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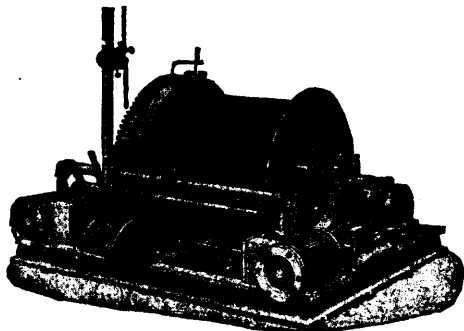
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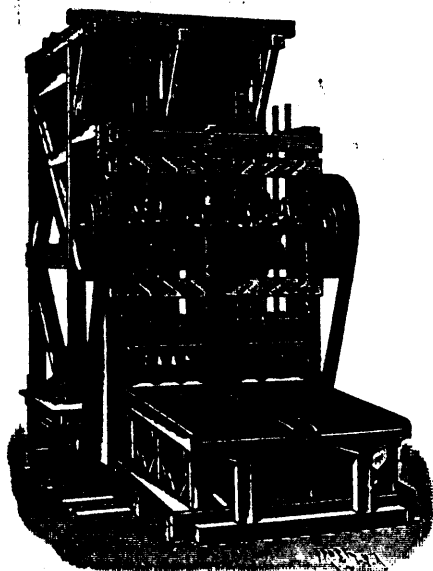
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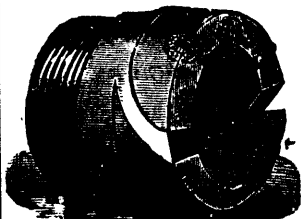
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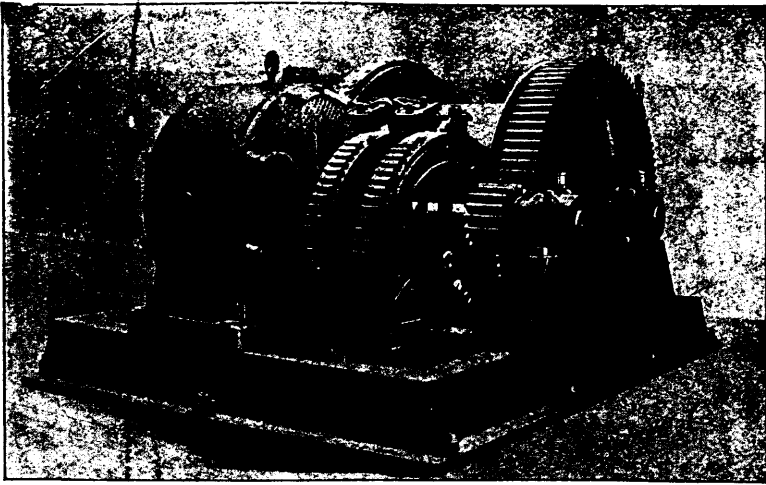
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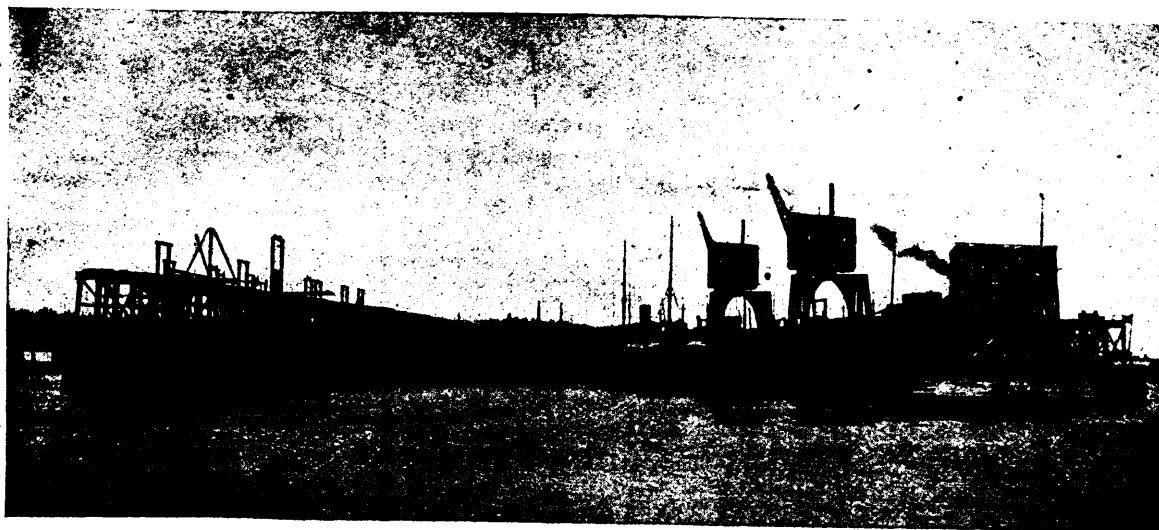
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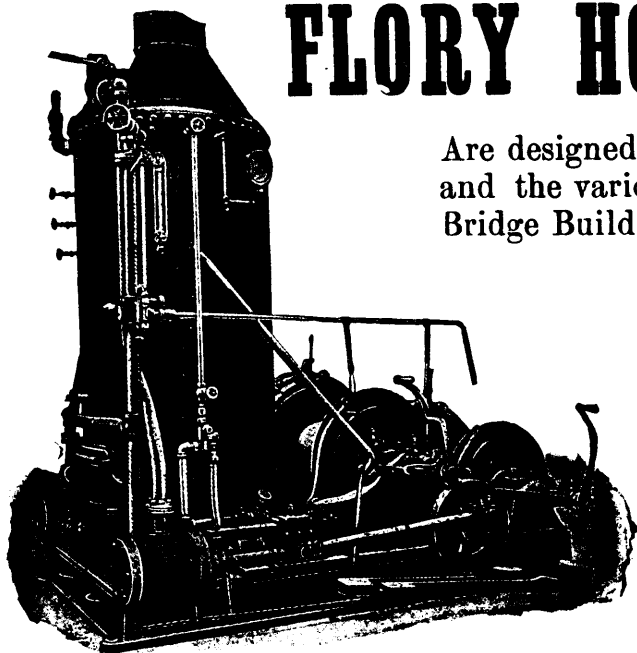
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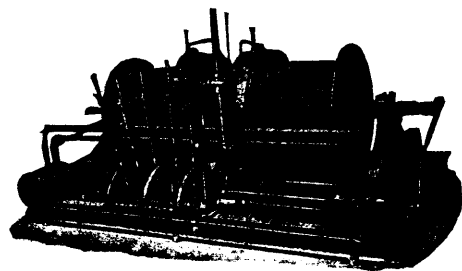
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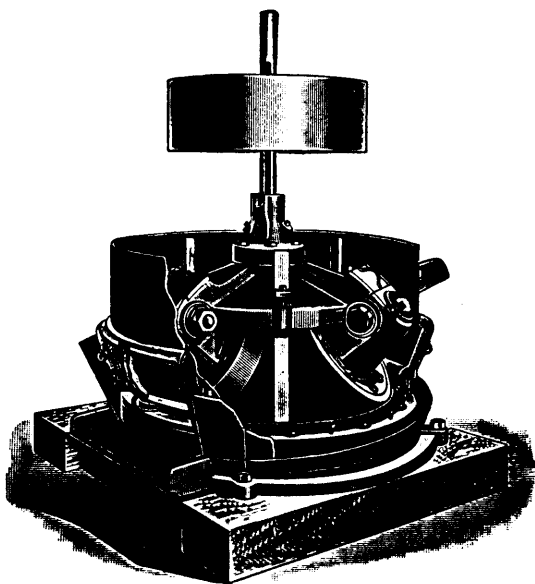


