Interior, and the heads of the Provincial Mining Bureaus, on the necessity of giving preference to geological students when making up geological survey parties; and that the committee also point out the necessity that the Minister of the Interior and the Provincial Governments should take steps to maintain the efficiency and increase the size of the permanent Geological staff."

Mr. COSTE then vacated the Chair in favor of Mr. J. Steven-

son Brown, in order to read his paper on "Suggested Improvements in the Mining Laws of Canada."

Mr. COSTE reviewed the laws in force in the various provinces and objected to the position of the Dominion, which governed by regulations emanating from Orders in Council, a more permanent method was desirable. The *results* of the present laws were their greatest condemnation. Out of 400,000 acres granted in Ontario under patent since 1897, only 4,000 acres were being worked. At least another 400,000 acres had been granted previously to 1897, so that only one half of one per cent. of the land granted for mining purposes was being developed. There remained in Ontario only a million acres of mineral lands, and at the present rate these would be exhausted in 15 years. To rely on the self interest of the owners for the development of the lands had been shown by experience to be useless. The chances were 2,000 to 1 against development of lands whose value was unknown, but amongst which were almost all the good mines.

His remedy had been accepted, in principle, by all the provinces and consisted of imposing an assessment *in work*, of about \$5 per acre, from holders of mining lands; failure to comply with this condition forfeited the lands to the Crown, unless an equivalent amount in cash be paid within one month of the end of the year. In the Yukon, \$200 an acre was the requirement. In Nova Scotia 40 days labor per area (four-fifths of an acre) was required, equal to \$200 per year. Mr. Coste thought a \$5 assessment would be one of the greatest boons to the bona fide mining community since it would tend to eliminate the drones and stimulate the exertions of the busy bees.

Mr. COSTE'S proposals were supported by Major Leckie and others, and strenuously opposed by Mr. Gibson and others, resulting in a very animated discussion, which did not terminate until near midnight, when the meeting for 1904 was concluded.

CANADIAN MINING INSTITUTE

Annual Meeting, 1904—Presidential Address.

GENTLEMEN :

It becomes my pleasant duty, as President of the Canadian Mining Institute, to welcome you all to this our 6th annual meeting, and, personally, permit me to greet you all the more heartily as this is the first meeting of this Institute to take place in my native Province of Ontario. In past years we have held our annual meetings in the good old City of Montreal, which, by the special Act of Parliament incorporating our Institute, is designated as the place for our head office. Royal times did we have there and good lively discussions on many very interesting topics concerning our mining industries. But we propose here in Toronto to lag behind, neither in contentment and good fellowship among ourselves, nor in the sharp interest always shown in the papers presented by our members. The only fear we have is that our discussions on matters affecting our mining industries will not be as lively here, outside of the French-Canadian invigorating atmosphere. This would be a pity, but it, however, remains to be seen whether it will be so, and we can tell better after the meeting whether our fears in this respect were correct, or whether mining men, especially Canadians, are not always lively wherever they may be.

When this Institute was founded in 1898, it numbered sixty-six members from Quebec, and forty-four from Ontario, exclusive of student members, whilst at the end of last year our record shows sixty-nine members from Quebec, and one hundred and

eight from Ontario, exclusive of student members. To this much quicker and larger growth of membership in Ontario, is to be attributed in a great measure the fact that we are gathering in Toronto to-day; and it is an indication that the mining centre of Canada is becoming fashionable and is preparing to move west and north, as further exemplified by the fact that we have now eleven members in the Yukon, while we had none there in 1898, and that we have now sixty-eight members in British Columbia, when we had only forty-two there in 1898. It is true, as an offset, that we have now from Nova Scotia thirty members instead of sixteen in 1898, but still it is clear that our Quebec and Maritime Province membership is (in point of number only) lagging behind the membership west of Montreal. No doubt this is only a natural result of the opening up of the western section of the country, but still I thought that by mentioning the fact I might nevertheless stimulate our eastern members to renewed efforts in getting all the good mining engineers and mining men in their provinces to join our Institute, in order to make it a still more powerful factor in carrying out the purposes, for which it was chartered by a special Act of the Parliament of Canada. These purposes are well defined in the preamble of our Charter, they are unselfish and noble purposes; and since this is our first meeting outside of Montreal, it seems a good opportunity to review briefly the past work of our Institute, as this review will show that we are living up to the patriotic, unselfish aims for which we got together some years ago, and are thereby greatly benefitting and promoting the development of the mining industries of Canada.

A little of the past history of the several mining organizations which preceded us is here necessary, since we are the successors of these bodies of mining men formerly organized separately in the different mining provinces, but which afterwards not only formed a federation, but even dissolved themselves subsequently into a larger and stronger Institute under a general Charter from the Canadian Parliament to embrace mining engineers and mining men from the whole of the Dominion of Canada.

The following is a brief sketch of the evolution of these mining associations :—

January 23rd, 1891—General Mining Association, Province of Quebec, was formed.

March 30th, 1892—Mining Society of Nova Scotia was formed.

April 10th, 1894—Ontario Mining Institute was formed.

January, 1896—Federated Canadian Mining Institute was formed.

March 4th, 1898—Canadian Mining Institute was formed.

Before the organization of the Quebec Mining Association there was a small organization in Nova Scotia called The Gold-Miners Association of Nova Scotia, of which our present worthy secretary was the only honorary member. We must not overlook the Mica Miners Association, which did some good work in collecting a large amount of data concerning the production, uses and markets for mica, nor the organization effected last year of the Provincial Mining Association of British Columbia, a very well organized body of all classes of the community in that Province, organized for protection, and the betterment of mining legislation in British Columbia.

All these organizations have been a powerful factor for good. First through their publications :—

A list of the papers read before these bodies forms quite an imposing and exceedingly creditable contribution to our mining literature; they, and the discussions upon them have been published in pamphlets and handsome volumes, and have rendered an impor-

tant service to the country in advertising our mineral resources and industries. This list of papers is printed in a separate pamphlet, already before you. A glance at it will illustrate the great diversity of the subjects treated, that is almost to say the great richness of Canada's various mining resources; and a careful reading of the papers will convince one of the great value of this literature to the country.

I will only add here that, if a comparison is made between the publications of the Canadian Mining Institute, as shown at the end of the appended list, and the publications of "The Institution of Mining Engineers" of England, or of "The American Institute of Mining Engineers", it will be found that, relatively per capita of members, our papers are considerably more numerous and, as to their worth, we are of course too modest to speak, and leave it to others but with confidence in the verdict.

Thus we see that the first object and purpose of this Institute as set down in our charter, viz:—"To promote the arts and sciences connected with the economical production of valuable minerals and metals, by means of meetings for the reading and discussion of technical papers and the subsequent distribution of such information as may be gained, through the medium of publications", is very creditably carried out by the Institute. But if, in the short space of time of six years since the incorporation of the Institute, we have made such an excellent showing in the matter of publications, it is still more pleasing for me to record that these publications are improving very rapidly from year to year and that the last two volumes of our Journal, volumes V and VI, contain many more papers of a still higher and useful class than the preceding volumes, and that they are well and profusely illustrated.

I take renewed pleasure here in again recording and acknowledging with thanks, as President of the Institute, the generous assistance of the Dominion Government in granting us three thousand dollars per year during the last two years towards defraying the expenses of these publications and of the Institute in general. Thus the Government has recognized our Institute as of public utility, and has facilitated its growth and influence. In doing so, it has no doubt rendered a great public service to the country, as the mining engineers and mining men of Canada together in a chartered strong organization can do so much to make known, develop, utilize and protect its great mineral wealth, and the Canadian Mining Institute composed of such men has shown and will continue to prove, that it can be of the greatest service in these most important undertakings.

But not only by the publication of technical papers read at its meetings can an Institute such as ours be of service to the country, but the Canadian Mining Institute as a body has still another very important mission to perform, and that is also defined in its Charter as one of the purposes for which it was founded, thus, namely:—"to take concerted action upon such matters as affect the mining and metallurgical industries of the Dominion of Canada."

This mission is all the more important that we are practically alone entrusted with it in Canada, since with the exception of the Mining Society of Nova Scotia and of the Provincial Mining Association of British Columbia, we are the only organized and incorporated body of mining engineers and mining men in the country, and of course the above Provincial Associations only represent their provinces in matters purely local, while the Canadian Mining Institute alone represents the mining interests of the entire Dominion of Canada, not excepting Nova Scotia or British Columbia, as almost every member of the above mentioned Provincial Associations is also a member of our Institute.

In the matter of the publication of technical papers we are

sharing the duty and responsibility with other societies and with such Government institutions as the Geological Survey and the Provincial Mining Bureaus, but in all matters affecting the welfare of the material interests so dear to us of the mining and metallurgical industries, we repeat, this Institution is, in a very large measure, alone to raise a competent voice and to give authoritative advice.

This protective mission or duty which, naturally and by its Charter, devolves upon this Institute, was in fact the reason for its foundation, as the first movement to form what is now the Canadian Mining Institute was prompted by the introduction of the Mercier Mining Act in Quebec to oppose which the Quebec Mining Association, our first parent, was organized early in 1891.

In looking over the report of one of the first meetings, held in this connection at the St. Lawrence Hall, Montreal, in October, 1890, we notice these significant remarks from one I need not introduce.

The then Hon., now Sir, Wilfrid Laurier having been called upon by the Chairman said:—"He had just dropped in to listen, and had no intention of making a speech. He was personally interested in mining operations in the Province, and although he would not go so far as to say that after mines had reached a certain stage of development they should not be made to yield some public revenue, still he felt that to impose any new burden upon what was yet a new industry would not only be detrimental but fatal (Cheers). He deprecated the introduction of politics into the matter. He need not tell them that he was a supporter of Mr. Mercier (Laughter and Applause), but he was nevertheless ready to join those present in demanding that an industry in which he was to some extent interested should be safeguarded. He fully believed that when the bearings of the subject were placed fairly and justly before the Government they would shrink from the adoption of legislation injurious to the interest of the Province."

In the above language of our distinguished Premier, we must ever be ready to safeguard the best interest of the industries in which we are vitally concerned by fairly and justly placing before our Government all the bearings of the different subjects arising in respect of these industries, and, in doing so, we are only abiding by and fulfilling the provisions of our Charter of Incorporation. Have we done so in the past and what is the record of the Institute in that respect?

In the Appendix to this address will be found a list of all the discussions, resolutions and actions of the Institute on matters affecting the mining and metallurgical industries of the country as these took place from year to year. It is not a very long list, not as long as the list of our papers, as we are of course much more interested in technical matters during our annual meetings, but a study of it and a careful reading of all the discussions clearly shows that we have nevertheless been alive to the safeguarding of the best interests of the industries we represent, and according to the precept of our Right Honourable Premier in the language above quoted, by presenting our cases fairly and justly. The very best proof indeed of the constant justice and fairness of our course is that almost every recommendation made by this Institute has been adopted by our different Provincial Governments or by the Dominion Government. For instance in the three following important matters:—

First.—As this Institute strongly advocated, export duties on nickel-copper ores and mattes or on any other mineral were never imposed by the Dominion Government notwithstanding that this was advocated by many in the press and everywhere, and even was asked of the Dominion Government in an Order-in-Council

approved by the Lieutenant-Governor of Ontario on the 24th November, 1899.

Second—Notwithstanding that a law was passed in the Ontario Legislature in the session of 1900 empowering the Lieutenant-Governor in Council to impose, by proclamation, certain heavy taxes on nickel and nickel-copper ores and mattes and to remit these taxes in cases in which these ores or mattes were completely refined in Canada, yet the provisions of this bill were never proclaimed in force, and time has shown that the members of this Institute were on the just and right side in opposing strongly such an interference with the industrial independence of the mining community.

Third.—And again the Yukon royalty of 10% on the gross gold production, imposed by the Dominion Government, has been reduced to a 2½% royalty now collected on the gold exported, as strongly recommended by us in one of our memorials to the Government.

The above are our most important victories, but our influence has also contributed largely to many lesser achievements such as the successive defeats of a well known bill, brought forward with persistence year after year, and which we as persistently opposed because we considered that it would restrict and confine the practice of engineering within certain limits altogether too narrow; also the defeat of the Alien Labor Law in British Columbia and of the Eight Hour Law in the same Province. To this influence of the Institute and to our discussion on these matters is also due in no small degree the making of good roads in the Yukon, many improvements in the mining regulations of that district, the exemption of municipal taxation for the mineral properties of Quebec Province for another period of 10 years from 1899, the placing on the free list of gold dredging and other mining machinery, etc., etc.

There is also another subject of very great importance to the mining interests of this country to which this Institute has wisely devoted considerable time and attention on many occasions and in which, I am very glad to be able to record, our influence has also been the means of effecting substantial advance and progress. I refer to the question of what should the Dominion Government do in "Aid to Mining."

So far the Geological Survey of Canada has been almost the only "Aid to Mining" given by the Dominion Government. This Institute has always shown its appreciation of the good work of many prominent members of the Geological Survey, and has even advocated with some success, the payment of larger salaries to members of such a technical branch of the service. It has also often recommended larger, better and safer accommodations for the offices of the Survey and for the very valuable collections of its museum, and it is very gratifying to know that this is at last being provided for in an entirely new large building, the ground for which has been acquired by the Government in Ottawa and the plans of which have been prepared and decided on, and which is to be built immediately. Yet this Institute has felt and has fairly but firmly expressed during the important and lengthy discussions which took place on this subject during our annual meeting of 1902, that the Geological Survey as then organized and conducted, was entirely unable to cover all the ground which the "National Importance of Mining" and the many important interests served thereby, now need and demand in such a large and rapidly growing country as Canada, so rich in mineral resources of all kinds and so much of which is yet so entirely new and even unknown that it requires many thorough explorations, surveys and studies. We pointed out that the Geological Survey Department in charge of this work had not grown with the country, that it had practically

the same appropriation year after year for many years, and, therefore, that it was only natural if it was not keeping pace with the rapid mining and metallurgical developments of this country, and if it was lacking in many of the branches necessary for its complete usefulness. That it needed therefore to be reorganized and extended and converted into a "Department of Mines and Geological Survey".

At the end of the discussions, which should be carefully read in our Volume 5 by all who take an interest in the development of our mineral resources, it was unanimously resolved:—"That the Canadian Mining Institute, in annual session assembled, desire to direct the attention of the Federal Government to the magnitude and importance of our mining industry which, during recent years, has developed so rapidly; and respectfully urges an increase of Government aid wherever possible, and the establishment of a strong and practical Department of Mines, or of a Department which shall be devoted to the interests of the mining and metallurgical industries, and which shall include the Geological Survey and all other necessary branches."

These necessary branches were clearly pointed out during the discussions to be:—

Administrative branch.

Geological Survey, Paleontological and Botanical branch.

Geographical and Topographical branch.

Mining, Geological Survey and Monograph branch.

Statistical, Economic and Commercial Mining branch.

Chemical and Metallurgical branch.

I take pleasure in recording that the Dominion Government, through the Honourable the Minister of the Interior, has been gradually working on the lines of the above resolution and suggestions, and in complimenting the new geographical branch on the excellence of its work newly published, and we have no doubt that the other branches which have newly been or are being, organized will soon be able to make as creditable a showing.

This is the age of specialization, as we all know, and necessarily so since every branch of science, industry, commerce, or anything else, is getting to be such a vast and complex subject in itself, that the best specialists are often none too good to stand the sharp light and competition of such rapidly advancing progress. Therefore, it is only natural that the conclusions arrived at by members of this Institute, after exhaustive studies and discussions on the subject of "Government Aid to Mining", should have been that the work of the department of the Dominion Government specially devoted to the interests of the mining and metallurgical industries of the country should be specialized in different branches, each with as competent a head as it is possible to secure and all under the direction of one of our cabinet ministers; whether this cabinet minister be named Minister of Mines or Minister of the Interior, is a matter of little moment to us as long as the important work under his charge, in which we are vitally interested, is thoroughly and systematically done.

The work of such a department of the Dominion Government, as it was well pointed out during our discussions, would not interfere in the least with the mining rights, and the work in that connection, of our different Provinces, which have under their charge the making and administration of the mining laws of these Provinces; the selling thereby or leasing of the mineral lands; the inspection of the mines for the due protection of the safety of the miners and the prevention of waste; the keeping of proper maps, plans and records of their mines; the collection of dues, licenses, taxes or royalties on the mines of their Provinces; the collection of mineral and metallurgical statistics; the care of helping and

fostering technical education ; the Provincial public assay offices ; the making of better roads and other means of transportation in their mining districts ; the establishment of custom concentration and reduction of works ; the assistance in deep sinking or in testing deposits by diamond drills or otherwise ; the prompt issuance of notes, papers or bulletins on the newly discovered mineral districts of the Provinces, etc., etc.

There is only one more question of importance which has engaged the attention of our Institute especially at our last annual meeting which I need to record here to make this review complete, and that is the subject of mineral statistics.

This Institute has naturally always attached the greatest importance to a thorough statistical knowledge of the progress of our mining and allied industries from year to year, and many presentations of such statistics, and discussions upon them, have taken place at our meetings. From all of which it is quite clear that the correctness of such records, their prompt publication, their fullness and their clearness, is as apparent to us and to the success of our mining and allied industries as a true compass is to a navigator ; in fact as entirely indispensable to us as the needle is to that navigator. But, unfortunately, the mining bureaus of the different Provinces and of the Geological Survey, who collect and publish these statistical records for their Provinces and for the Dominion respectively, have adopted widely different standards of value, and even different systems of compilation and presentation, which have so far rendered these records of very much less practical value to the members of this Institute, and to the important interests of the country to be served thereby as they would otherwise have been ?

Taking this into consideration and after prominently discussing the subject at our last annual meeting we appointed a large committee of our members, including all the heads of the different official mining bureaus of the country, who are all members of our Institute, and who very kindly volunteered to assist our efforts in this direction of uniformity in these records. This committee has been at work and will continue its labor until it is able to report the accomplishment of the important results sought after.

In closing this imperfect review of the work of the Canadian Mining Institute in the past I beg to thank you all, gentlemen, for your kind attention and I will now formally declare the 1904 meeting of the Institute open for the reading of papers and the transaction of business.

APPENDIX.

DISCUSSIONS, RESOLUTIONS AND ACTIONS OF THE CANADIAN MINING INSTITUTE, YEARS 1899 to 1903 INCLUSIVE.

ANNUAL MEETING, MARCH, 1899—A petition respecting Yukon Mining regulations, forwarded to us from the Incorporated London Chamber of Mines and asking the help of this Institute in obtaining a number of changes in these regulations, especially with regard to the 10% royalty, was considered ; but, as the Secretary of the Institute stated that the Dominion Government had emphatically declared at that time that they would not make any rebate of that royalty, it was agreed that nothing could be done by the Institute at that time.

Discussion on the work of the Geological Survey, and resolution declaring appreciation of the services rendered to the mining interests of Canada by the work of the Geological Survey, and urging upon the Government the necessity of giving further financial support to that department, with a view to the increase of its work in the mining districts, and also of more adequately remunerating the services of the members of its technical staff.

Resolution authorizing the Council of the Institute to impress

the Provincial Governments with the necessity of maintaining their mining bureaus in a high state of efficiency and with the desirability of these bureaus adopting a more uniform standard of compilation of mining statistics.

Opposition to a bill of the Canadian Society of Civil Engineers restricting the rights of engineers to practice unless they become members of that society ; and authority conferred on the Council of the Institute to take the necessary steps to defeat the object of this bill in so far as it affects, or relates to, mining interests.

Resolution presented by the British Columbia members urging upon the Dominion Government the desirability of establishing a mint in British Columbia ; postponement of the question for further consideration.

SUMMER MEETING, BRITISH COLUMBIA, 1899—Resolution strongly disapproving of the passing of an eight hour law by the British Columbia Legislature and asking for its repeal.

ANNUAL MEETING, MARCH, 1900—Discussion on mining laws, during which the need of a mining law in the Yukon and other territories of the Dominion was pointed out.

Discussion during which the small size of the placer claims in British Columbia is pointed out and condemned, and during which the very bad results of the alien labor law of British Columbia in the Atlin district are pointed out.

Discussion of the conditions then existing in the Klondike, during which the building of roads in that district is strongly advocated as a necessity for the freer and cheaper transportation of supplies and of mining machinery, and for the good of the district in general.

Discussion on the 10% Dominion Government royalty on the gross output of gold in the Yukon, during which the onerous nature of that royalty is strongly brought out and condemned ; the Institute petitions the Dominion Government for the reduction of that royalty to 2%, for the collection of it on the gold as exported out of the district, and for the collection of correct statistics of the gold production of that district.

Discussion on the nickel question and on export duties, during which many of the members strongly disapproved of an Order-in-Council passed by the Ontario Government (24th November, 1899) asking the Dominion Government to impose export duties on nickel and nickel-copper ores and mattes, and proposing not to grant nickel-copper mining lands, in the future except under a condition providing for the cancellation of the grants in case the nickel and nickel-copper ores and mattes were not refined in the Province ; the meeting referred the matter to the Council with full power to act as it thought best.

ANNUAL MEETING 1901—A delegation of members of the Institute is appointed to urge upon the Government the great need of further accommodations for the museum and offices of the Geological Survey, and also to advise the payment of larger salaries to the technical officers of the Survey in order to retain and secure the services of the best men in the country.

Institute recommends that Dr. F. D. Adams, Logan Professor of Geology at McGill, be appointed successor to the late Dr. Geo. M. Dawson as Director of the Geological Survey of Canada.

Discussion on "Company Law", during which the provisions of the "Company Law" of England and of the Dominion to prevent the selling of stock below par are commended.

The secretary of the Institute reports that during the previous year (in April 1900) he and other members of the Institute, on behalf of the Institute, opposed the passage of the following bill introduced in the Legislature of Ontario by the Hon. the Commissioner of Crown Lands, namely : " An Act to Amend the

Mines Act". This Act provided that anyone mining iron ores, zinc ores, copper ores, nickel ores, nickel-copper ores or any other ores or minerals in the Province was to pay, in the future, very heavy taxes on the gross output of these minerals; these taxes to be remitted at the end of the year to those smelting and refining in Canada; the metals from these ores that after the strong recommendations made on behalf of the Institute against this Act, it was greatly modified, and all its provisions were struck off in respect to all ores and minerals except nickel and nickel-copper ores and mattes, and finally that an amended bill was passed by the Legislature (63 V. Cap. 13) in which:

First.—The Lieutenant-Governor in Council was authorized to put into force and effect by proclamation certain sections of the bill by which the following very heavy taxes upon the gross output of nickel and nickel-copper ores and mattes would be imposed, namely:—

- (a) For ores of nickel \$10 per ton, or \$60 per ton if partly treated or reduced.
- (b) For ores of copper and nickel combined \$7 per ton, or \$50 per ton if partly treated or reduced.