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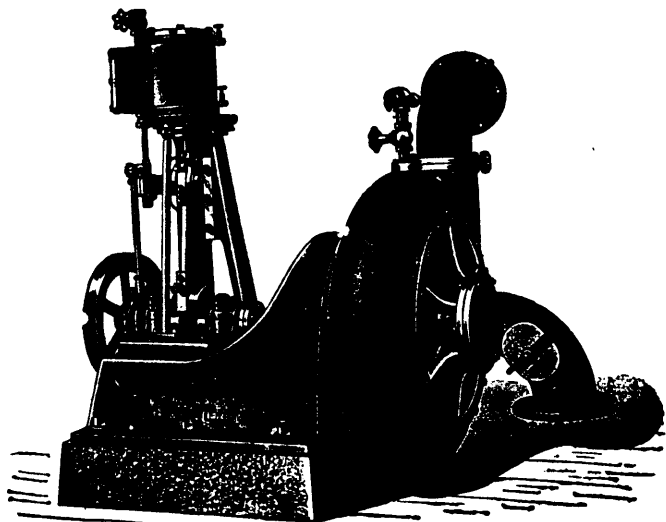
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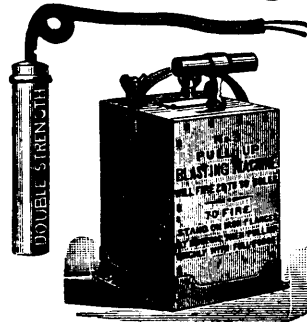
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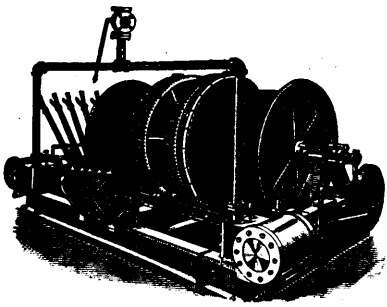
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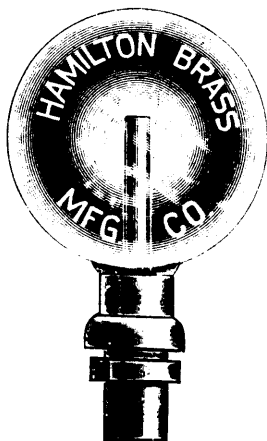
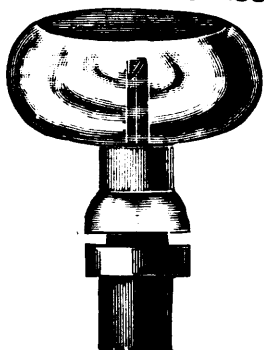
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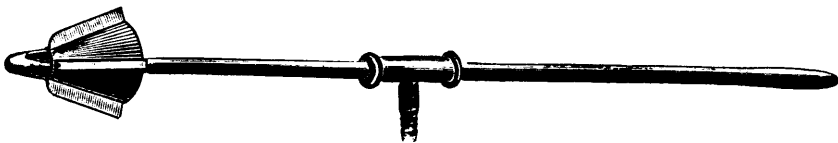
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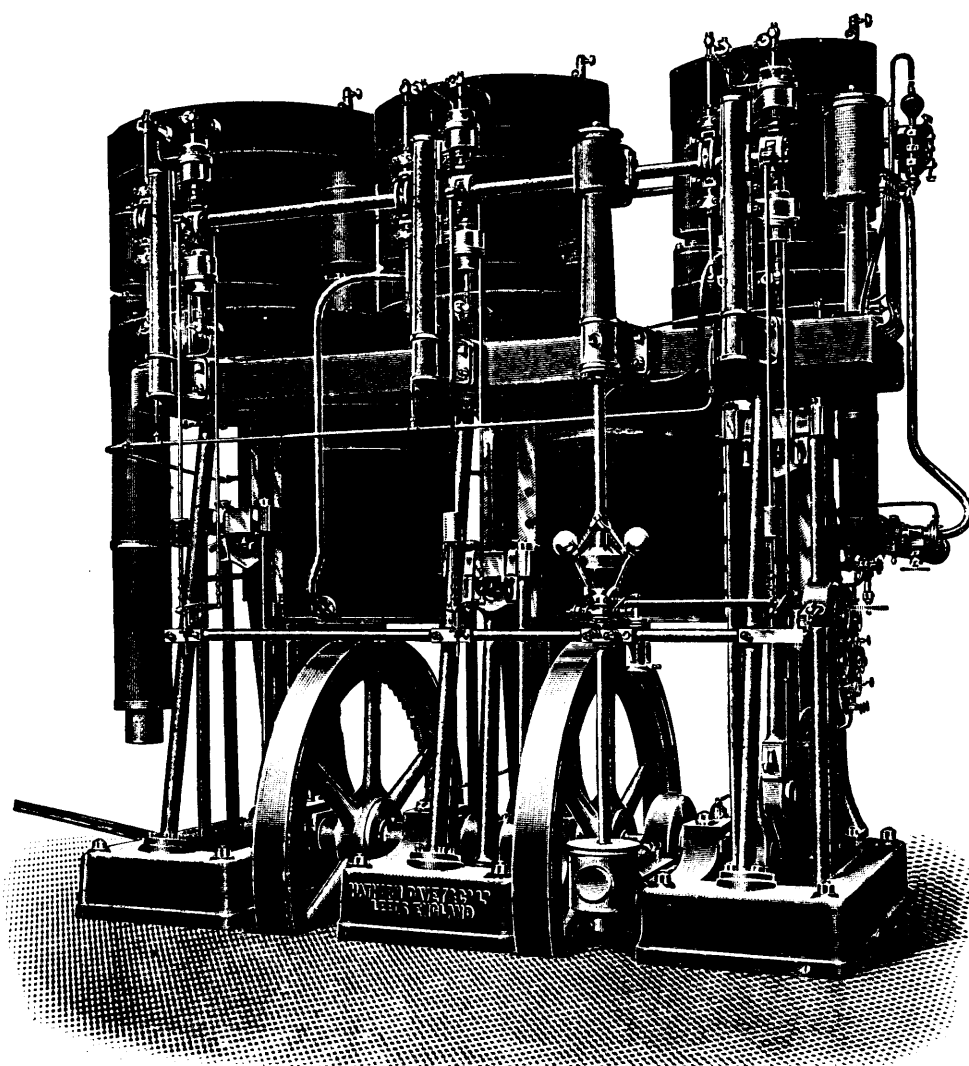
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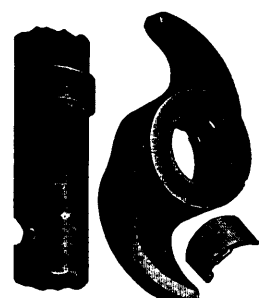
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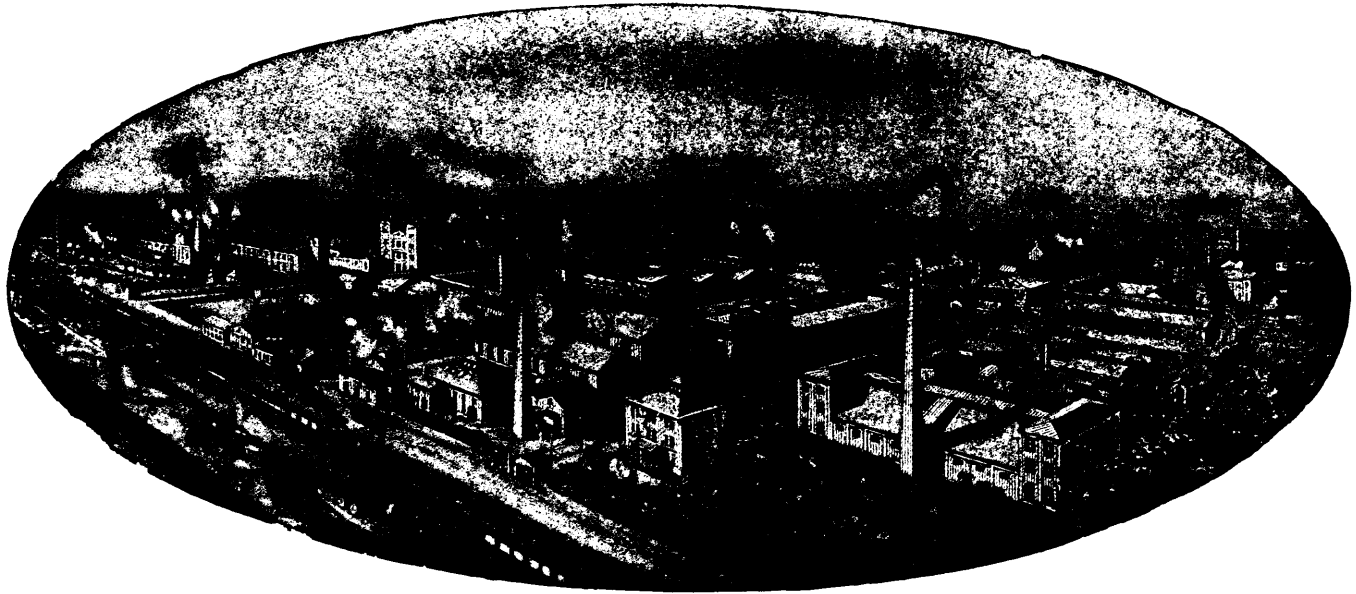
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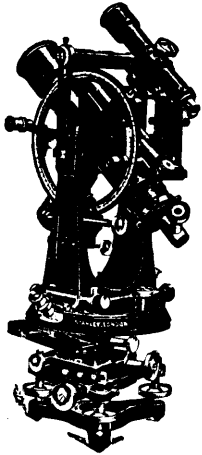
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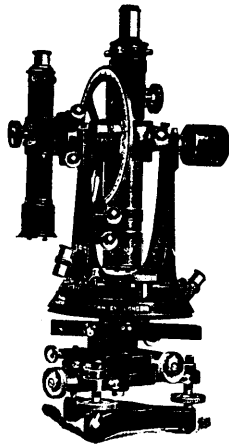
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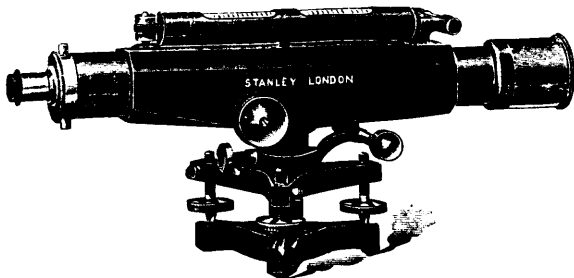
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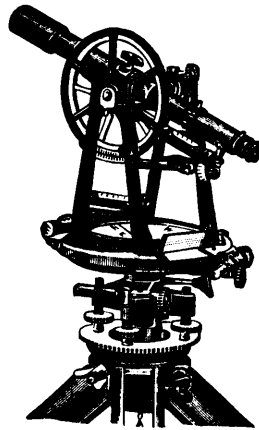
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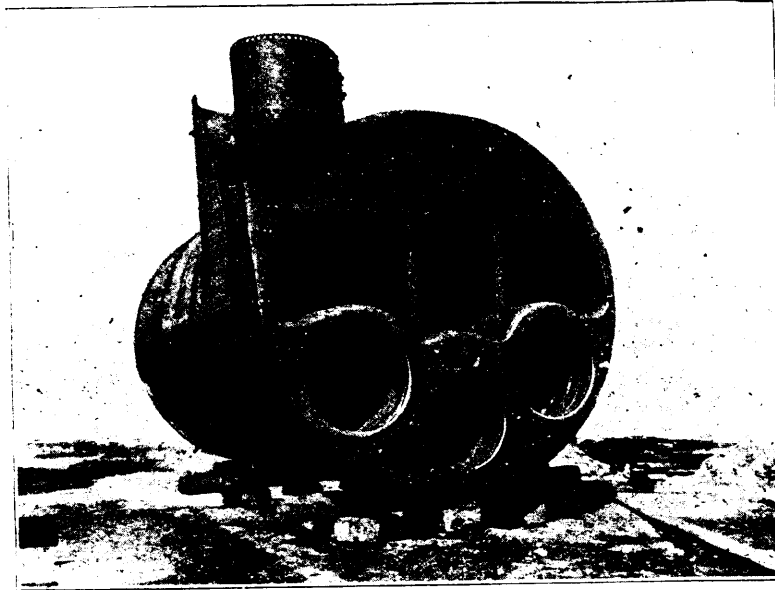
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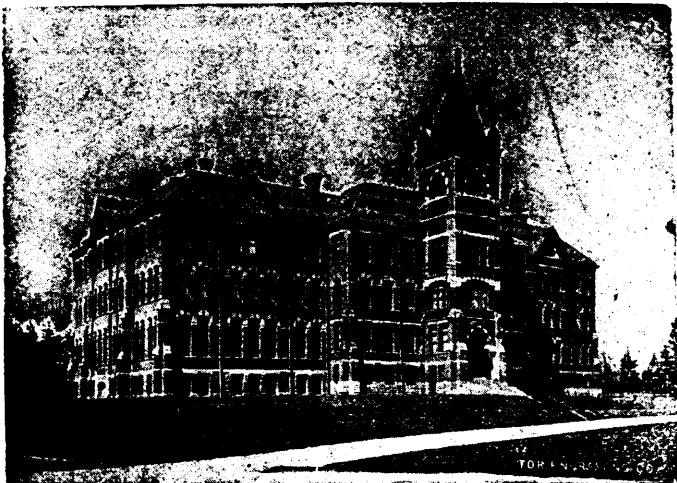
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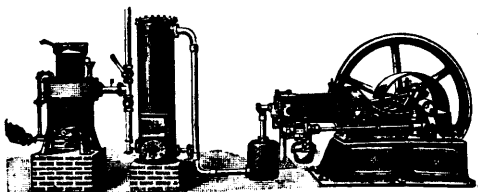
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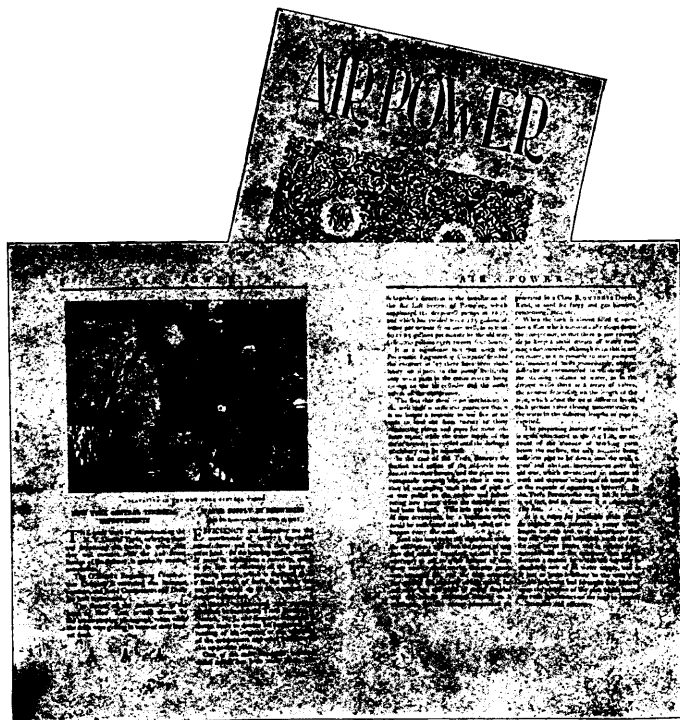
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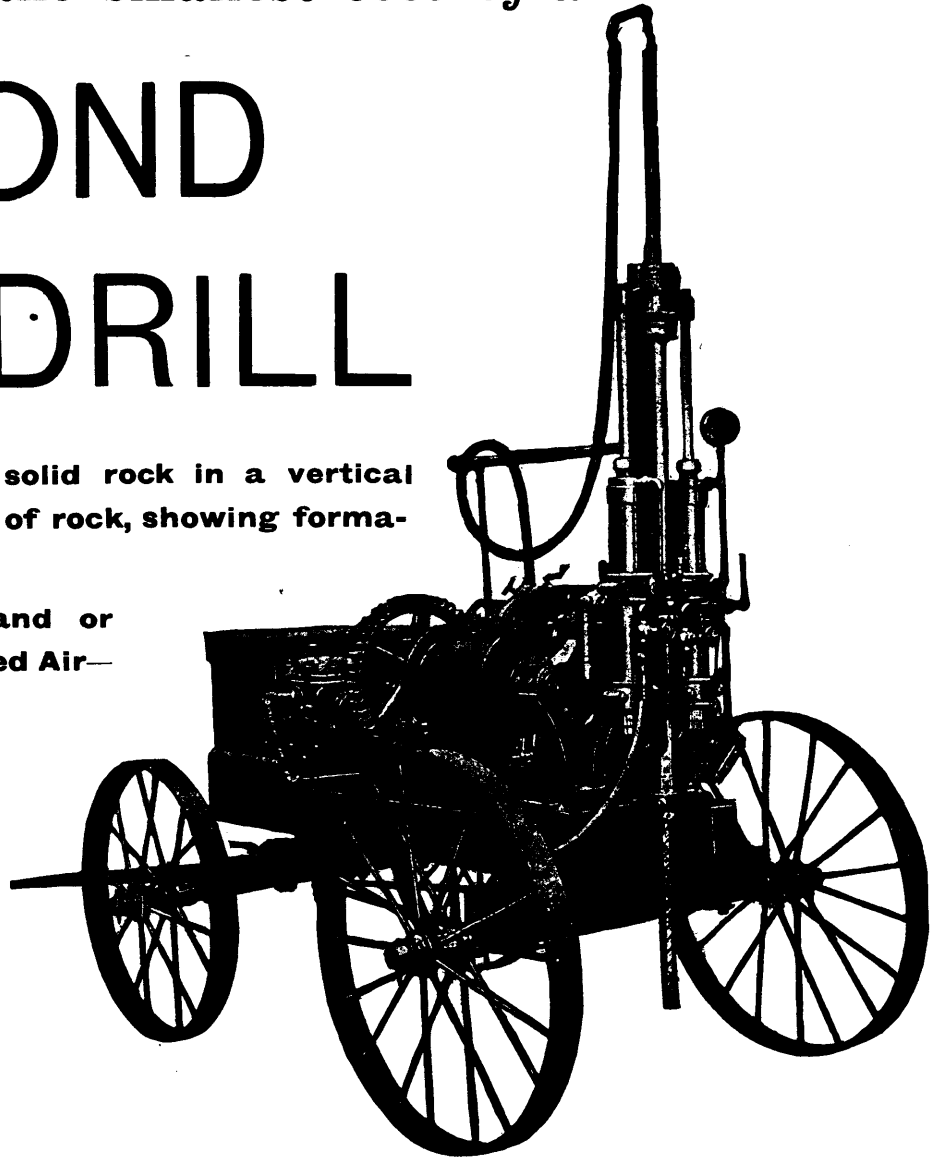
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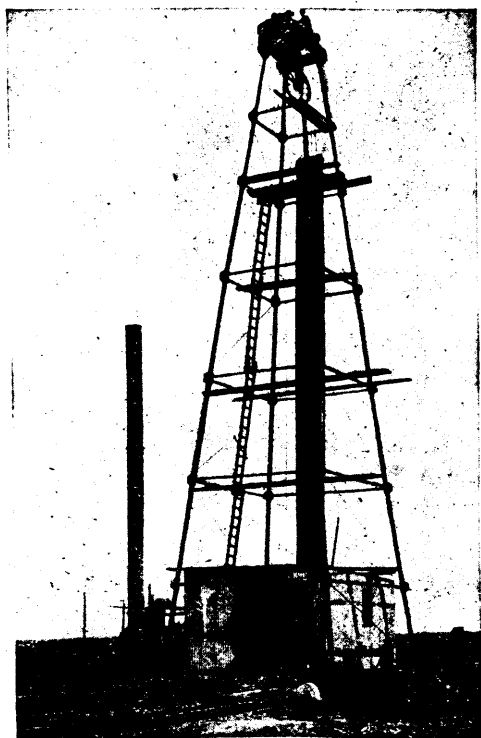
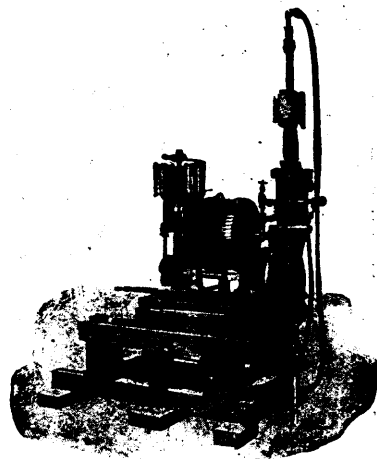
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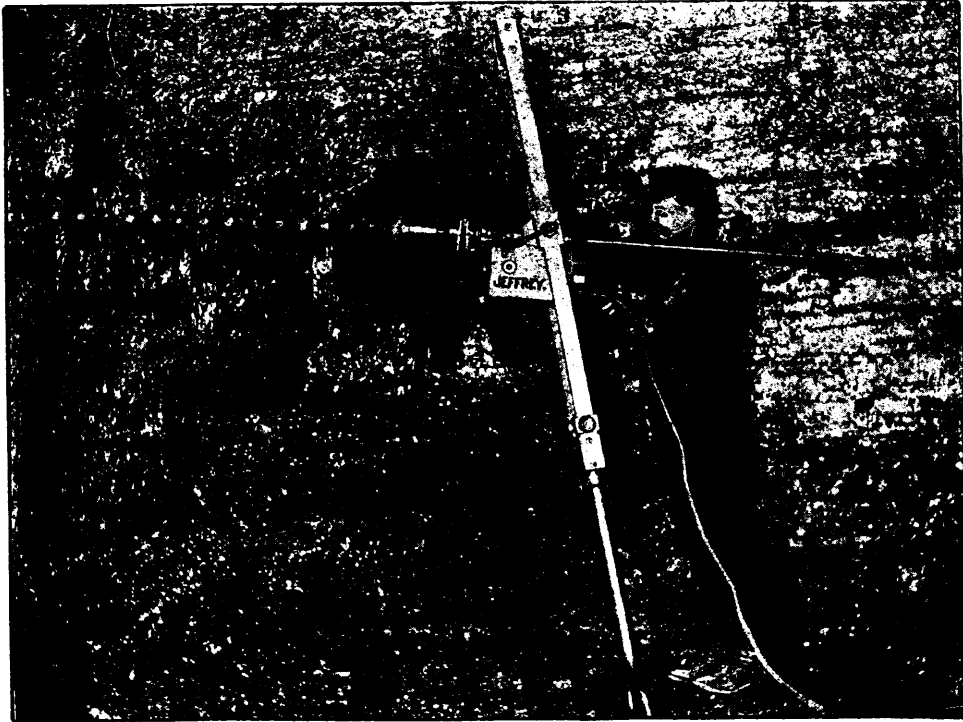
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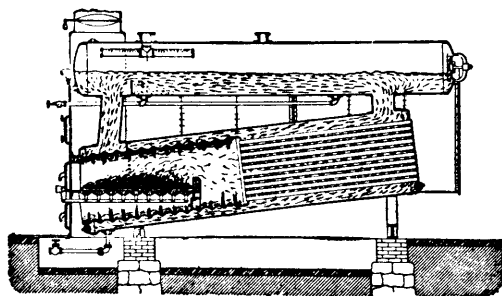
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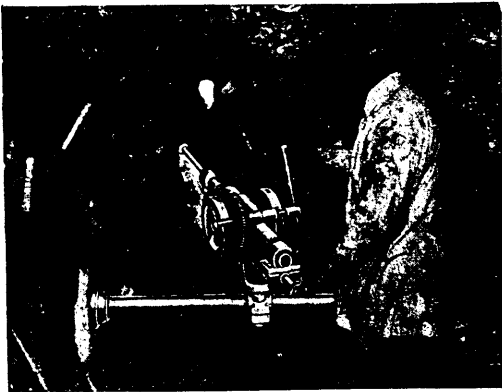
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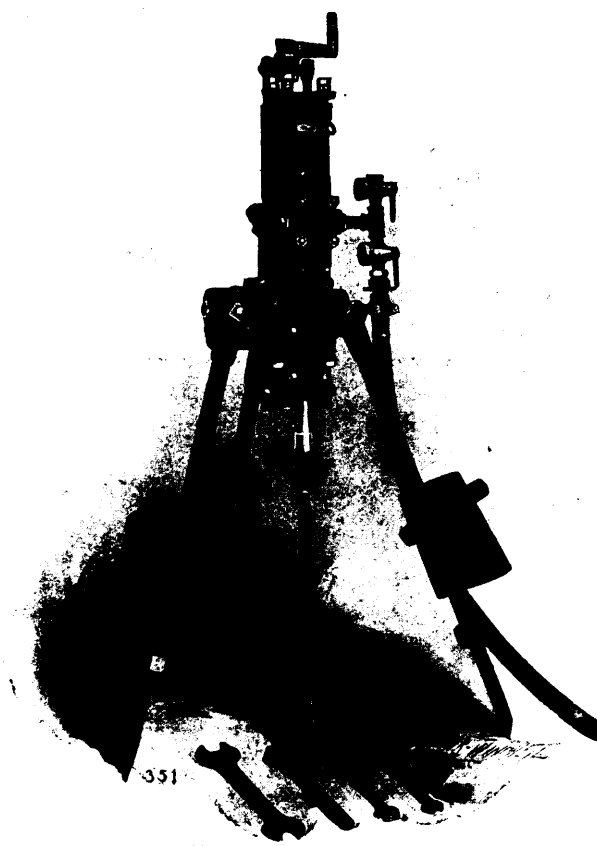
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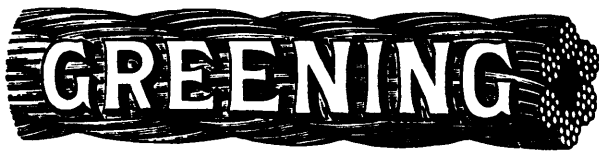
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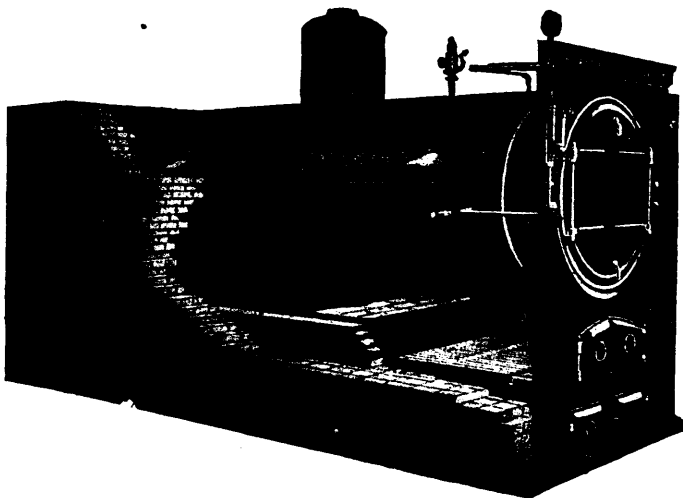
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PUBLISHED MONTHLY.