Second.—The Lieutenant-Governor in Council was also authorized to remit or refund these taxes, in part or in full, "where ores or minerals that have been mined, raised, or won in the Province are smelted or otherwise treated in the Dominion of Canada by any process, so as to yield fine metal or any other form of product of such ores or minerals suitable for direct use in the arts without further treatment."

The provisions of the above bill were fortunately never proclaimed into force and effect by the Lieutenant-Governor in Council, thanks to a large extent to the efforts of this Institute.

ANNUAL MEETING, MARCH 1902—The bill of the Canadian Society of Civil Engineers restricting the practice of engineering in Canada to members of their Society, is again before the Institute with some amendments, but after due consideration it is again decided to oppose it, and the Secretary is instructed to wire the Chairmen of the Private Bills Committees of the Ontario and Manitoba Legislatures protesting against the passage of any such legislation:—"Since it gives powers to said Society which should not be given to any one branch or section in the present condition of the engineering profession. Such powers should be retained by the Government itself or reserved for a society or association representative of the whole profession."

A very good discussion took place on "The National Importance of Mining" and how the Government of a country may promote the interests of mining, and the development of its mineral resources. At the end of this discussion the following resolution was adopted:—

That the Canadian Mining Institute in annual session assembled desires to direct the attention of the Federal Government to the magnitude and importance of our mining industry, which during recent years has developed so rapidly; and respectfully urges an increase of Government aid wherever possible, and the establishment of a strong and practical department of mines, or of a department which shall be devoted to the interests of the mining and metallurgical industries, and which shall include the Geological Survey and all necessary branches.

ANNUAL MEETING, 1903—Discussion on mining statistics and appointment of a committee of the Institute to report at the next annual meeting, and to suggest, if possible, a system of presenting mineral and metallurgical statistics acceptable to all the different Government Mining Bureaus in Canada, in order that complete uniformity be obtained in these important records of the Dominion and of the different Provinces.

After discussion it was resolved that this Institute, through its officers, urge on the Government of the Province of Quebec the necessity and importance of establishing in the city of Montreal a branch office of the Provincial Department of Mines.

Notes on some Special Features of Coal Mining in the Crow's Nest.*

By JAMES McEVROY, Fernie, B. C.

To one familiar with the methods of bituminous coal mining in an Eastern field, the successful management of a colliery in the West is not always an easy task. This is especially the case in the Rocky Mountain coal basins, where he finds himself face to face with conditions requiring considerable modification of his Eastern methods, if not an entirely different system of their own. A knowledge of the causes giving rise to the new conditions, helps him to meet them with intelligence, and to foresee and provide against any new difficulties which may arise.

The geological history of the eastern and western coals, when compared, show similarity if the two factors, "time" and "force" be left out of consideration. The eastern coals are practically all of Carboniferous age. A possible exception to this is in Virginia and Kentucky, where some of the coals may reach as high as the Triassic. Since their deposition they have gradually, at an infinitesimally slow rate of progress, been developed through the various stages from the original peat bed up through the different varieties of lignite to their present bituminous form. It is beyond the knowledge of man to ascertain the length of time which elapsed during this development. There was, generally speaking, little disturbance of the measures, and the beds are found to-day in altitudes more or less closely approximating their original horizontal position.

The western coals are chiefly of Cretaceous formation and consequently are four geological ages younger than the eastern ones. They have gone through all the same stages as the eastern coals, but their development has been accomplished in one half the time. (It may be stated here parenthetically that it still remains, in our modern times, a characteristic of the West to do things in one half the time).

After the deposit of the peat beds all those that are preserved to-day in the form of coal were covered by succeeding layers of clay, sand or gravels, which are now seen in the form of shale, sandstone and conglomerates overlying the coal. The accumulation of a great thickness of these superincumbent strata brought an intense pressure to bear upon the peat beds at the bottom and they were compressed to about one-twelfth of their original thickness. The continuation of this pressure and the consequent heat developed, gradually drove off the excess of moisture and more or less of the volatile constituents. Any movement of the strata resulting from the shrinkage of the earth's crust, naturally increased the pressure and heat and hastened the alteration.

It has been due to greater activity in these earth movements that the western coals have been altered to their present form in so much shorter time.

The Rocky Mountain region in most parts was the scene of tremendous movements, and great pressure is evidenced by the crushing, thrusting, folding, faulting and uplifting of the measures.

The, comparatively speaking, newer rocks, such as the Cretaceous, sometimes suffered equally with the older ones of the region, and some large areas which, under quieter conditions, would have produced valuable coal fields, were crushed and broken and eventually swept away by the denudation of succeeding ages. In other parts the movements were less violent, and where the pressure and heat were sufficient to produce the required degree of alteration of the coal without crushing the main portions of the

* Paper presented at the 6th annual meeting of the Canadian Mining Institute.

basins, some of the highest grade bituminous coals were found in good workable form.

The greater the degree of alteration, the more moisture and volatile matter were driven off, and the higher the percentage of fixed carbon remained. Near the axis of the Rocky Mountains the conditions were most favourable for the development of good coal and the percentage of fixed carbon is generally between 65 p.c. and 78 p.c. Going eastward from the axis of the Rockies, the pressure gradually diminished and the fixed carbon is found to decrease, while there is a corresponding increase in moisture and volatile matter in the coals. Continuing eastward the coals soon become lignitic in character and when the great plains are reached they are represented only by lignites proper.

The Crow's Nest field, situated just west of the main divide, suffered to some extent like the rest of the region. Its edges were turned up and a wider strip, now the Elk River Valley, was broken and carried away by erosion, but the main body of the field was lifted bodily up without any serious distortion. Generally speaking, the measures of the Crow's Nest field as they stand to-day, are bent upward all around the western edge of the field. The bending is almost universally gradual and regular, changing the altitude of the coal seams from horizontal to an extreme pitch of 40° in a distance of about three miles.

At three places on the western edge of the field, tributaries of the Elk River which run partly or entirely across the field have cut out deep valleys, thus making the coal seams accessible by level entries at places where the seams are more or less closely approaching the horizontal position. The highest seams in the main group of coal measures are exposed at points farthest up the valleys and, consequently, they are lying flatter than the lower ones where the latter are exposed by the same streams lower down and nearer to the edge of the basin.

At Morrissey, Fernie and Michel, situated respectively on the three transverse streams before mentioned, the Crow's Nest Pass Coal Company is carrying on active mining operations. At Coal Creek (the oldest of these collieries) the upper seams are lying in altitudes varying from horizontal to a dip of 15°. The lower seams on the same creek dip as high as 20°. At Morrissey the dips vary from 8 degrees to 24 degrees, and at Michel, they run from 15 degrees to 35 degrees.

It is evident that a system of mining and handling the coal in a *flat* seam will not apply to all these cases. Where the dips are moderate, the equipment is simple like that for a flat seam, horses drawing the cars from the working places to the main haulage roads. With the steeper dips, incline planes are used on which gravity does the work of lowering the cars to the main roads. Horses are then only employed on the secondary levels. Rooms are driven up the pitch from the levels and in each room there is a simple self-acting incline, or "McGinty", which is operated by the miners themselves. Where the dip approaches 35 degrees, chutes are used in the rooms and the coal is drawn from these into cars on the levels.

To obtain the greatest economy in handling the coal, the main haulage roads must be carefully laid out to take every advantage of the ground. Incline planes must be so located as to concentrate the work of lowering the cars. For this reason each incline is laid out so that it takes the cars from a set of rooms, 15 to 20 in number, on each side at every successive level. Without a proper system and equipment, the cost of handling the coal in a pitching seam is greater than for a flat one, but these once being installed, the arguments are by no means all in favor of the flat seam.

The physical and chemical properties of the coal depend to some extent upon the amount of cover now overlying the seams, but are affected to a greater extent by the pressure which has been exerted by the bending of the measures and by the manner in which the strata have yielded to the bending movement.

Where the seams are lying flat, or nearly so, assays like the following one, made from a sample specimen of coal from the face of No. 2 Mine, Coal Creek, are usual:

Moisture	0.41
Volatile matter	24.78
Fixed carbon	68.36
Ash	6.45
	100.

The bodily tilting up of the seams when unaccompanied by bending does not materially affect the constituents, as may be seen from the following assay of an average specimen from the face of the main level of No. 8 Mine, at Michel:—

Moisture.....	0.99
Volatile Matter	23.64
Fixed Carbon	67.99
Ash.....	7.38
	100.

The seam on which No. 8 Mine is operated is tilted up to an angle of 30 degrees to 35 degrees without bending.

Where the measures are bent even slightly, if it continues for some distance to either side, there is a noticeable increase in fixed carbon and a corresponding decrease of volatile matter. The resulting coal is rather better in quality, having greater heating power.

An example of this may be taken from No. 4 Mine at Michel, across the valley from No. 8, where the measures are dipping about 15 degrees and where the altitude of the rocks outside shows that there was a slight bending movement; the assay from No. 4 Mine is as follows:—

Moisture	0.63
Volatile Matter	21.44
Fixed Carbon.....	73.85
Ash	3.23
Sulphur.....	.85
	100.

A similar example may be taken from No. 1 Mine at Morrissey where the bending conditions are more pronounced:—

Moisture.....	0.65
Volatile Matter.....	13.48
Fixed Carbon.....	78.88
Ash	6.40
Sulphur.....	0.59
	100.

These assays were all made by Mr. R. W. Coulthard.

As regards physical properties of the coal it appears that when the roof and floor have held the coal under intense pressure during the bending movement, the coal remains firm. In some instances, however, this has not been the case and the roof and floor have apparently yielded readily to the induced lateral pressure, allowing the seam to "thicken out". The result is, then, that a certain amount of shearing has taken place and the coal mines freely, producing a higher percentage of slack. This is an advantage rather than otherwise, where so much slack coal is needed for making coke, as it saves the cost of crushing lump coal.

THE CROW'S NEST PASS COAL COMPANY, LTD.

Directors' Report.

(Presented to the shareholders at Toronto, February 12, 1904.)

The Directors beg to submit to the Shareholders of the Company their Seventh Annual Report, including Statement of Assets and Liabilities as of the 31st December, 1903.

The balance at the credit of Profit and Loss Account brought forward from 1902, amounted to \$950,511.96. To this has been added the sum of \$310,492.28, being the Company's net profits from the operations of the year, also the sum of \$913,526.25 representing the premium received on calls paid on new stock; the whole making an aggregate to the credit of the Profit and Loss Account of \$2,174,530.49. From this amount the Directors have paid four dividends of 2½ p. c. each making 10 p. c. for the year, and amounting in all to \$303,717.36. This amount deducted from the above balance at the credit of Profit and Loss, leaves at the credit of that account, carried forward to 1904, the sum of \$1,870,813.13.

The balance of the new issue of stock referred to in the last Annual Statement as to be paid during the year 1903, amounted to, including the premium, \$1,646,318.75. On the 31st December last this had all been paid, with the exception of \$123,775.00, (of which \$74,265.00 is premium).

Substantial progress was made during the year in the permanent development of the Company's properties at Coal Creek, Michel and Morrissey. It was not until the first of February, 1904, that the mines at Coal Creek, which had been damaged by the explosion of the 22nd May, 1902, were fully restored.

During the year nearly a million dollars have been spent on plant, development and machinery, adding largely to the efficiency and capacity of the mines and of the operating and coking plants.