157 St. James Street, Montreal

VOL. XXIV—No. 3.

MONTREAL, MARCH, 1905.

\$3.00 per year.
25 cents per copy.

Address all communications to The REVIEW PUBLISHING COMPANY, Limited, P. O. Box 2187, Montreal, Canada.

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The annual report of the Dominion Coal Company, of which a summary is given on one of our pages, alludes to the reimposition of the duty of coal going into the United States. The subject of taxing coal which is imported as well as of imposing a tax for the benefit of the commonwealth in which the coal is mined, has been engaging the attention of many minds, not only in Canada, but in the United States, and particularly in the State of Pennsylvania, where Governor Pennypacker has suggested the imposition of a tax for the benefit of road improvements and school funds; Governor Pennypacker is associated in his ideas with Governor White of West Virginia.

In the meantime, Nova Scotia is saying a good deal in the papers respecting the movement initiated in Ontario which asks for the abolition of the import duty on American coal. Among our news notes this month is an item stating that the Dominion Coal Company has determined to secure the Ontario markets for its own product. With all this flashing of battle axes by divergent interests, the real gist of the matter is obscured, rather than aided.

Up to the moment of writing, no additional authoritative information is available regarding the Rossland merger to which frequent allusion has been made in our columns. The REVIEW is given to understand from Toronto, that the hin-

drance to the programme comes from the divergent views of Mr. Waterlow and Mr. Blackstock regarding the situation of the head office of the combination. Naturally, Mr. Waterlow and associates desire the head office in London, equally naturally, Mr. Blackstock is reported as insisting that the head office shall be on this side of the water, and available for quick communication with the mining properties. We are distinctly of Mr. Blackstock's opinion, having always believed that the executive offices of a mine should be situated as closely as possible to the property itself.

Another rumor concerning the LeRoi consolidation emanates from the "Phoenix Pioneer," which is authority for the statement that the management of the proposed combination will be put in the hands of Mr. W. H. Aldridge, who at present occupies the position of general manager of the Canadian Pacific Railway's mining department. Mr. Aldridge is understood to be quite content with the position which he now occupies, and it is reported that he is ignorant of negotiations looking to his assuming the management of the consolidation.

It is reported that the effects of drying the blast before using it in blast furnaces, on the plan of Mr. James Gayley, of the United States Steel Co., are remarkable for both increased output of iron and decreased amounts of fuel. The burden of one furnace at Pittsburg has been increased from 2,516 tons per week to 3,129 tons, an increase of 620 tons, and the full burden has decreased from 2,147 tons to 1,726 tons; or, the fuel consumption per ton of ore was reduced from .85 ton to .55 ton. This saving of 3-10 of a ton of coke per ton of ore, with coke at \$5.00 per ton, means a large saving, in this case nearly \$4,700 a day.

The statement of the approximate valuation of the mineral production of British Columbia for 1904 shows an increase (over that for 1903) of all minerals, except copper. The largest metallic increase must be credited to lead, which shows about \$800,000 advance over 1903. This is primarily due to assistance received from the Dominion Government in the shape of a bounty but is also somewhat due to appreciation in the market price of the metal.

The value to a commonwealth at large of such institutions as the Canadian Mining Institute is occasionally demonstrated, and the REVIEW is glad to be able to chronicle a recent instance. In March, 1904, Mr. E. B. Kirby contributed a most valuable article on the ore deposits of Rossland, which was first published in the columns of the REVIEW, and afterwards incorporated in the Journal of the Mining Institute. Now, the Rossland Board of Trade has ordered the paper to be reprinted in pamphlet form, and has arranged for the gratuitous distribution of 1,000 copies. Probably no other brochure would have had as much effect in attracting the best class of attention to the peculiarities of the Rossland district as did this paper from the pen of one who has spent five years in the study and active management of two of the largest mines in the district.

Apropos of the discussion of the two per cent. mineral tax, which has been prevalent during the last two months in British Columbia, the REVIEW notes the resolution which was adopted by the Associated Silver Lead Mines at its recent meeting. Considerable discussion was evoked, but the resolution contains the following words:—"Resolved, that this Association approves of the principle of taxing the output of metalliferous mines.

"If it is deemed necessary to revise the present method of such taxation, it would advise that, before any change is made, a commission representative of the various branches of the metalliferous mining industry be appointed; such commission to have power to summon witnesses and examine mine and smelter books with a view to arriving at an equitable basis of taxation, the expense of such commission to be borne by the Government.

"Further resolved, that, if such commission shall find it advisable to amend the present method of taxing a smelter or mill return, this Association suggests taxing it on a rate to be fixed on the gross recovered value of the ore."

As against this, we note that a still more recent meeting of the Nelson branch of the Provincial Mining Association unanimously was in favor of a resolution to the effect that the tax on mines in operation should be solely upon the profits earned; and suggested that, in order to arrive at an equitable method of obtaining net profits, it be recommended that the deduction of the mine pay roll from the net smelter returns be considered, and, at the same time the resolution went on to acknowledge that the suggestion was a compromise for expediency. These two meetings of prominent and important associations of mine owners offer, we think, views in distinct opposition to each other. The REVIEW is glad to note that the Associated Silver Lead Mines have recognized the advantages of getting at net values, by the last paragraph of their resolution, in which is embodied the suggestion that the tax should be upon the gross recovered value of the ore. This is, in effect, what the REVIEW said in its comments on the letter of its esteemed correspondent in its February issue.

"The exhaustion of the known and payable mineral riches of South Africa must be a matter of many generations; and the greatest experts regard the already discovered resources of the region as but the fringe of what is to come. The probabilities are on the side of an almost indefinite extension of the gold industry; and South Africa is full of all sorts of other valuable deposits besides—coal, copper and oil among them. To talk of the day when there shall be no more mines in South Africa is as foolish as to prate of the time when there may be no British Empire."—The Critic.

Seventh Annual Meeting of the Canadian Mining Institute.

Held at Montreal, March 1st, 2nd and 3rd, 1905.

The seventh annual meeting of the Canadian Mining Institute opened its sessions with a business meeting at 10.30 a.m. on the morning of the first of March, President Coste in the chair.

The president welcomed the members to the meeting, and then presented the annual reports of the Council and of the treasurer, which he proceeded to read. The report of the Council showed that, although there had been a slight decrease in the number of regular members, there had been a large increase of students and affiliated members, and that the total membership of the Institute now amounted to about 480.

Three deaths of members had occurred during the year, namely, the late secretary, Mr. B. T. A. Bell, Mr. Cornelius Shields of the Lake Superior Company, and Mr. J. R. Gifford, formerly of British Columbia. In respect of all of whom the Council spoke in appreciative terms.

After the reports had been accepted by the meeting, the appointment of scrutineers for the election of Officers was asked for, and Prof. W. G. Miller, of Toronto; Commander A. P. Low, of Ottawa; and Mr. A. W. Stevenson, of Montreal, were appointed.

Mr. Geo. E. Drummond then rose to move a resolution, which, in effect, instructed the scrutineers to count both the green and the yellow ballots which had been in the field, and concerning which many circular letters had been sent to the members. The motion also declared in favor of recording votes from members who had written letters declaring that certain ballots had been voted by them, which ballots might or might not have been among the fifty-two ballots which were acknowledged by the president to have been destroyed. This motion was admirably put and spoken to by Mr. Drummond, was seconded by Dr. W. L. Goodwin, and had the immediate effect of reconciling diverse interests, and was unanimously agreed to.

Mr. E. D. Ingall, Statistician of the Geological Survey, asked permission of the president to call the attention of the members to the statement of the annual mineral production for the year 1904, which had been printed, and copies of which had been placed on the table for distribution among the members.

A number of invitations, to make use of the hospitalities of the Engineers' Club, the Canadian Society of Civil Engineers' rooms, to visit the Allis-Chalmers-Bullock's works, were read by the president, and thanks were given by the meeting to the corporations extending these courteous invitations.

After a few other unimportant items of business, the meeting adjourned until three o'clock in the afternoon.

The afternoon session opened at 3 p.m. with a statement from the president that, owing to the multitude of papers with which his luggage had been burdened, his annual address had been mislaid, and was, therefore, unavailable for the afternoon session, but he promised it for the evening session; and the first paper of the session, on "The Goldfield District, Nevada," by Mr. E. P. Jennings, of Salt Lake City, was then read. This paper dealt with the new district, which is some twenty-five miles to the south of the famous Tonapah District, and which has already shipped over \$2,000,000 worth of ore, the value of which has averaged between two and three thousand dollars to the ton. Mr. John E. Hardman drew the members' attention to the fact that the first production in Goldfields had been made by a man formerly identified with the mining industry in British Columbia, Mr. L. L. Patrick, and also that the recently deceased member, Mr. John R. Gifford, had gone into the Goldfields District last fall, and, in working the properties which he had acquired, had caught that chill which resulted in his death shortly afterwards at his home in Haywood, Cal.

Mr. John Blue drew the attention of the members to some facts that had been communicated to him by an engineer resident in the district for some time, to the effect that the gold of the district was not found in the quartz veins, but was found in very considerable quantities in the rhyolite walls.

Mr. Hardman remarked that, in one of the letters received from Mr. Gifford, some occurrence had been noted that in taking down a piece of shaking hanging wall rock a rich deposit of metallic gold had been uncovered, from which a very considerable value was obtained.

Mr. Hardman also drew attention to the fact that Mr. Jennings had not mentioned in his paper the occurrence of any telluride ores in the section; that the speaker was advised, through correspondence, that a small amount of tellurium mineral had been found there, and that in consequence an analogy, whether correctly or not he did not know, had been drawn between the ores of Cripple Creek and those of Goldfields. The fact was merely mentioned as contributing, in a very small way, perhaps, to the information contained in Mr. Jennings' paper.

The second paper of the afternoon session was on the "Bedrock of the Gilbert River Gold Fields, P. Q.," by Mr. John A. Dresser, of St. Henry. In this paper, Prof. Dresser made a demonstration that the source of the gold deposits of the Chaudiere Basin and of the gold fields in the southeastern portion of the Province of Quebec were intimately connected with the eruptives, and constituted the underlying rock of the regions. Thus it had been found that the deposits of the Chaudiere Basin, of the Gilbert River, and the Famine and Desplantes Rivers were intimately connected with the underlying eruptives. The paper was discussed briefly, and the thanks of the members were given to Mr. Dresser for his contribution to the literature of the gold fields of Quebec.

A paper on the "Need of a Provincial Museum in Ontario," by Dr. W. A. Parks, followed. In the absence of the author, the paper was read by the president. Dr. Parks referred to the large sum of money which had been expended in making known to the world, through the St. Louis Exposition and foreign expositions, the natural products of Canada, and the extensive displays which had been made not only of the metallic wealth of the Dominion but of all its natural products, and asking the pertinent question: Why should not the same attention be directed to permanent exhibits of the same kind? He showed the stimulus to investigation which such exhibits gave, and the value of a collection representing the natural

resources of the country, and instanced many cases of the utility of these collections to mining men and manufacturers. The need of such museums for each province was referred to, and the praiseworthy examples of museums in different States to the south of us and in the different kingdoms in Europe, were mentioned. Dr. Parks maintained that nothing could be of more value, both to the geologist and the mining engineer, than the creation of such museums, and said he believed that it was high time the example of other and more progressive countries was followed.

Papers on the "Bornite Ores of the Pacific Coast in British Columbia and the Yukon," by Mr. W. M. Brewer, of Victoria, B.C., and on "Varieties of Serpentine in Southeastern Quebec," by Mr. John A. Dresser, were also read, and briefly discussed. By vote of the members it was decided that, instead of the usual annual dinner on the evening of the closing session, there should be substituted a smoking concert, which met with the approval of the majority of the members.

At the evening session the president, Mr. Eugene Coste, delivered his annual address, which we present in full on another page. The first paper of the session was one on the "Artesian and other Deep Wells on the Island of Montreal," by Dr. F. D. Adams, of McGill University. The substance of the paper showed that, although during the last fifteen years a large number of deep wells had been bored upon the Island. Investigation showed that there was no definite water below the strata at any given depth. Out of eighty-nine deep wells which penetrated to depths ranging from 150 to over 1,500 feet, water was obtained in some and not in others. Underlying the city were the Trenton, Chazy and Calciferous formations, and water was found in all of these. In some cases no water had been found, and results of boring were extremely uncertain as to what kind of water might be obtained at any given depth, but as a general thing, the water obtained at a lesser depth than 750 feet (that is, in the Trenton or Chazy formations) was fresh water and palatable, although in some cases the water was too hard for domestic use. When the wells penetrated to the Calciferous formation, the water was usually sulphurous. As to the flow of these wells, the chances of obtaining a larger supply than about 5,000 gallons a day were about 7 to 9.

After a discussion, which was of great interest, Prof. G. R. Mickle, Toronto, read a paper on the "Value of Undeveloped Mining Claims," which was followed by a paper from Mr. Frederick Hobart, of New York, associate editor of the Engineering and Mining Journal, on "Canadian Metallurgical Products in the Far East."

Mr. Hobart pointed out that the mineral production of Canada was rapidly increasing along certain lines to a production which was greatly in excess of domestic needs, and that some outlet for the surplus of such production is needed. Mr. Hobart said that, to him, it had seemed that Canadian producers should look to the Far East rather than to Europe and the United States for such an outlet. China, Japan and India constituted a market for many metallurgical products which could be reached more easily and cheaply from the two ports of Vancouver and Victoria than from any other part of the Dominion. He alluded to the fact that one of the most important products of western Canada (lead) was shut out of the United States by a high protective tariff, and suffered disadvantages in respect to the European market by the long railroad haul to the Atlantic, and the subsequent long sea voyage to Europe, where it met with competition from the lead produced by the United States and Spain. Some Canadian lead had already been successfully marketed in the East, but

there was no reason why a larger quantity should not be sent. The market price of lead in the Eastern countries was governed by the London quotations, and there was every reason to believe that the lead would command a better return if shipped across the Pacific than if transported overland to European markets.

Mr. Hobart further mentioned the large copper production which British Columbia was now making, and alluded to the present great demand for this metal in China and Japan, owing to the Russo-Japanese war. He stated his belief that a permanent market, irrespective of the war, would be obtained there with only the expense of an ocean rate, leaving a large margin of profit for the producers. He also alluded to the large demands for bronze and brass in the East, and believed that a profitable market for British Columbia spelter could also be found there. He spoke briefly on the markets for iron and steel, and the advantage British Columbia has in possessing large quantities of good iron ore. Generally, the Far East needed metals, and he believed that Canada could easily have her share in supplying that demand.

THURSDAY'S SESSIONS.

Thursday morning was given up to the reading of students papers, which were contributed in competition for the president's medal and the annual cash prizes which the Institute awards to meritorious student papers. They were, generally, commendable, and provoked considerable discussion. We have not space to notice these in full, but hope to have an opportunity of printing the best of them shortly.

The session on Thursday afternoon continued the reading and discussion of papers set down in the official programme, and the president announced that the evening session would be devoted to papers illustrated by lantern slides, and for this purpose the courteous offer of the Canadian Society of Civil Engineers of their lecture room and lantern had been accepted, and that the members would meet, therefore, at 877 Dorchester Street for the evening session.

The first paper of the evening was an interesting address on electric smelting, given by Dr. Eugene Haanel, Superintendent of Mines, of the Department of the Interior, Ottawa. Dr. Haanel's address was an interesting and admirable summary of the extremely valuable monograph recently published on *Electro-Thermic Processes for the Smelting of Iron Ores*. Dr. Haanel began by drawing attention to the well-known fact that iron and steel were the foundation of all other industries, and that the country which required to import its iron was severely handicapped in the modern race for commercial success. As illustrating this point, he stated that during the fiscal years of 1903 and 1904 the Dominion of Canada had imported pig and bar iron, and manufactures of iron, to the value of \$43,107,599, showing the dependency of Canada at the present time on other countries for iron in a manufactured state. The present demand was contrasted with the probable future demand, arising from the increase of population and the remarkable increase in business which had been witnessed during the last decade. Dr. Haanel alluded to the measures which had been passed by Parliament tending to the stimulation and encouragement of the production of iron and steel, noting the bounty on rails and the import duties on articles manufactured from iron and steel. The Doctor drew attention to the fact that blast furnace work had only been found possible in the East, and that good metallurgical fuel was found on both the Atlantic and Pacific coasts, therefore necessitating either a long haul of ore to the blast furnaces or a long haul of coal to the ore, should attempts be made to create an iron in-

dustry in the central portion of Canada. The Doctor spoke at length on the subject of electric smelting, describing the different processes which had been found commercially successful abroad, noting the limitations of some of these, and closing with the expression of his own opinion that we are on the eve of great achievements in the application of electric energy to the extraction of metals from their ores, and his belief that the undeveloped water powers of Canada would shortly be employed for the manufacture of different grades of iron and steel from ores which had been proved to exist in large quantities in the central portions of the Dominion. Dr. Haanel's lecture was an admirable presentation of the present condition of the art of electrically smelting iron.

Mr. J. Obalski, Inspector of Mines for the Government of Quebec, followed with a short paper on "A New Mining District in Quebec." Mr. Obalski's remarks were a resumé of the results of a trip which he was directed to make in the fall of 1904 by the Hon. S. M. Parent, Prime Minister, on application of Mr. Peter McKenzie, who has had business in that section for many years, and whose discoveries were deemed of sufficient importance to justify an examination of the district by a Government official.

The last paper of the evening was given by A. P. Low, who commanded the Government steamer "Neptune" during a cruise in the Arctic regions in 1903 and 1904. This address was illustrated with lantern slides of particular and exceptional beauty, and was perhaps the most interesting paper of the evening. Mr. Low mentioned the existence of a mica mine in Baffin's Land, now being worked in connection with a whaling outfit, which was paying handsomely. He dwelt upon the indications of copper ore which occurred along the eastern side of Baffin's Land, and upon immense coal fields, the outcrops of which were visible on islands to the north and west of Lancaster Sound. These deposits, although of great extent and of good quality, could not be made of value owing to conditions of climate. There were indications also of copper deposits on the western side of Hudson Bay, and of iron ores on the eastern side; none of these indications had been at all exploited. Also on the shores of Hudson Bay were outcrops of lignite, probably of the Tertiary period, which showed no evidence of disturbance by glaciation.

FRIDAY'S SESSIONS.

On Friday morning the entire session of the Institute was devoted to discussing the report of the Sub-Committee on By-laws, which committee had been in deliberation throughout the session. Prior to the opening of the meeting a draft of proposed by-laws, as suggested by the President, had been sent out to all the members in advance, and also a draft of the proposed by-laws, as amended and recast at a Council meeting held in January. The fundamental differences between the two sets of By-laws were confined to two points, the first of which was the establishment of branches of the Institute in different parts of the Dominion, wherever ten or more members of the Institute were located in such section; the granting to such branches of final decision on matters of local interest; and the further important matter of arranging for the diversion of funds from the treasury of the Institute to the support of such branches. The second point of difference was in respect to the constitution of the Council, or governing board, of the Institute. The one draft proposed that representation should be made on the numerical basis of members resident in each province, allotting one councillor for each 15 members in good standing; the second set of proposed by-laws kept the representation of the Institute to four members of Council from

each of the four constituent provinces, (Nova Scotia, Quebec, Ontario and British Columbia). Mr. Geo. E. Drummond, Montreal, spoke against the representation according to numbers, stating emphatically and clearly that such a method would give the Institute a provincial flavour which might be very objectionable in the future of the Institute. He thought that too much attention was paid at present to lines drawn between the Provinces, could see no reason why such a principle should be perpetuated, and deprecated its existence. Prof. W. G. Miller strongly advocated representation in the Council according to strength of members in the various provinces, and Prof. Miller's view was endorsed by several of the Ontario members.