The steady increase in the production of coal is best illustrated by pointing out, that the output for the year just closed, exceeded that of 1902 by 49.83 p. c., while the output for December, 1903, is larger than that of January of the same year by 58.72 p. c. This satisfactory progress has been made, notwithstanding that production was materially retarded by a strike of all the company's miners, lasting from the 11th February to April 1st, and to a less degree by the strikes of the coke oven men in May, and of the miners at Morrissey in September. A contract has been executed with the men, providing for wages, hours of labor and other usual matters, effective for three years, but determinable by either party at the end of the second year, and it is expected that there will be no more labor troubles during the life of this agreement.

The mountain slide at Frank, which covered up the Canadian Pacific Railway Company's main line in the Crow's Nest Pass, gave rise to a car shortage of considerable duration, as did the handling of the western harvest in the months of October and November, both of which shortages interfered to a considerable extent with the transportation, and therefore with the production of coal and coke.

The Accounting work has been separated from that of the Operating, and a new department created to take care of this and the Purchasing, and Mr. Daniel Davies has been appointed Comptroller in charge of this department.

Mr. T. R. Stockett, jr., is now Acting General Manager and it is hoped that the confidence that his record as General Superintendent for several years has earned for him will be confirmed by his work as Acting General Manager.

The duties formerly performed by the Managing Director have been assigned to the office of the Third Vice-President, and are now being very satisfactorily performed by Mr. G. G. S. Lindsey, who has been elected to that position.

The Directors regret that Mr. R. W. Macpherson, the General Auditor of the Company, will after the Annual Meeting sever his connection with the Company, a loss which will be much felt.

All of which is respectfully submitted.

G. G. S. LINDSEY,
Third Vice-President.

GEO. A. COX,
President.

TORONTO, February 12th, 1904.

PROFIT AND LOSS ACCOUNT, FOR YEAR ENDING 31ST DECEMBER, 1903.

Balance at Credit Dec. 31, 1902.....	\$950,511 96	
Net Profits for 1903.....	310,492 28	
Premium received on calls paid on new stock.....	913,526 25	\$2,174,530 49

APPROPRIATED AS FOLLOWS:

Dividends Paid.....	\$ 303,717 36	
Balance carried forward to 1904.....	1,870,813 13	\$2,174,530 49

GENERAL STATEMENT, 31ST DECEMBER, 1903.

ASSETS.

Mines, Real Estate, Plant, Development, etc....		\$5,418,435 51
Cash in Banks.....	\$ 66,551 31	
Accounts Receivable.....	313,660 79	380,212 10
		\$5,798,647 61

LIABILITIES.

Capital Stock Paid Up.....		\$3,450,490 00
Bills Payable.....	\$145,000 00	
Accounts Payable.....	250,265 64	395,265 64
Dividend No. 12, Accrued.....		82,078 84
Profit and Loss.....		1,870,813 13
		\$5,798,647 61

INDUSTRIAL NOTES.

In our February issue the advertisement of the Riblet Patent Automatic Aerial Tramway stated that one man "can handle 1,200 tons per day." More recent information has shown the capacity of this tramway to be fully one third more, or the sum of 1600 tons per one man in 24 hours. The advertisement has been altered to the above figures.

In the interests of the Kootenay mining district petroleum has been transferred to the free list, by Order-in-Council, when it is imported for the concentration of ores by mine owners or mining companies for use only in concentrating establishments belonging to such mine owners or mining companies.

The Allis-Chalmers Co. advise, by circular, that its already large business is to be expanded. The Company is now associated with the Turbine Advisory Syndicate of England, and is prepared to build steam turbines in units from 500 to 1000 K. W. for use in the United States, Canada, Mexico and South America. The Company has also acquired licenses and patents which enable it to supply the famous hydraulic machinery of the Swiss firm of Eschen-Wyss & Co., and the gas engines of the German Company known as the Nurnborg Machinery Co., in sizes ranging from 260 H. P. to 6,000 H. P.

The Sullivan Machinery Company, Chicago, reports that owing to the growth of its business, it is making several changes in the addresses of its different offices this spring to secure larger quarters and increased facilities. The New York office, Mr. A. E. Blackwood, Manager, is now located at 42 Broadway, Rooms 1427-28, instead of the Empire Building, 71 Broadway, where it has been located up to this time. On the 1st of April, the Pittsburg office, Mr. Geo. W. Favor, Manager, will move from the Schmidt Building, 339 Fifth Avenue to the Farmers' Bank Building, where it will occupy rooms 1112-13. On or about April 15th, the general offices located heretofore at 135 Adams St. Chicago, will move into the newly completed Railway Exchange Building at the corner of Jackson Blvd. and Michigan Avenue where they will occupy Rooms 1502-14 inclusive.

The Allis-Chalmers Co., announce that their new electrical machinery depart will be in charge of Mr. John F. Kelly and Mr. Wm. Stanley; both formerly of the Stanley Electric Co.

The announcement is also made that Mr. Philetus W. Gates and Mr. Henry W. Hoyt, respectively General Superintendent and Second Vice President of the Allis-Chalmers Company, are about to retire from active participation in the management of that Company.

Mr. Gates was president and Mr. Hoyt secretary and general manager of Gates Iron Works for fifteen years prior to the incorporation of the Allis-Chalmers Company in 1901. The late P. W. Gates (father of Philetus W. Gates) was the pioneer manufacturer of Chicago and the region west of the Alleghenies, having established his business in 1842. From 1861 to 1871 the Eagle Works Manufacturing Co., of which he was president, employed about one thousand men, and in those days was a noteworthy industry. In 1871 the Eagle Works Manufacturing Co., went out of existence and from it were organized Gates Iron Works and Fraser & Chalmers, each taking a portion of the business. Both of these companies in turn were taken over by Allis-Chalmers Company in 1901.

Messrs. Hoyt and Gates after a well earned vacation spent in travelling, will re-engage in business in Chicago.

The Dominion Iron and Steel Company have ordered from a Pittsburgh firm, a coal washing plant of a capacity of 100 tons per hour; with an agreement to duplicate the plant, (thus giving a total capacity of 200 tons per hour), if conditions are satisfactory. The date for the completion of the first unit is, May 15, 1904.

The new General Manager, Mr. Graham Fraser, is busily engaged in effecting economies of production, and in determining what are the profitable lines of business of the Company.

It is reported that many of the finer lines of iron and steel manufacture which have been contemplated will not be taken up at present, but that the rolling mill will be kept at work on rails of standard sizes and dimensions.

The Executive Committee of the Dominion Coal Company held a meeting at Montreal on the 2nd instant, at which the Annual Report was submitted and discussed.

The output for 1903 (3,079,563 tons) fell slightly below that for 1902, by about 80,000 tons, owing to the fire at Dominion No. 1 Mine. The net earnings for 1903 were \$1,756,023.68, or \$398,932.31 less than in 1902. The fire above mentioned, with the increased cost at the other pits due to the enforced high pressure of working to fill existing contracts, is responsible for the decreased net earnings.

The dividend since the divorce from the Steel Company, has been at the rate of 6 p. c. per annum.

The demand for coal has considerably decreased during the last six months owing to depressed trade conditions at home and abroad, and the price per ton realized has also been diminished. The present business of the Company, however, is highly satisfactory and shareholders can keep easy minds.

The Nova Scotia Steel & Coal Co., Ltd., held a meeting of its directors in Montreal on Saturday, the 12th inst. The report of the General Manager showed the Company's business during the past year, to have been the largest and most profitable in its history. The profits for 1903 were \$859,397.19, against \$609,935.25 for 1902. The output from the coal mines was very much increased and the iron and steel plant was fully occupied throughout the year.

The regular quarterly dividend of 2 p. c. was declared on the preferred stock, and a semi-annual dividend of 3 p. c. on the common stock was also declared, both payable April 15th

Imports of mining machinery into Canada during 1903 were very large, the total value thereof being \$1,281,185. Most of the machinery imported was supplied by manufacturers in the United States, the value of the imports from this source being \$1,206,465, while from Great Britain machinery to the value of \$61,425 was imported. Great Britain, however, supplied us last year with nearly double the quantity of wire rope to that furnished by the United States.

Imports of mining machinery, 1903...	\$1,281,185
" " " " 1902.	851,339
Increase for 1903	\$429,846
Imports from United States.....	\$1,206,465
" " Great Britain.....	61,425
" " all other countries.....	13,295
Total.....	\$1,281,185
Imports of Wire Rope from Great Britain....	\$119,135
" " from United States....	60,676
" " from other countries..	6,153
Total.....	\$185,914

The following comparative table of coal shipments in 1902 and 1903 will illustrate the active conditions which prevailed in the coal industry in Nova Scotia during the year just passed:—

Name	1902 Tons	1903 Tons
Dominion Coal Co.	2,939,991	2,802,134
N.S.S. & C.C., including M. M.	268,704	451,993
Cum. Ry. and C. C.	435,791	435,716
Acadia Coal Co.	278,838	337,213
Intercolonial Coal Co.	200,581	232,056
Inverness Coal Co.	67,399	165,738
Port Hood Coal Co.	39,007	77,940
Gowrie & B.H.	18,700	23,330
Maritime Mining Co.	1,700	19,700
Sydney Coal Co.	9,290	12,909
Joggins Mine, Approx	50,000	50,000
Minudie Mine, Approx	15,000	20,000
Cape Breton Coal Co.	10,000	10,000
Other Collieries.	10,000	12,000
Totals.....	4,345,000	4,650,000
Increase 1903.....		305,000

Germany reports the following figures of the consumption of foreign copper for January, 1904:—

	1904 Tons.	1903 Tons.	1902 Tons.
Imports.....	9,391	6,829	9,705
Exports.....	676	795	1,482
Consumption.....	8,715	6,034	8,223

NEW COMPANIES.

BRITISH COLUMBIA.

New Imperial Mines, Limited.—Incorporated 20th February, 1904. Authorized capital, \$100,000 divided into two thousand shares of \$50.00 each. Formed to carry on the operations of a Mining Company in the Province of British Columbia, or elsewhere in the Dominion of Canada.

Yale Hydraulic Mining Co.—Registered as an Extra-Provincial Company 22nd February, 1904. Authorized capital, \$50,000 divided into one million two hundred and fifty thousand shares of four cents each. Head Office: Whatcom, Washington, U.S.A. Canadian Office: Robie Lewis Reid, New Westminster, B.C., Attorney.

Pacific Mineral Extraction Co., Limited.—Incorporated 29th January, 1904. Authorized capital, \$100,000 divided into one hundred thousand shares of \$1.00 each. Formed to acquire and take over as a going concern the business now carried on at the City of Vancouver, B.C., of the "Universal Gold, Silver, and Platinum Extraction Syndicate."

Richard III Mining Co., Limited.—Incorporated 15th February, 1904. Authorized capital, \$650,000 divided into six hundred and fifty thousand shares of \$1.00 each. Formed to carry on the operations of a mining company in all its branches.

Spy Glass Mining and Development Co., Ltd.—Incorporated 11th February, 1904. Authorized capital, \$500,000 divided into five hundred thousand shares of \$1.00 each. Formed to carry on the operations of a mining company in all its branches.

Queen-Dominion Mining Co., Limited.—Incorporated 17th February, 1904. Authorized capital, \$500,000 divided into five hundred thousand shares of \$1.00 each. Formed to carry on the operations of a mining company in all its branches.

Golden Copper Mining Co., Limited.—Incorporated 29th February, 1904. Authorized capital, \$200,000 divided into two million shares of ten

cents each. Formed to carry on the operations of a mining company in all its branches.