Mr. John E. Hardman, Montreal, drew attention to the phrases in the first and third paragraphs of the Charter granted to the Institute by Parliament, wherein the objects of the Institute were stated to be the promotion of the arts and sciences connected with the economical production of minerals and metals, and the taking of concerted action upon matters which affected the mining and metallurgical industries of the Dominion. Mr. Hardman suggested that, in view of the many difficulties which had arisen in the past six years of the Institute's existence which were directly attributable to the growth of provincialism and provincial ideas, the time was ripe for a departure from the old method of representation in the Council. He drew attention to the fact that, under the proposed representation according to numbers, British Columbia would have only three members and Nova Scotia but two members, whereas the Province of Ontario, whose mineral production was in no way comparable as yet, with either the westernmost or easternmost province, would have a representation in excess of the combined representation of those two provinces. In view of these existing facts Mr. Hardman endorsed the idea contained in Mr. Drummond's remarks, and moved an amendment to the effect that, the Council should be composed of 16 members at large, that such 16 members should be selected solely with a view to the representation of the most important mining and metallurgical interests of the Dominion, leaving it to the sound sense and discretion of the Nominating Committee to see that representation be made without regard to provincial lines. This view met with the approval of the meeting, and Prof. W. G. Miller seconded Mr. Hardman's amendment, which was carried without dissenting voice. The Institute, therefore, is now truly national as regards its Council, and is emancipated from any provincialism which may in the past have obtained. The disputed point as establishment of branches was properly left, in a suitable paragraph, to the discretion of the Council to establish, from time to time, such local branches as it might see fit, and giving to the Council discretionary power as to granting financial aid from the home treasury.

The section relating to the Nominating Committee was amended so that, as now adopted, the Nominating Committee is composed of one member from each of the four more important provinces, with one member at large to represent the Yukon Territory, Alberta and the smaller portions of the Dominion, and it was believed by all the members present that a committee so constituted would be more acceptable to the members at large and more apt to select truly representative officers, than has been the custom in past years. Some changes were also made in the manner of issuing ballots, which changes were in the line of advancement and improvement. The ballot which will be sent out in the future will distinguish the names which have been approved and selected by the Nominating Committee by an asterisk placed before the nomi-

nee's name; names not thus proposed by the Nominating Committee will be without the asterisk.

This session was the longest of all that were held, but the members may congratulate themselves upon having done more effective and valuable work during the Friday morning session than in any other session for some years past.

Friday afternoon's session opened with the report of the scrutineers who had been appointed to count the ballots and report the officers elected. Owing to the diversity of ballots which had been sent out, the fact that some of them had been destroyed, and that most of the ballots were scratched, the work of the committee had been unusually arduous, and, owing to the important discussions which took place during the morning session on the by-laws, Mr. Frederick Hobart, of New York, was appointed as scrutineer in place of Prof. W. G. Miller, who was the chairman of the committee to which the by-laws had been referred. The scrutineers' report was a unanimous one, declaring the following members to have been elected to their respective offices:—

President—George R. Smith, M.L.A., Thetford Mines, P.Q.

Vice-President for Nova Scotia—Thos. Cantley, New Glasgow.

Vice-President for Quebec—Dr. F. D. Adams, Montreal.

Vice-President for Ontario—Dr. W. L. Goodwin, Kingston.
Secretary—H. Mortimer Lamb, now of Victoria, but presently of Montreal.

Treasurer—J. Stevenson Brown, Montreal.

COUNCIL:

Nova Scotia—

D. W. Robb, Amherst.

Chas. J. Coll, Stellarton.

C. A. Meisener, Sydney.

Quebec—

H. J. Williams, Danville.

R. T. Hopper, Montreal.

J. Obalski, Quebec.

Ontario—

Dr. A. E. Barlow, Ottawa.

A. B. Wilmot, Sault Ste. Marie.

British Columbia—

R. R. Hedley, Nelson, B.C.

On the retirement of President Coste from the chair, the new president, Major Geo. R. Smith, M.L.A., of Thetford Mines, Quebec, briefly acknowledged the honor which had been done to him by the members in electing him to the presidency, and declared his great confidence in the other officers who had been elected with him. He said that his sole ambition as president would be to carry on and perfect the great work for which the Institute had been organized. Major Smith outlined briefly the history of the Canadian Mining Institute, showing its gradual evolution and formation from the provincial organizations which had preceded it, and said that to-day it was an organization truly national, whose strength was known from the Atlantic to the Pacific, and the expression of whose opinion would have due weight with any government in the Dominion.

A vote of thanks to the retiring president was made, and then the session proceeded with the reading of additional papers, one of the most interesting of which was on the "Cobalt-Silver-Nickel-Arsenic Ores of the Temiscamingue District," by Prof. W. G. Miller, of Toronto.

The business sessions having closed, the evening was devoted to a smoking concert, which was truly representative, and was an exceedingly entertaining and interesting session. Outside and Institute talent were both freely drawn upon for songs and musical contributions, but an unexpected and most gratifying feature of the evening was an exceedingly able and instructive address by Mr. Frederick T. Congdon, ex-Governor of the Yukon Territory.

GOVERNOR CONGDON'S ADDRESS.

Governor Congdon began his talk with a brief reference to the good quality of the administration of law and order in the Yukon Territory, which was due, he claimed, to the excellence of Judge Dugas, whom the Province of Quebec had sent to the Yukon; and also to that glorious body known as the North-West Mounted Police. He paid a tribute to the excellent work which had been done by Comptroller Lithgow, and the general character of the support which the Administration received from its officials in the territory. In speaking of the methods of working which hitherto had been in use there, he mentioned the unsuitability of sluicing methods for mining on a large scale, and the probability of the adoption of hydraulicing to the frozen gravels of the territory. Formerly, it had been supposed that frozen ground could not be successfully worked by an hydraulic process, but it had been found that, during five months in the summer, the face of the ground would thaw so rapidly as to permit of most successful hydraulicing. Alluding to the supposed exhaustion of the gold fields of the Yukon, he claimed that this idea had gotten abroad because of the limits of ordinary sluice mining, and made the statement, without fear of contradiction, that the real mining days of the Yukon Territory had not yet begun, instancing the working of Gold Hill and other portions of the district as examples of what might be expected in the immediate future.

Mr. Congdon also alluded to the expensive mistakes which had been made in installing huge pumping plants for the purpose of pumping water to the hillside and bench gravels, mentioning one plant which had cost over \$300,000 to install, which used daily, as fuel, from fifteen to twenty cords of wood which cost from \$15.00 to \$20.00 per cord. He also spoke of the work which was done last year in bringing in 3,000 miners' inches of water to a reservoir placed back of Dawson City, and its successful operation, and the further enlargement of the plant by the construction of a reservoir to afford a supply of 10,000 miners' inches, which had been built 600 feet above the level of the first reservoir, or 1,200 feet above the city of Dawson. As an example of good engineering this case was mentioned, and it was also mentioned as testimony that corporations in the Yukon were not disposed to be exorbitant in their charges, since the company which had built these reservoirs and ditch lines was willing to sell water at the rate of five cents per miners' inch per hour. Mr. Congdon also mentioned the new finds of coal which had been made recently, and which had proved to be of a superior quality, and also spoke of the deposits previously found on Coal Creek and vicinity. He referred to the fact that coal seams had been found near White Horse which afforded both good coking coal and anthracite, or coal of anthracitic nature. The copper deposits of the White Horse section were also mentioned, and a brief account of the Copper King mine given. This deposit of the Copper King is eight feet in width, and gives an average of twelve per cent of metallic copper; contained in this eight feet width is a streak of from five to eight inches of pure bornite.

Mr. Congdon concluded with an expression of his strong desire that the Canadian Mining Institute, as a body, might shortly be able to visit the Yukon Territory, where, he assured them, the inhabitants would give them a most cordial reception. He spoke encouragingly of the value and utility to Canada of a body of men trained and educated as the members of the Institute were, and closed with an expression of his sympathy with the aims and objects of the Institute, and appreciation of the privilege which had been extended him of addressing the members upon the subject of the Yukon.

Dr. W. H. Drummond contributed several recitations from his writings which, as usual, were very highly appreciated.

This annual meeting probably had more important work before it than any annual meeting which has been held since the inception of the Institute in '98, and the members may be congratulated upon having discharged important duties efficiently and promptly. The meeting was also marked by the presence of several gentlemen, whose attendance from distances was appreciated. Mr. A. C. Garde, of British Columbia; Mr. Frederick Hobart, of the Engineering and Mining Journal, New York City; and Mr. W. J. Johnston, publisher of the Mining Magazine, New York City, were interested attendants, and some of these gentlemen participated in the discussions and conduct of the meeting. Mr. Johnston was so much interested that his application for membership was sent in during the meeting, and he returned to New York having been duly elected a full member of the Canadian Mining Institute.

The Mine Fire at Dominion No. 1 Colliery.*

By SHIRLEY DAVIDSON and NORMAN MCKENZIE.

Dominion No. 1 Colliery, one of the oldest in Cape Breton, was first opened in 1831 by the General Mining Association. After abandonment for some years it was acquired by the Dominion Coal Co., in 1893, and was reopened by the present shafts and equipped with modern machinery. The mine has three shafts, one each for coal, air and supply of materials.

The bankhead consists of a steel structure containing modern appliances for picking and screening coal and delivering it to the railway cars, there are also belt conveyors to carry coal to the boilers of the plant and to the Company's locomotives. The colliery uses 46 coal mining machines. The colliery, at the time of the fire, was producing on an average 55,000 tons of coal per month, and employed about 800 men.

The main or coal shaft, generally used as an upcast—although the current may be reversed—is 154 feet deep, 10½ feet wide by 24 feet long, and consists of three compartments, two for coal and one for men. The Fan shaft, 143 feet deep, 11 in diameter, can be connected to either one of the three fans, and is generally used as a downcast. The material shaft, 135 feet deep, is 10 feet wide by 18 feet long, and also contains the endless haulage ropes, which are brought to the engine house located on the surface directly alongside.

These shafts are sunk about 1,900 feet south easterly from the crop of the Phalen seam. The surface in the vicinity is 89 feet above sea-level, while the pavement is 68 feet below sea-level. The ground slopes gently to the shore line of the Atlantic Ocean, distant 1,800 feet, where it breaks abruptly into low cliffs, exposing the seams of coal and the remains of

* A paper read before the Mining Section of the Canadian Society of Civil Engineers.

some old workings, supposed to be those of the French many years ago.

The Phalen seam averages about 8 feet 4 inches of clear bituminous coal, which dips in an easterly direction, the angle, or inclination, of dip being about 1 in 15. The floor of the mine is a very gritty shale, and the immediate roof is also a shale, which readily falls at times, but is easily supported by timber. The plan of working is the ordinary "room and pillar"; the deeps, headways and levels are driven 12 feet wide, and the rooms 22 feet wide. The size of the pillars left is 25 feet by 70 feet. The present faces of the workings have reached a distance from the shaft of 5,700 feet in the North deep, 5,400 feet in the South deep, and 3,000 feet in the Angle deep. The overhead cover at the face of the North deep is 519 feet thick.

The mine made some 500 gallons of water per minute, but had also to take care of 800 gallons per minute from the Main and French slopes of the Reserve Colliery, which quantity passed through a borehole in the barrier separating Dominion No. 1 from Reserve, and flowed along No. 3 South level to the water lodgment on the back North deep, from which it was pumped to the lodgment at the shaft bottom through a 7-inch pipe. There are three water lodgments in the pit, one of 500,000 gallons capacity is located at the shaft bottom, one of 500,000 gallons capacity is about 2,000 feet from the shaft on the North back deep, one of 900,000 gallons capacity is at the face of the South deep as shown on the plan. The first two are connected, as noted above, by a 7-inch pipe laid up the North Main deep, the lower pumping into the upper from two three-hundred gallon Cameron pumps: the upper then discharges vertically up the shaft to the surface through one 300 gallon Cameron pump. The lodgment at the face of the South deep contains a 1,000 gallon duplex pump, which discharges vertically 430 feet through a borehole into the International Mine, from whence it flows by gravity to the sea. Another borehole driven from the surface, 519 feet in depth, contains the steam and the exhaust pipes one within the other. Steam is supplied by the boilers at International Mine, located on the surface almost directly overhead.

The underground workings of Dominion No. 1 cover an area of 560 acres, and had produced from this area approximately 3,400,000 tons up to the time of the fire.

Inflammable gas is met with in very small quantities, but an efficient amount of ventilation is maintained by a powerful 24 feet Dixon fan, which circulates 114,000 cubic feet of air per minute.

A water service is maintained on the surface through a 6-inch pipe leading from a small stream distant about a mile from the colliery. An efficient supply is kept up by a 250 gallon Knowles pump. The stream is dammed, and forms a reservoir capacity of 7,000,000 gallons on the edge of which is located the boiler, pump and pump-house.

About 3.30 in the morning of Thursday, March the 19th, 1903, a workman returning from work discovered fire in a cross-cut between the Back and Main North deeps, near No. 3 landing, about 1,200 feet from the shaft bottom and about 147 feet below sea level. The opinion is that it was started on the back deep side of the stopping by a workman carelessly throwing away the lighted wick from his lamp, or, contrary to all rules and regulations, kindling a fire in order to warm tea. This back deep is used as a travelling road, and the stopping in question was the same as all others built in the cross-cuts in the pillar between the Back and Main North deep. It was composed of hemlock boards lined with brattice cloth: the

average width of this particular cross-cut was 12 feet. Some loose boards were lying alongside, and it is probable that some rubbish had also collected.

On account of the location, the fire was an exceedingly difficult and dangerous one to deal with. Alongside of it to the North was an old and abandoned section, where some time previously a bad crush had made it necessary to protect the pillars along the travelling road with a considerable number of props lagged behind. The workman who made the discovery, instead of making any attempt to stamp out the fire, as might have been done in this early stage, fled to the shaft bottom. This he reached after a difficult passage through the smoke, which quickly collected and poured up both North Deeps with the air current to the shaft.

He gave the alarm to the underground manager, who, with an overman, immediately travelled directly towards the fire, through the smoke, on the Back Deep. Orders were given to the bottomers to follow down with buckets. When within seven hundred feet the glare of the fire was distinctly seen, extending across the Deep, and when the cross-cut was reached, the place was a mass of flames, and the top of the coal was scaling.

A shovel—the only appliance at hand—was of no practical use; it was impossible to get about the fire, on account of the dense smoke, and the underground manager, seeing that the fire was beyond his control, made for the shaft bottom for proper appliances and more help. The men at the bottom refused to give this, so he started back alone, but this time by way of the Angle Deep and No. 6 North Level, where he met some miners who followed him to the fire.

Orders had been given to send down hose to connect with the seven-inch discharge from the lodgment nearby. The first lot was abandoned on the Angle Deep so that this connection was not made until the arrival of the second lot by way of the South Deep.

Assisted by the air current the smoke quickly gathered in volume, and barred all entrance to the pit by way of the shaft. Mr. McKenzie, the manager, who was immediately notified, was compelled to enter the pit by the travelling slope, which is driven from the crop, north of the shaft. He first reduced the speed of the fan. On the way down he gave orders to remove the horses, but all were suffocated before this could be done. As travelling by either of the North Deeps was impossible, he proceeded over the air crossing at the fan shaft bottom and through the fan shaft to the South Deep, and down the South Deep to the fire.

Timber and brattice were then put up across the main deep as the only possible means of excluding air from the fire.

The seven-inch discharge line from the lodgment nearby was broken, and after considerable delay in receiving the hose, two lines were connected to it. One was carried directly to the fire cross-cut, while the other worked through the first cross-cut above the fire in the Main North Deep.

By this time the roof of the back deep had already fallen, so that it was impossible to follow the fire through the cross-cut, where it had started and the work of extinguishing was therefore practically confined to the Main Deep, which was not so badly fallen, and, therefore, more accessible.

The morning of the fire it was difficult to persuade the men to work, as the conditions were very similar to those at Caledonia not long before, when a fire broke out in that colliery. There, an explosion occurred, causing the death of eleven men, including the underground manager, who had formed a party to locate it. In both cases the fire was near old and abandon-

ed workings filled with damp. This made the men nervous and afraid for some time, but after the first day there was no difficulty in obtaining all the men required.

The managers from the different collieries came and brought with them their subordinate officials and any men who had had experience with fire in a mine. These were organized in three shifts, of eight hours each, one of the managers being in charge of each shift, with a mine official leading each gang. Each shift was composed of five gangs who fought the fire from different points.

The fire brigades from Glace Bay and Sydney composed some of these gangs, and brought with them all the available hose. Besides those fighting the fire, a gang on each shift moved coal cars, mining machines, mine tools, etc., from the pit. Another was kept busy sending down material, such as brattice cloth, timber, etc., while a third took charge of the ventilation, and was supposed to travel all the places clear of fire and smoke and to see that no gas accumulated in any part of the mines.

Two more lines of hose were now laid from the material shaft down the South Deep and across to the Middle Deep, one working from the top cross-cut, into the Main Deep, while the other was carried down to the next cross-cut in the middle deep. An ample supply of water was kept on these by means of two 500 gallon pumps, which were temporarily set up alongside of the railway by the dam and driven by steam from a locomotive standing on the track. Two lines of wrought iron pipe 5 inches by 4 inches respectively were laid from this point along the surface to the shaft where the hose were connected and dropped to the bottom. It was now impossible to ascertain the distance the fire had travelled towards the pit bottom on the Deep Back, as the only two cross-cuts available were those between the Middle and North Deeps, and these were being made use of to fight the fire on the Main Deep. Smoke barred all other passages to the Back Deep. This being the case, an attempt was made to reach a point 600 feet above the fire cross-cut, on the Back Deep by following down the old horse road north of the Back Deep. After several attempts this point was reached, but the smoke was so thick and the heat so intense, that while only a short inspection could be made, it revealed the fact that the Back Deep had fallen in up to this point, although no fire was in sight. The drain which carries some of the water from Reserve through the rise workings of Dominion No. 1, amounting to from 500 to 1,000 gallons a minute, was also diverted to this point and allowed to flow into the Back Deep.

As, contrary to all expectations, the fire was not seen at this point, another attempt was made to reach it in this crushed district through room 30, which intersects the Back Deep a short distance above where the fire started. The object of this was to find out if the fire had worked its way through the stone stoppings which separate the Back Deep from the crushed and abandoned area, and also, if possible, to break through these stoppings and adopt the same method of fighting as on the Main Deep, namely before and behind. This method promised reasonable hope of success.

On the night of March the 23rd, 1903, after a very difficult and dangerous passage along room 30, a point was reached 750 feet from the Angle Deep and 200 feet from the Back Deep stopping, where it was discovered that the fire was making way into the old rooms. The necessary pipe had been laid down the Angle Deep and hose had been carried along to this point and were ready for use, but to attempt to extinguish the fire by this means in this old and abandoned section with its

scores of openings, dangerous roof and stone filling was absolutely useless and a waste of time.

The work of fighting the fire from behind on the Main Deep and watching it at the first cross-cut from the Centre Deep was continued under the most disheartening circumstances, for the conditions were most unfavorable, as the section was the worst in the mine. The behaviour of the men was splendid, although they knew fire damp existed, and there was constant danger of an explosion; and, in spite of smoke, heat, and falls of roof which drove them back time and again, they stuck to their posts till all hope of saving the mine was abandoned.

The fire was now travelling so rapidly, that fears were entertained for the safety of the shaft, the loss of which meant the loss of the pit. A careful survey was made of No. 4 North Landing to ascertain if it was possible to construct dams of sufficient strength to retain water in this section, but the pillars were so badly crushed and the roof so badly fallen that this was considered impossible.

The question of submerging the whole of the north side was abandoned for the same reasons. In the meantime two dams had been built across the roads connecting the North and South Deeps in order to protect and keep in operation the big 1,000 gallon pump, which took care of the water from the lower section of the pit. These withheld a considerable amount of water in the north side and kept the pump for the time being from being submerged by the water which was now entering the pit in considerable quantities through the hose and drainage from Reserve. In order to ascertain how far the fire had travelled up the Back Deep during this time, Mr. McKenzie (and several others) after several unsuccessful attempts in which the lamps were extinguished by damp, finally succeeded in reaching a point 600 feet above the fire cross-cut, where it was discovered that the fire had passed this point, and was quickly approaching the shaft.

After this discovery on Saturday, March 28th, 1903, nine days after the fire started, complete submersion was decided upon. All the mining machines, with the exception of two, 280 pit tubs, all miners' tools, all horses, including the dead, were removed from the pit, together with parts of the electric locomotive. The mine was then sealed as closely as possible to prevent air entering to the fire, but it had been worked in so many places under a cover of only 100 to 200 feet, and the falls caused by drawing the pillars had extended to the surface, thus making it impossible to exclude the air completely, even after taking all possible precautions.

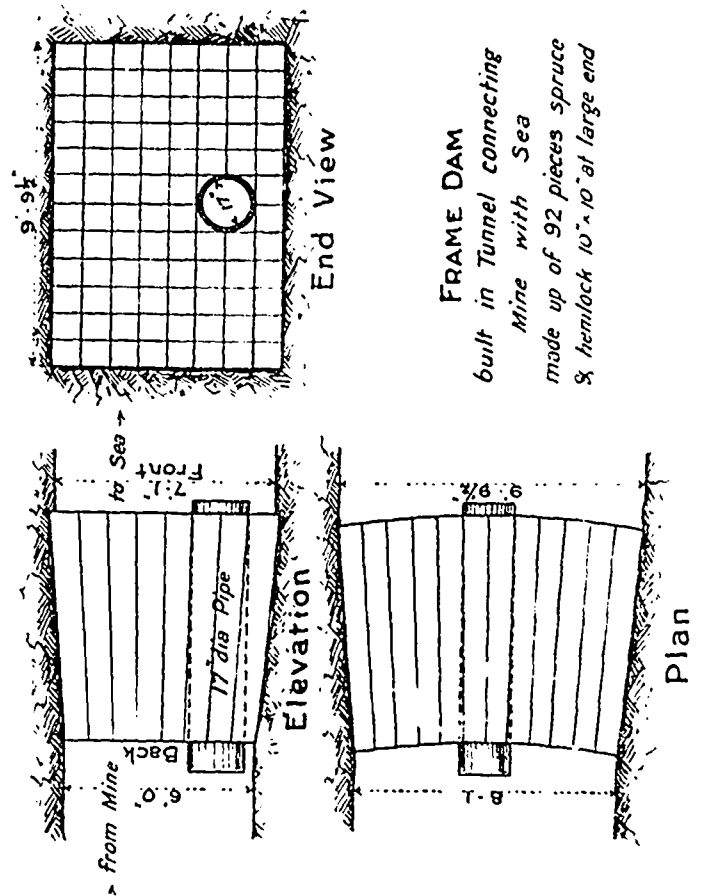
No time was lost in turning on water from all the available sources of supply. Through an old room in the rise workings, a drain was driven through to the crop to catch the water of a small brook flowing by this room. One 1,000 gallon Northey pump and two portable boilers were set up on the shore of Lingan Bay, distant 800 feet from the travelling slope. An 8-inch pipe was laid between these boilers and the mouth of the slope. This water, together with that from the small brook, united with the drainage from Reserve and flowed down the travelling road into the Back Deep, 700 feet above the fire cross-cut. This amounted to 1,350 gallons per minute, or in the fifty days from April 1st to May 20th, to 97,000,000 gallons. It was estimated that 516,000,000 gallons were necessary to bring the water to a level that would cover the fire area which now extended nearly to the shaft bottom.