"The Bentley Iron Mining Company, Limited," Non-Personal Liability.—Incorporated under the Statutes of British Columbia, 9th March, 1904. Authorized capital, \$30,000 in thirty thousand shares of one dollar each. Formed to acquire the properties known as "The Bentley Iron Mining Company, Limited."

"The Cascade Copper Mining Company, Limited, Non-Personal Liability." Incorporated under the Statutes of British Columbia, 10th March, 1904. Authorized capital, \$250,000 in one million shares of twenty-five cents each. Formed to acquire the properties known as "The Bentley Iron Mining Company, Limited."

Reliance Gold Mining Company, Limited," Non-Personal Liability.—Incorporated under the Statutes of British Columbia, 5th March, 1904. Authorized capital, 600,000 in six hundred thousand shares of one dollar each. Formed to acquire the properties known as the "Reliance Gold Mining and Milling Company, Limited."

ONTARIO.

The Aberdeen Development Company, Limited.—Incorporated under the Statutes of Ontario, 12th February, 1904. Authorized capital, \$300,000 in three hundred thousand shares of one dollar each. Directors: H. Wile, M. Wile, M. Peccard, S. Schlesinger. Head Office: Township of Aberdeen, District of Algoma. Formed to acquire the properties known as "The Aberdeen Development Company, Limited."

MICA NOTES.

There seems to be a change for the better in the mica market, which was very quiet in 1903, owing to the mica merchants of the larger centres, holding back their larger orders in anticipation of a further fall in prices, especially for the larger sizes. From reliable reports received, it appears that there is a slackness in the supply of East India mica to London, and it is said that the principal buyers will have to look in future for their requirements to Canada. The old phosphate mines, which were operated some 15 to 20 years ago in the Ottawa Valley and in the Lievre District, exhibit all more or less the occurrence of mica in connection with the Apatite deposits, in some instances to such an extent that the quality of the phosphate was seriously impaired. There appears to be no doubt that, if operations in many of these mines were resumed and if the demand for mica increases, this industry will assume larger proportions and the Lievre and Ottawa Districts will once more come to the fore as prominent producers.

The Blackburn Mine in the XI Range of the Township of Templeton has a record for over 30 years as a phosphate and mica producer. Up to 1893 this mine was worked for phosphate alone, but it had to cease operations owing to the depressed condition of the phosphate market; during these operations large deposits of mica were met with, but, were then thrown, as useless, into the waste dump. Since the year 1893, when the demand for mica commenced, the mine has been worked exclusively for this mineral, and large quantities have been extracted. The mine has attained a depth of about 300 feet, a force of 70 to 80 men being steadily employed; it is equipped with a large steam and electric plant and has all accessories for the preparation of the mica for the market.

The Wallingford Mica Co. is working its properties (lots 16 and 17 in the 5th Range of Templeton and the Battle Lake Mines, which comprise lot 6 and 7 in the 13th Range and lot 9 in the Gore of Templeton). On lot 16 in the 5th, a shaft has been sunk to a depth of 225 ft., on a solid vein of mica striking in an east and west direction, with a width from 8 to 13 feet. This mine has been worked without interruption since 1892. The vein which shows well defined walls has yielded a very large amount of marketable mica of good quality, and there seems to be a supply of mica for years to come. The other properties belonging to the Wallingford Mica Co., (the Battle Lake Mines) were worked for phosphate in the early eighties. Recently these properties were thoroughly explored for mica, and discoveries have been so encouraging that operations on a large scale have been commenced. This mine is also equipped with a good plant and accessories for deep shaft mining.

The Wakefield Mica Co. owns a mica mine on lot 16 in Range 2 of Wakefield. A shaft to a depth 175 feet has opened up a solid vein of mica and calcite with a width of from 5 to 8 feet. This mine has been in operation for about 9 years and has yielded a very large quantity of mica of excellent quality. Owing to a disagreement amongst the shareholders, the Company at present is in liquidation.

Canada Industrial Company, Limited. There is a current report that this Company, (which has its head office in Montreal) will resume operations on their extensive properties in the Templeton District. Most of these properties were worked for phosphate some 12 years ago, and in the course of working mica was met with in nearly all the pits.

Big Fall in Anthracite Output.

The January output of anthracite coal, according to the official figures, amounted to 3,726,786 tons, a decrease of 2,238,164 tons as compared with January, 1903, when 5,964,950 tons formed the greatest monthly production of anthracite on record. The large decrease in tonnage has been the result entirely of changed conditions. At the former time the country was just recovering from a six months' strike and every ton of anthracite mined was in demand, while during the past month conditions were on a normal basis.—Exchange.

MINING NOTES.

A report has been received that the mill of the Mountain Lion Mine at Republic, Washington, U.S.A., has made a run in low grade ore with a very successful saving of values, the percentage of recovery being 83. The ore was ground so fine that 39 p. c. passed an 80 mesh sieve; the value of the ore treated is not stated.

The Canada Corundum Company, Limited, announces the completion of its new mill, and that it is now ready to supply the wants of all customers.

The Paradise Mine in East Kootenay is steadily shipping ore; many hundred sacks of ore are already stored in the warehouse at Wilmer Landing on the Columbia River, and will be shipped thence early in the season.

The North Star Mine is making steady shipments to the Hall Mines smelter at Nelson. The rate of output is about 100 tons per week, besides which the work of development is being continued.

It is announced that mining and concentration work at the Ruth Mine, in the Slovan, has been suspended. Both the mine and concentrator have been steadily at work since June 1903, and the suspension will prove to be only temporary.

The Four Mile District announces a new streak of high grade ore on the Lew Dillon group, near the Fisher Maiden.

The Athelstan Mine, in Wellington camp, has been making regular ore shipments during the winter, some twenty teams are employed in the hauling of ore from the mines to the spur track at the Winnipeg Mine, from which shipments are made to the smelters at Granby and Greenwood.

A regular pay-day has been proclaimed at the Great Northern Mines, Limited, near Camborne, and the 15th of each month is the day which has been appointed. The amount of the monthly disbursements aggregate in the vicinity of \$4,000. The Oyster mines disburse a similar amount monthly.

The Rossland Power Company has been employing about sixty men in the work of constructing a 200 ton concentrating plant, which it is hoped will be running in about three month's time. This Company will handle the low grade ores coming from the War Eagle and Centre Star Mines, and its success will occasion the employment of a considerably larger force of miners.

The White Bear Mines announce that it will begin the construction of a 100 ton concentrating plant in about a month's time.

Press despatches advise that the Velvet—Portland Mine near Rossland, will resume operations shortly, and that the corporation will begin the construction of a 100 ton smelting plant.

Rossland reports that 900 men are employed in the mines of that camp at the present time, and that the number does not vary much from week to week.

The Granby Consolidated Mining Smelting & Power Company report that it is smelting in the neighbourhood of 2 000 tons per day at the present time, and that the furnaces are kept in continuous operation. On the authority of an interview with Mr. Flumerfelt, it is stated that the management have in contemplation the doubling of the present capacity, increasing the total number of furnaces to twelve, thereby enabling the plant to reduce 4,000 tons per diem. This report lacks the confirmation of the President.

The B. C. Copper Company have issued a circular which announces that the plan of consolidating with the Snowshoe Co., which has been under consideration, has been abandoned. The plan failed because each Company made stipulations which the other could not meet.

The International Coal & Coke Company, operating in the Eastern Crow's Nest Pass field, have been doing business since the first of the year. The Company controls the town site known as Coleman, which is growing rapidly. A battery of 100 coke ovens is now building, and railway spurs are being run to the different mines opened, some 200 men are employed, and the output at the present time is in the neighbourhood of 3,000 tons of coal monthly.

Some optimistic spirits have the belief that the shallow placers of Lardeau Creek, near Trout Lake, will pay for working and have secured a five years lease of one-half a mile on the creek and have also obtained water rights on Half-Way Creek. Their scheme involves the building of a flume which will take the tailings from hydraulic directly into Trout Lake. The reported tests of the gravel are high, but these tests remain unconfirmed.

The International Nickel Company suffered a severe loss on the 19th of February, in the burning of the concentrating works at Copper Cliff. The loss is estimated at about \$175,000, on which there was an insurance of about \$90,000. The works had only been erected some three and a half years, and were built by the Orford Refining Co., for the purpose of concentrating the matte from the Canadian Copper Co. The final refining was done at the Orford Company's refinery at Constable Hook, N. J.

Our readers will remember the death of Mr. Hosking, a miner at the Le Roi No. 2 Mine, who was drowned in September, 1902, while working at the bottom of the main shaft which was suddenly flooded by a party of miners, in a drift above, suddenly holeing through into the bottom of an old shaft which was filled with water. The widow and her two sons sued the Le Roi No. 2 Company, and they recently obtained a verdict from the jury of \$3,223.50 and costs against the Le Roi No. 2 Company.

At the time of the explosion at the Coal Creek Mine of the Crow's Nest Pass Coal Company, in 1902 a number of miners were killed. Damage suits,

aggregating something like one hundred in number, were brought against the C. N. P. Coal Company. On the 12th of February, a decision was obtained in the Courts of Ontario on the first seventeen cases, which suits were brought by the Italian Consul at Toronto for the estates of the deceased miners; these suits were all dismissed. The remaining suits will be tried at the Assize Courts in British Columbia next May, and, by order of the Court, only four of the whole number of cases will be tried; from the decision on these four a verdict will be rendered in all the remaining suits.

The value of the gold recovered from the districts of Atlin Cassiar and Omenica in British Columbia during the season of 1903, totals between \$400,000 and \$430,000 as made up from the returns obtained from the Banks and Express Companies; to this amount may be added about \$50,000 which fairly represents small parcels of metal taken out by individual miners of which no record is available. The production from the Omenica District was insignificant, not reaching to the value of \$10,000.

The year 1903 in New Zealand shows an increase in the gold production of that colony of 25,269 ozs. of gold, and 186,477 ozs. of silver. The total gold produced for the year was 479,798 ozs., of the value of \$9,917,414.

The Russian Department of Mines reports the production of platinum for the year 1903 at 204,892 troy ozs., a reduction of 29,986 ozs. from the product of the year 1902.

The second ordinary general meeting of the Canadian Ore Concentration Limited, was held on the 22nd February, at the offices of the Company at Salisbury House, London Wall, London. Mr. Ernest E. Sawyer presided, and stated in regard to the experimental plant of two units, erected for the Le Roi No. 2 at Rossland, that \$2.00 per ton should be the very outside cost of working. The consumption of oil per ton of ore treated had been 1.03 gallons, and there was a concentration of 16 tons of ore into one; the assay of the final tailings was 75 cents per ton in gold, 15 cents per ton in silver, and one-tenth of one per cent of copper, which losses were regarded by the corporation as being satisfactory. Mr. Stanley Elmore, one of the inventors, gave the meeting the actual figures above quoted, and stated that orders had been secured for a plant at the White Bear Mine at Rossland, and the Massey Mine in Ontario, and that negotiations for plants were pending with other mining companies in Canada.

The London *Critic* is not taking an optimistic view of the condition of Le Roi No. 2 Mine, as shown by the Company's report for the past year. It appears that the Company for that period reported the magnificent sum of £6,208 sterling as earnings, which only permits declaring the small dividend of one shilling per share, or one per cent. on the capital stock; a balance is carried forward of £9,741. The *Critic* is of the opinion that this balance cannot be maintained, and that there will be more reports of a pessimistic nature. Quoting from the report of the new manager, Mr. Alex. Hill, he says (as to the Josie Mine): "It would appear to be beyond doubt that the lower levels of this mine are of no value, nor do I believe that any enrichment is likely to occur with greater depth. I expect to be able to extract ore of good quality for the next year, or one and a-half years, but if no further discoveries are made, then all the good ore will be exhausted and the life of the mine may then be considered ended." Similar pessimistic remarks are made in regard to the No. 1 Mine, so that prospects are anything but bright, and the shareholders can only wait to see if anything turns up.

South Carolina's Phosphate Industry.

A POSSIBLE CHANCE FOR THE REVIVAL OF THE INDUSTRY IN CANADA.

The following clipping from an exchange shows that some of the sources of Southern phosphates are rapidly approaching exhaustion. It would therefore be well worth the while for owners of phosphate lands in Canada to examine the present market conditions.

The operations in the mining of South Carolina phosphate for 1903 and the amount of royalty received, show a steady decrease, and where ten years ago the State treasury received nearly \$300,000 in royalty this year the amount is little over \$15,000. This amount is \$12,157.68, less than that received the previous year, the total being but little more than half what it was in 1902. There are five companies in the field, the decrease in the number of tons mined being in the neighborhood of one-half, and if the same proportionate decrease continues as it has done in previous years there will soon be no revenue whatever from the industry. The following is a comparison for 1902 and 1903:

	Tons
December 1, 1902, to November 30,	
1903	45,003
During 1902	86,284
Decrease	41,281
Estimated on hand November 30, 1903	16,810
During	37,314
Decrease	20,504
Amount shipped during 1903	60,536
During 1902	108,416
Decrease	47,880

The royalty in 1903, for shipments, amounted to \$15,133.97, against \$27,291.65 in 1902.

The amount mined by the several companies is as follows: Coosaw, 369 tons; Central Phosphate Co., 33,706; Beaufort Phosphate Co., 3,200; "Empire," Virginia-Carolina Co., 73; Stono mines, 7,655.

Important to Shippers of Mining Machinery and Supplies to the Yukon.

Regulations of 30th April, 1898, re Entry of Goods into the Yukon District via Skagway, Alaska.

"Goods purchased in Canada, duty paid or free, and goods the produce of Canada, which are carried through Alaska free of United States Customs duties, may be admitted into the Northwest Territories of Canada free of Canadian Customs duties when transported by water from ports in Canada, under Regulations prescribed by the Minister of Customs: Provided, that the identity of the goods shall be established to the satisfaction of the Collector of Customs at the Port of Entry."

The following regulations and conditions are prescribed for the transportation of the goods aforementioned when carried by water from ports in Canada:—

(a) A manifest or invoice containing a description of the goods and their value, with the numbers and marks of the packages, shall be presented to the Customs Officer at the Canadian frontier port in the Yukon District or Stickeen.

(b) The certificate of a Canadian Customs Officer is required to be endorsed on the manifest or invoice to the effect that the goods described therein have been "shipped duty free from a Port in Canada."

(c) The certificate above mentioned may be granted when the shipment by water from a Canadian port is made by any vessel authorized to engage in such transportation.

The Dominion Coal Co's New Mine.

The new mine which the Dominion Coal Co. is planning to sink will rival the present Dominion No. 2 Colliery, which is the largest on the Continent, and on which work was begun three years ago. James Ross, F. L. Wanklin and J. Reid Wilson have been at Sydney, N. S., several days examining the situation and surveys of the various proposed sites, and it is stated on high authority that Big Glace Bay, four miles from Glace Bay, will be chosen. Port Morien and Low Point are also mentioned.

Should Big Glace Bay be selected a railway will be built from the colliery to Caledonia, where shipments will be made to either Sydney or Louisburg. A big bridge will be erected over the Big Glace Bay lake in connection with the new railway line. It is understood that when the new colliery is in operation, the International mine at Bridgeport will be abandoned. The Phalen seam will be worked at the new colliery, together with a large submarine area. The opening of the proposed colliery will eventually mean the base of employment for 3,000 men.

Report of the Electricity in Mines Committee.

The Electricity in Mines Committee has now issued its report, and have appended a formidable list of model rules. The tenor of the report appears to be, that electricity is destined to play a very large part in mining of the future, and that any legislative measures that may be passed should be such as would tend to render it safe rather than to prohibit its use.

The use of electricity is likened to the use of explosives in mines which are of great potential danger, but which, with proper precautions may be employed to distinct advantage with comparative immunity. It is also pointed out that the application of electricity to mining work is still in its initial stages, and that greater safety will come with experience. There can be little doubt that the accidents which have been caused by the use of electricity in mines have been due in a great measure to ignorance, in some cases the ignorance of the engineers who were responsible for the installation, and in others the ignorance of the individual workman. These are evils which time will practically eliminate.—*Mining Engineering*, March 1904.

Self-Hardening Steels.

One of the recent notable developments in the metallurgy of steel has been the manufacture of what is known as self-hardening or high-speed steels, which are adapted for tools working at a high rate of efficiency. There is a great variety of these steels on the market, and they show wide differences in composition, although usually containing some of the rarer metals, such as tungsten, molybdenum and chromium. Tools made from these steels can work without injury at a temperature of 500° or 600° C.

Coal Compression Before Coking.

It has not been thoroughly ascertained as yet by scientific investigation why the coking properties of coal are influenced by stamping or compressing, and while it is only imperfectly understood how the process is affected by external or mechanical influences, it is a fact that compressing of coal improves its coking qualities. An explanation of this could perhaps be that, in using coal of a low percentage of volatile matter, the voids between the particles of coal are too large for the small available quantity of products of distillation necessary to exert a binding influence. It may, therefore, be assumed that by compressing the coal and reducing the spaces, bringing the particles of coal closer together, a firmer binding is effected.

Whatever the theoretical explanation may be, the practical advantage of compressing the coal before coking is that the coking capacity is increased, which enables a poor coking coal to be converted into a more or less reliable coke. The output of available coke is also increased by several per cent., as the percentage of small coke and dust is reduced to a minimum.

By stamping, the coal is reduced about 30 per cent. of original bulk. On account of the small clearances allowed between the cake of coal and the oven walls, the coal cokes less to the walls, and the pushing out of the coke is greatly facilitated, whereby the wear and tear of the walls is very materially lessened. In consequence, in building new ovens the oven walls can be made quite parallel, which is of great importance in the even heating up, and also reduces the cost of construction. The coking time proves to be about the same whether the oven is working on stamped or unstamped coal. The coke made from the machine-stamped coal is particularly suitable for the production of pig iron, as by the use of such coke the quantity necessary for the blast-furnace process is from 10 to 15 per cent. less in bulk than when using coke from unstamped coal.

All these advantages constitute the main reason why such keen interest has of late been manifested in the question of coal stamping; advantages which not only enable coal of poor quality to be utilized for coking purposes, but also are conducive to the saving of time and labor in the case of such coal thoroughly suitable for coking.—*Mines and Minerals*.

MISCELLANEOUS.

Canadians understand the value of good roads in the mining regions. As soon as gold was discovered in the region of the Klondike the Dominion Government immediately began the construction of roads leading from Dawson to the camps. It now has 225 miles of thoroughly built roadways, over which the heaviest freighting is done.

The miner's inch in California previous to 1903 was an unfixed term varying in different localities to a discharge from 1½ to 1¾ cubic feet per minute. In that year the law was amended and a legal miner's inch now consists of that quantity of water which will flow through an opening of one square inch under a pressure of four inches above the opening. Each square inch of this opening represents a miner's inch and is equal to the flow of 1½ cubic feet of water (approximately 9 gallons) per minute.

The United States Geological Survey reports that a tin-bearing ledge has been located 15 miles east of a little settlement called York, situated in the western extremity of Seward Peninsula. The ledge occurs in a granite dike between limestone walls. The cassiterite, or tin oxide, is found disseminated through the rock in small particles. A group of claims has been located and steps have been taken to develop the property. York is at the mouth of Auikovik River on the northwestern coast of Alaska. It is 35 miles west of Teller and 90 miles from Nome.

Local men are developing the newly-discovered silver and cobalt deposits, near Haileybury, on the line of the Temiskaming Railway, the ore of which is piled up ready for shipment when spring opens.

A fire on February 19 damaged the smelting works of the Canadian Copper Co., at Copper Cliff, Ont., to the extent of \$150,000, and the staff of 1,100 men were temporarily thrown out of employment. The directors at Toronto, on February 22, made arrangements by which the company could secure the use of the Mond smelter at Victoria Mines until the works were rebuilt. The new works will be rebuilt on an enlarged scale.

An order-in-council has just been passed by the Dominion government rescinding the regulations for the disposal of hydraulic mining locations in Yukon territory, which were adopted in December, 1898, and frequently amended. Mining will henceforth be carried on under placer regulations. Leases granted under the regulations are not interfered with.

The town of Collingwood, Ont., is applying to the Ontario legislature for an act modifying its former agreement with the Cramp Steel Co. On consideration of a \$115,000 bonus the company undertook to erect smelting works and steel furnace, to be in operation July 1 next. The steel plant is ready, at a cost of \$400,000, but the company seeks to be relieved of putting up a smelter now, as it does not wish to be restricted as to time. The town is willing to relieve it of the obligation on condition of the bonus being reduced to \$60,000.

At the annual meeting of the National Portland Cement Co., Ltd., operating near Durham, in Grey county, Ont., the financial report showed a net loss of \$10,087 on the year's business. The liabilities are \$1,161,561 and the assets \$86,936 less. The total receipts were \$271,597.

IRON AND STEEL IN MEXICO.—In a report on Mexico recently issued by the Foreign Office, it is stated that though the working of iron in the Republic has not yet received the impulse that has been given to gold and silver mining, attention is now more generally called to the existence of iron in many of the States, especially in Durango, in which is situated the famous "Cerro del Mercado," said to be almost of solid iron. Iron foundries are being erected in several of the large towns, and Monterey has set the example by the erection of a large steel plant, with a working capital of \$10,000,000, for making steel rails, girders, bar iron, machinery, tool steel, pig-iron, etc., which was formally opened and the first steel was cast in June, 1903. The total value of the imports into Mexico of iron and steel, and the manufactures thereof, in 1902, amounted to \$9,033,965, as against \$7,667,965 in 1901.

GEOLOGIST FOR NEW ZEALAND.

THE New Zealand Government invite applications for the appointment of a Geologist, Salary £600, Passage provided. Selected Candidate must arrive in Colony by first August next. Applications, stating age, qualifications and number in family, to be sent to the Hon. The Minister of Mines, Wellington, New Zealand.

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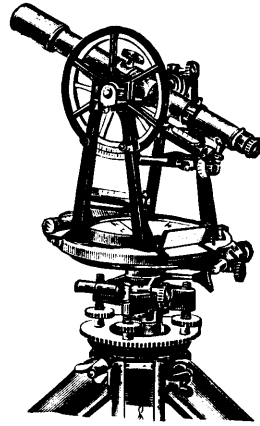
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- (A) To promote the Arts and Sciences connected with the economical production of valuable minerals and metals, by means of meetings for the reading and discussion of technical papers, and the subsequent distribution of such information as may be gained through the medium of publications.
- (B) The establishment of a central reference library and a headquarters for the purpose of this organisation.
- (C) To take concerted action upon such matters as effect the mining and metallurgical industries of the Dominion of Canada.
- (D) To encourage and promote these industries by all lawful and honourable means.

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MEMBERS shall be persons engaged in the direction and operation of mines and metallurgical works mining engineers, geologists, metallurgists, or chemists, and such other persons as the Council may see fit to elect.

STUDENT MEMBERS shall include persons who are qualifying themselves for the profession of mining or metallurgical engineering, students in pure and applied science in any technical school in the Dominion, and such other persons, up to the age of 25 years, who shall be engaged as apprentices or assistants in mining, metallurgical or geological work, or who may desire to participate in the benefits of the meetings, library and publications of the Institute. Student Members shall be eligible for election as Members after the age of 25 years.

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PUBLICATIONS.

Vol. I, 1898, 66 pp., out of print.
 Vol. II, 1899, 285 pp., bound red cloth.
 Vol. III, 1900, 270 pp., " "
 Vol. IV, 1901, 333 pp., " "
 Vol. V, 1902, 700 pp., " "
 Vol. VI, 1903, 600 pp., now in press.

Membership in the Canadian Mining Institute is open to everyone interested in promoting the profession and industry of mining without qualification or restrictions.

Forms of application for membership, and copies of the Journal of the Institute, etc., may be obtained upon application to

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**SALE OF VALUABLE MICA MINE
IN CANADA**

PURSUANT to the Order of the High Court of Justice, for the winding up of the Wakefield Mica Company, there will be offered for sale by public auction at the Local Master's Office, in the Court House, in the City of Ottawa, in the Dominion of Canada, on the

17th DAY OF MAY, 1904, at 2.30 P.M.

1. All the mines, minerals and mining rights in and upon Lot No. 16 in the 2nd Range of the Township of Wakefield in the County of Wright in the Province of Quebec, containing 200 acres, with the buildings erected thereon for mining purposes.
2. Water power and mill privilege on Blackburn's Creek on said Lot, containing one acre in fee simple, with saw-mill thereon erected, and electric dynamo and other machinery therein, including auxiliary steam plant.
3. All wood and timber on Lot No. 16 B in the 3rd Range of said Township, with free right to cut and remove same up to the 29th day of October, 1916.
4. A large quantity of mining plant and machinery, consisting of electric pump, motors, belting, shafting, derricks, drills, blacksmith's tools, rope, piping, telephones, stoves, cutlery &c.

The property is situate about six miles from Wakefield Station on the O.N. & W.Ry., and about 20 miles from the City of Hull. A shaft has been sunk to a depth of 170 feet and a considerable amount of mica has been extracted therefrom. Specimens of the mica and a detailed inventory of the chattels, a report of an independent Mining Engineer, and other information may be obtained from the Liquidator.

The entire property will be sold in one block, subject to a reserved bid fixed by the Master.

Ten per cent of the purchase money must be paid at the time of sale, and the balance within 30 days.

Dated the 21st day of January 1904.

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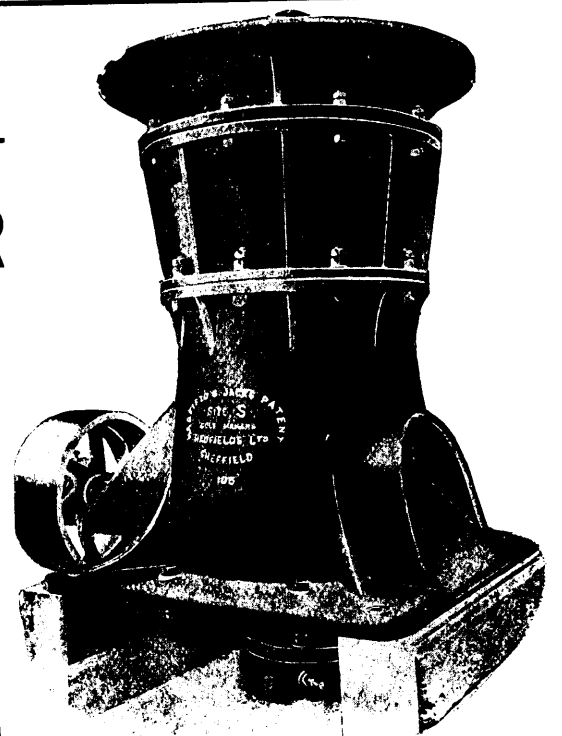
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JUDICIAL SALE

OF

GOLD MINING PROPERTY IN THE DISTRICT OF RAINY RIVER.

IN THE HIGH COURT OF JUSTICE

In the matter of The Winding Up Act, being Chapter 129 of The Revised Statutes of Canada and Amending Acts, and in the matter of The Decca-Chemical Consolidated Mining Company of Ontario, Limited.

TENDERS will be received by William Louis Scott, Esquire, Local Master of this Court at Ottawa, at his office in the Court House in the City of Ottawa, up till Twelve o'clock noon on

FRIDAY, the 13th day of MAY next, 1904,

for the following Gold mining properties owned and operated by the said The Decca-Chemical Consolidated Mining Company of Ontario, Limited, and situated in the District of Rainy River, and Province of Ontario, being:

- 1.—That Leasehold of Mining Location K 264 east of Bad Vermillion Lake, registered in the Land Titles Office at Rat Portage as parcel 191 in the Register for Leaseholds.
- 2.—That Leasehold of Mining Location 712 P situate on Bad Vermillion Lake, Seine River, registered in the said office as parce 577 in the Register for Leaseholds.
- 3.—That Freehold property, Mining Locations S 294 containing 50 acres situate north of the east end of Witch Bay on the east side of Lake of the Woods and J. O. 113 containing 23 acres situate west of and adjoining S 294 above described, registered in the said office as Freehold parcel 2159, north division.
- 4.—That Freehold property, Mining Location J. O. 133 situate north east of Witch Bay of the Lake of the Woods, registered in the said office as Freehold parcel 2337, north division.
- 5.—That Freehold property Mining Location K 222, containing forty acres situate north of Shoal Lake, Seine River, in the District of Rainy River, as shown on Plan of Survey made by O.L.S. James McCallum, dated the 28th day of August 1894 of record in the Department of Crown Lands.

TENDERS must be sealed and addressed "W. L. Scott, Esquire, Local Master, Court House, Ottawa," and marked "Re Decca-Chemical Consolidated Mining Company of Ontario, Limited, Tender for Property," and each tender must be accompanied by a certified cheque payable to A. P. Mutchmor, Liquidator The Decca-Chemical Consolidated Mining Company of Ontario, Limited, for not less than ten per cent. of the amount of such tender. Such cheque will be returned in the event of the tender not being accepted. Upon the acceptance of any tender the balance of the purchase money shall be paid to the said A. P. Mutchmor within fifteen days thereafter, and the purchaser shall thereupon be entitled to a transfer of the property. In the event of the Purchaser failing to pay the said balance of the purchase money the deposit of ten per cent. above mentioned shall be forfeited and the property may be re-sold, and any deficiency therein shall be made good by the defaulter.

The purchaser shall prepare the transfer of the property at his own expense and will tender the same for execution and all expenses incidental to the investigation of Title and the registration of the Transfer shall be borne by the purchaser.

The property will be sold subject to the rents, taxes, encumbrances or dues of any sort whatsoever owing to the Government or to any person or corporation whatsoever, which are said to amount to about \$60.00.

The highest or any tender will not necessarily be accepted.

Further particulars may be had from Messrs Murphy & Fisher, Barristers, Ottawa.

Dated at Ottawa this 25th day of February, A.D. 1904.

MURPHY & FISHER,
 19 Elgin St., Ottawa,

Solicitors for Liquidator.

W. L. SCOTT,

Master at Ottawa.



Dominion of Canada

SYNOPSIS OF REGULATIONS

For disposal of Minerals on Dominion Lands in Manitoba, the North-west Territories and the Yukon Territory.

COAL.

Coal lands may be purchased at \$10 per acre for soft coal and \$20 for anthracite. Not more than 320 acres can be acquired by one individual or company. Royalty at the rate of ten cents per ton of 2,000 pounds shall be collected on the gross output.

QUARTZ.

Persons of eighteen years and over and joint stock companies holding free miner's certificates may obtain entry for a mining location.

A free miner's certificate is granted for one or more years, not exceeding five, upon payment in advance of \$7 50 per annum for an individual, and from \$50 to \$100 per annum for a company, according to capital.

A free miner, having discovered mineral in place, may locate a claim 1500 x 1500 feet by marking out the same with two legal posts, bearing location notices, one at each end on the line of the lode or vein.

The claim shall be recorded within fifteen days if located within ten miles of a mining recorder's office, one additional day allowed for every additional ten miles or fraction. The fee for recording a claim is \$5.

At least \$100 must be expended on the claim each year or paid to the mining recorder in lieu thereof. When \$500 has been expended or paid, the locator may, upon having a survey made, and upon complying with other requirements, purchase the land at \$1.00 an acre.

Permission may be granted by the Minister of the Interior to locate claims containing iron and mica, also copper, in the Yukon Territory, of an area not exceeding 160 acres.

The patent for a mining location shall provide for the payment of a Royalty of 2½ per cent. of the sales of the products of the location.

PLACER MINING.

Manitoba and the N. W. T., excepting the Yukon Territory.—Placer mining claims generally are 100 feet square; entry fee, \$5, renewable yearly. On the North Saskatchewan River claims are either bar or bench, the former being 100 feet long and extending between high and low water mark. The latter includes bar diggings, but extends back to the base of the hill or bank but not exceeding 1,000 feet. Where steam power is used, claims 200 feet wide may be obtained.

Dredging in the rivers of Manitoba and the N. W. T., excepting the Yukon Territory.—A free miner may obtain only two leases of five miles each for a term of twenty years, renewable in the discretion of the Minister of the Interior.

The lessee's right is confined to the submerged bed or bars of the river below low water mark, and subject to the rights of all persons who have, or who may receive entries for bar diggings or bench claims, except on the Saskatchewan River, where the lessee may dredge to high water mark on each alternate leasehold.

The lessee shall have a dredge in operation within one season from the date of the lease for each five miles, but where a person or company has obtained more than one lease one dredge for each fifteen miles or fraction is sufficient. Rental, \$10 per annum for each mile of river leased. Royalty at the rate of two and a half per cent collected on the output after it exceeds \$10,000.

DREDGING IN THE YUKON TERRITORY.

Six leases of five miles each may be granted to a free miner for a term of twenty years, also renewable.

The lessee's right is confined to the submerged bed or bars in the river below low water mark, that boundary to be fixed by its position on the 1st day of August in the year of the date of the lease.

The lessee shall have one dredge in operation within two years from the date of the lease, and one dredge for each five miles within six years from such date. Rental, \$100 per mile for first year and \$10 per mile for each subsequent year. Royalty, same as placer mining.

PLACER MINING IN THE YUKON TERRITORY.

Creek, gulch, river and hill claims shall not exceed 250 feet in length, measured on the base line or general direction of the creek or gulch, the width being from 1,000 to 2,000 feet. All other placer claims shall be 250 feet square.

Claims are marked by two legal posts, one at each end, bearing notices. Entry must be obtained within ten days, if the claim is within ten miles of mining recorder's office. One extra day allowed for each additional ten miles or fraction.

The person or company staking a claim must hold a free miner's certificate. The discoverer of a new mine is entitled to a claim of 1,000 feet in length, and if the party consists of two, 1500 feet altogether, on the output of which no royalty shall be charged, the rest of the party ordinary claims only.

Entry fee, \$10. Royalty at the rate of two and one half per cent on the value of the gold shipped from the Yukon Territory to be paid to the Comptroller.

No free miner shall receive a grant of more than one mining claim on each separate river, creek or gulch, but the same miner may hold any number of claims by purchase, and free miners may work their claims in partnership by filing notice and paying fee of \$2. A claim may be abandoned, and another obtained on the same creek, gulch or river, by giving notice and paying a fee.

Work must be done on a claim each year to the value of at least \$200. A certificate that work has been done must be obtained each year: if not, the claim shall be deemed to be abandoned, and open to occupation and entry by a free miner.

The boundaries of a claim may be defined absolutely by having a survey made and publishing notices in the Yukon Official Gazette.

PETROLEUM.

All unappropriated Dominion Lands in Manitoba, the North west Territories and within the Yukon Territory are open to prospecting for petroleum, and the Minister may reserve for an individual or company having machinery on the land to be prospected, an area of 640 acres. Should the prospector discover oil in paying quantities, and satisfactorily establish such discovery, an area not exceeding 640 acres, including the oil well and such other land as may be determined, will be sold to the discoverer at the rate of \$1.00 an acre, subject to royalty at such rate as may be specified by order-in-council.

JAMES A. SMART,
Deputy of the Minister of the Interior.

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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 or 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 MINISTER OF LANDS, MINES AND FISHERIES,
PARLIAMENT BUILDINGS, QUEBEC, P. Q.

Ontario's Mining Lands..

THE Crown domain of the Province of Ontario contains an area of over 100,000,000 acres, a large part of which is comprised in geological formations known to carry valuable minerals and extending northward from the great lakes and westward from the Ottawa river to the Manitoba boundary.

Iron in large bodies of magnetite and hematite ; copper in sulphide and native form ; gold, mostly in free milling quartz ; silver, native and sulphides ; zincblende, galena, pyrites, mica, graphite, talc, marl, brick clay, building stones of all kinds and other useful minerals have been found in many places, and are being worked at the present time.

In the famous Sudbury region Ontario possesses one of the two sources of the world's supply of nickel, and the known deposits of this metal are very large. Recent discoveries of corundum in Eastern Ontario are believed to be the most extensive in existence.

The output of iron, copper and nickel in 1900 was much beyond that of any previous year, and large developments in these industries are now going on.

In the older parts of the Province salt, petroleum and natural gas are important products.

The mining laws of Ontario are liberal, and the prices of mineral lands low. Title by freehold or lease, on working conditions for seven years. There are no royalties.

The climate is unsurpassed, wood and water are plentiful, and in the summer season the prospector can go almost anywhere in a canoe. The Canadian Pacific Railway runs through the entire mineral belt.

For reports of the Bureau of Mines, maps, mining laws, etc, apply to

HONORABLE E. J. DAVIS,

Commissioner of Crown Lands,

or

THOS. W. GIBSON,

Director Bureau of Mines,

Toronto, Ontario.



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.

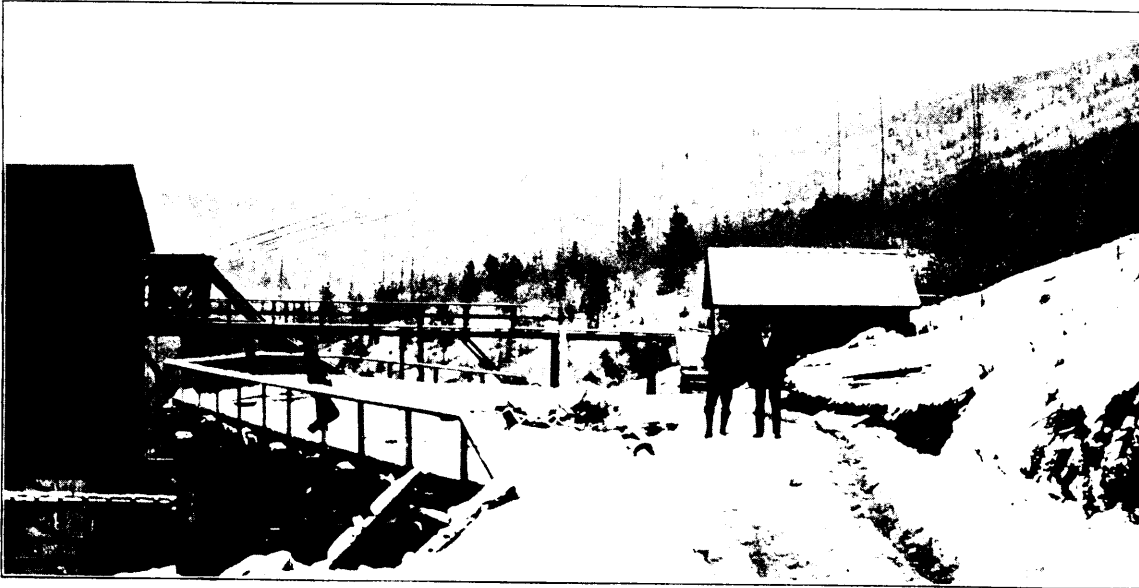
The royalties on the remaining minerals are: Copper, four cents on every unit; Lead, two cents upon every unit; Iron, five cents on every ton; Tin and Precious Stones, five per cent.; Coal, 10 cents on every ton sold.

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. A. DRYSDALE,
Commissioner Public Works and Mines,
HALIFAX, NOVA SCOTIA.

One Man Can handle 1600 TONS per day with a Riblet Patent Automatic Aerial Tramway



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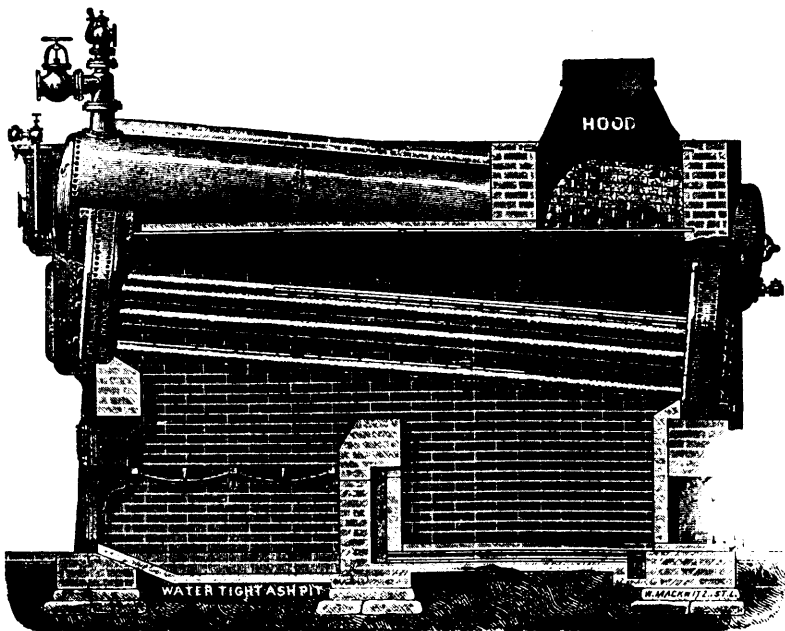
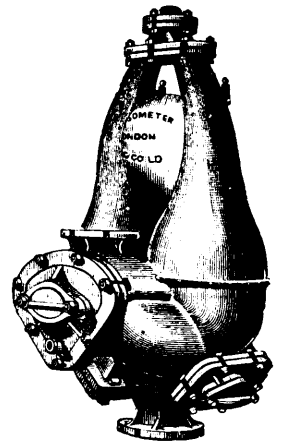
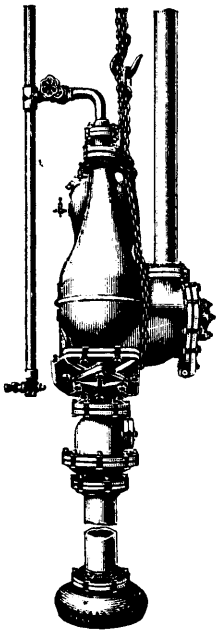
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Wire specially selected for own exclusive use.
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Illustration of Winding Rope, 240 fms. long x 3 1/2 circ. Galvanized Special Improved Patent Steel, Compound Make, supplied



to Kenneil Collieries Bo'ness, Scot., which gave a record life of 6 years and 2 months. Shewing condition when taken off.

TELEGRAMS—"Ropery Rutherglen." A B C, A I and Lieber's Codes used.

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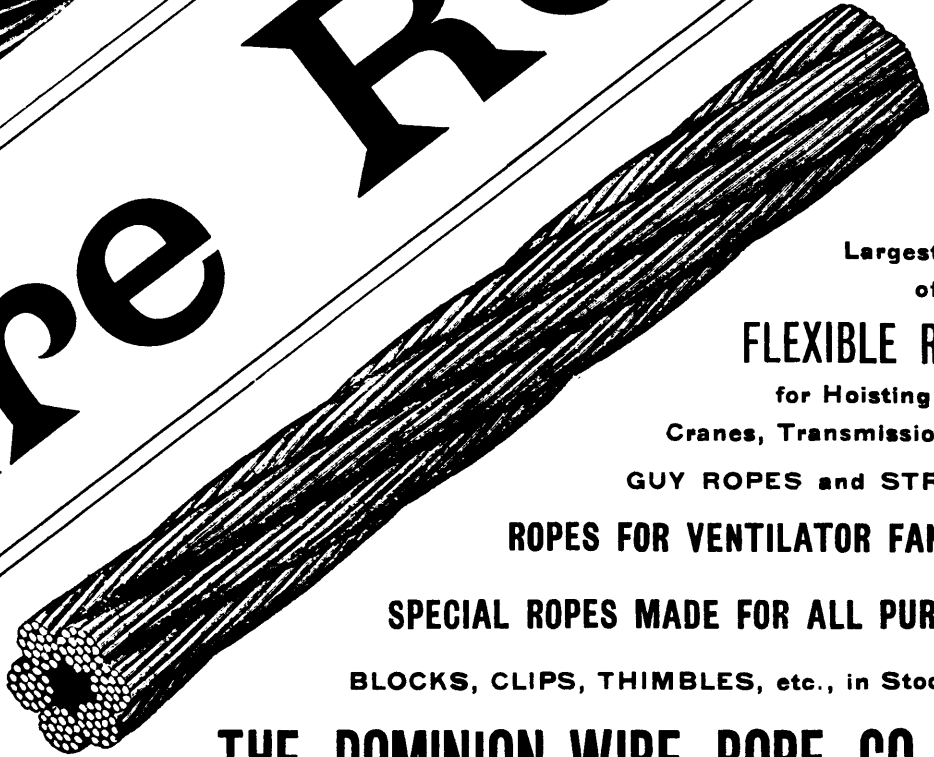
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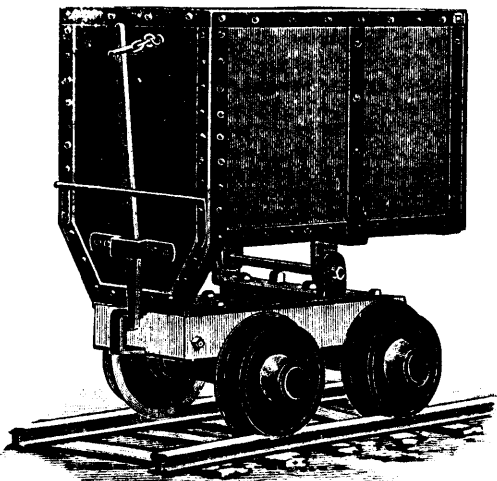
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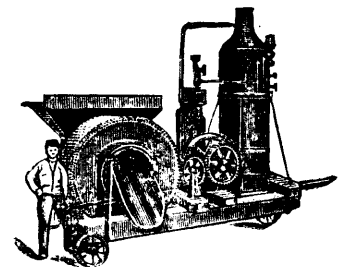
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