To have filled the mine from this supply alone would have taken many months. To hasten the submersion, it was decided to call into requisition the waters of the Atlantic. A tunnel

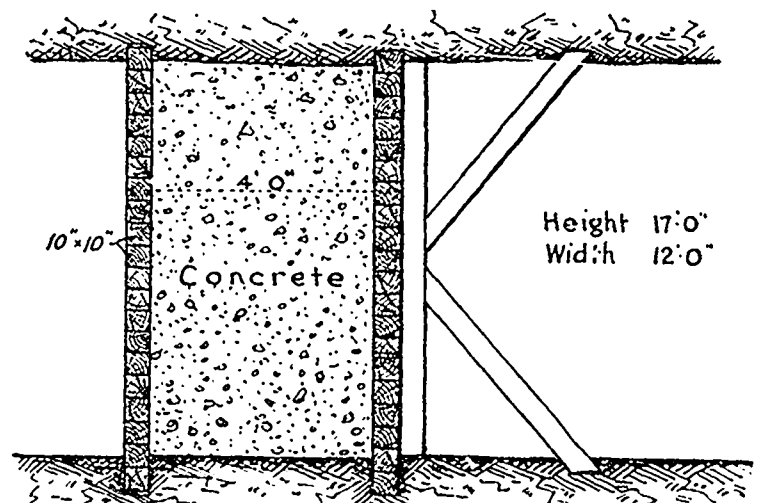
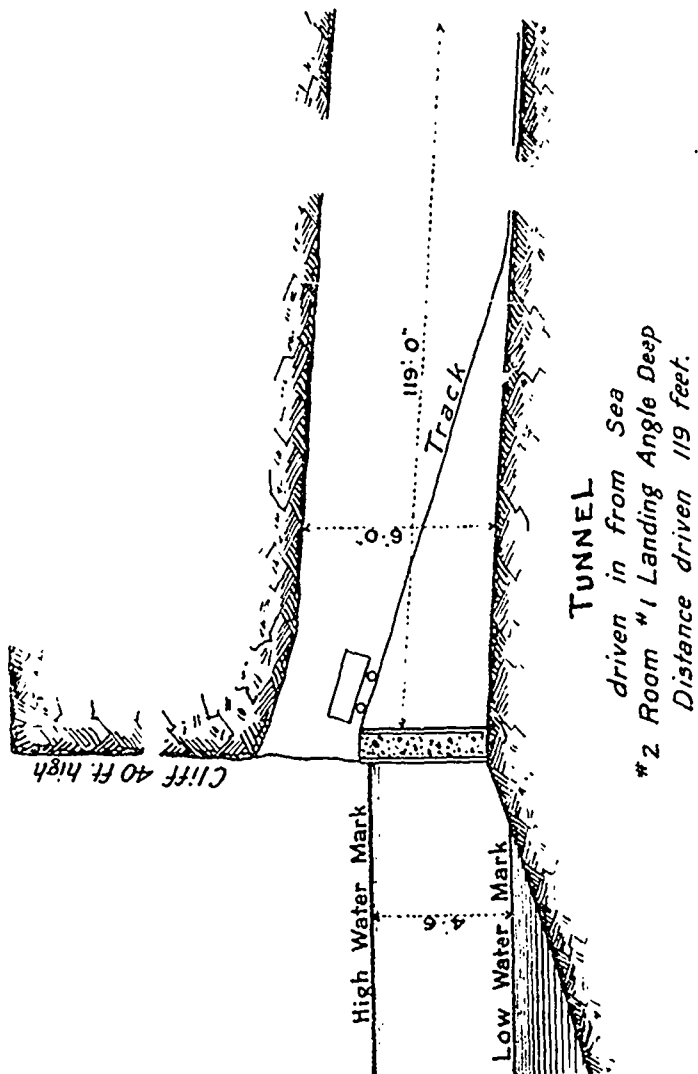
119 feet long, 6 feet high and 6 feet wide was driven in from the shore to the nearest room, which was Number 2. This was driven in four days, or an average of 30 feet per day by machine cut, for which an air line had been laid along the surface from the compressor house. The coal was loaded in a tub placed on the track laid for the purpose, and hauled out to the shore by hand. While the work was in progress a temporary dam was constructed across the opening, in order to seal off the pit at high tide, when it would otherwise have filled the tunnel, and delayed the work. This was composed of two walls of three inch plank separated by an eight inch space, which was filled with concrete. A sliding door four feet by four feet, located above high tide, afforded a means of entrance and exit to and from the tunnel. Beneath this, after completion, another door, four feet by four feet, was cut and used as a means of regulating the flow of water into the pit. The sea was first let in on April 7th and finally closed on May 23rd—a period of 46 days—but the flow of water was not continuous. The actual time of flow in this period amounted to fifteen days, during which it is estimated that 420,000,000 gallons entered the pit at a rate of 28,000,000 every 24 hours. 96,000,000 gallons entered by the other means mentioned, which totals 516,000,000 gallons. This brought the water level with the bottom of the shaft.

After the pit was submerged the opening was stopped by a permanent dam, which consisted of 92 pieces of spruce and hemlock (10 inches by 10 inches at one end, and eight inches by 10 inches at the other end) each piece being faced on two sides with one inch pine boards. Its thickness was about seven feet. Through the lower portions of this dam a 17 inch dia-

meter pipe was laid with a plug at the lower end, which was forced into the pipe by the pressure of the sea when the flooding was completed.



Readings of the rise of water in the pit were taken by means of a float and wire dropped down the borehole to the face of the South Deep. The waters of the sea were shut off from time to time on the assumption that large quantities were withheld in the upper workings by falls and other obstructions, as the borehole readings showed that water raised the level at the borehole for several days after the sea was closed.



WOOD & CONCRETE DAMS
On Level connecting Main and French Slopes of Reserve.

Another source of anxiety and cause of delay in flooding was the question of strength of Reserve Barrier. Below No. 5 South Level of Dominion this was sufficiently thick to withstand the pressure brought to bear upon it, but above that

point (or from the bottom of Reserve Main Deep) the surveys showed varying thicknesses. The water from the Main and French slopes of Reserve flowed through a borehole driven through the barrier at a point in the face of No. 3 South Landing of Dominion, and here the thickness was 53 feet. The face of the Reserve Main slope is 198 feet below sea level which, when the water was on a level with the bottom of the shaft, was under a level of 130 feet, or 57.2 pounds per square inch, which equals 4.1 tons per square foot. To guard against any possibility of accident through the failure of the barrier, and in order to protect the workings of Reserve other than those of the main slope, two dams consisting of ten inches by ten inches spruce and hemlock laid in two walls with four feet of concrete between were built across the narrow places of No. 10 Landing, which was the only connection between the main slope and the rest of Reserve. The barrier, however, proved effective. The water worked through the strata and came in in considerable quantities through the roof between No. 9 and No. 11 landings, but outside of heavy condensation on the face of the barrier no other noticeable features developed.

The filling continued as above described until the readings taken at the borehole indicated that the water had reached the bottom of the shaft, but a float lowered into the shaft showed that the water had not reached this point. A close examination of the borehole was then made, and it was found that water bailed out by a bucket lowered the water about 25 feet, showing that the readings taken were not a true indication of the rise of the water in the pit. This method was therefore of no value, and, without any other gauge, the regulation of the flow of water became a matter of judgment.

On April 30th, 21 days after the mine had been first sealed, steam in place of smoke began to issue from the test holes in the shaft, proving that the water instead of being on a level with the bottom had apparently only reached the fire territory. An additional 250,000,000 gallons was therefore necessary to cover this.

Great care was taken to keep the water from actually covering the shaft bottom, as a rise above that point would entail much extra labour and loss of time in pumping out, for then the pumping would have to be started by way of the travelling road and by placing some pumps in the shaft. To provide for this emergency an air line was laid from the compressor house to the mouth of the slope but there was no necessity to make use of it.

On May 11th, nearly two months after the fire started the pit was opened, and the fan started, but smoke made its appearance. The pit was again closed, more water was let in, and again opened on the 23rd May, when no smoke was found. On May 23rd a small hatch, 7 inches by 9 inches, was opened in the coal shaft, and at the same time a trap-door was opened in the tunnel at the shore. The air, therefore, travelled from the trap-door at the shore across the fire district and up the coal shaft.

Parties were organized for searching, underground relief, and superintending operations on the surface. The underground party entered the pit by the travelling slope. Considerable damp was met with, but great care was taken, and no accidents happened. The temperature reached 114 degrees.

Another party which entered the pit by the tunnel at the shore was once driven back by damp, but next day succeeded in connecting with the party on the travelling slope.

On May 24th, 7.30 p.m., the fan was started exhausting, and the main shaft was uncovered. From this time the work

of opening up and arranging for pumping out the pit were vigorously carried out. The water had risen to the shaft bottom, but the pump, although partly covered, was started on May 30th, 1903.

One of the greatest mine pumping propositions was now before the Dominion Coal Co. Time was of great consequence on account of the demand for coal. The total quantity of water required to be pumped amounted to approximately 516,000,000 gallons, besides what the mine made through feeders and falls amounting to 500 gallons per minute. When it was decided to flood the pit, telegraph enquiries had been sent to all pump makers for prices and sizes of pumps on hand for immediate delivery, and it was a case of taking almost anything that could be immediately shipped, and the material and machinery bought for this purpose consisted of the following pumps: 12 Knowles Duplex 14 x 18½ x 10-500 gallons; 4 Smith Vaile Duplex, 14 x 9 x 12-600 gallons; 4 Jeansville 12 x 8 x 18-600 gallons; and two Worthington, 14 x 12 x 10 Duplex, 1,000 gallons; making a total of 22 pumps of a total capacity of 12,800 gallons per minute. The pipe amounted to 27,000 feet of 8 inches, 24,000 feet of 6 inches, 900 feet of 12 inches, 900 feet of 10 inches and 26,000 feet ranging from 5 to 2½ inches.

On the two South Deeps eight pumps were worked, which discharged to the surface through four eight-inch pipes. They were arranged in sets of four on each deep, two pumps connecting to one eight-inch discharge.

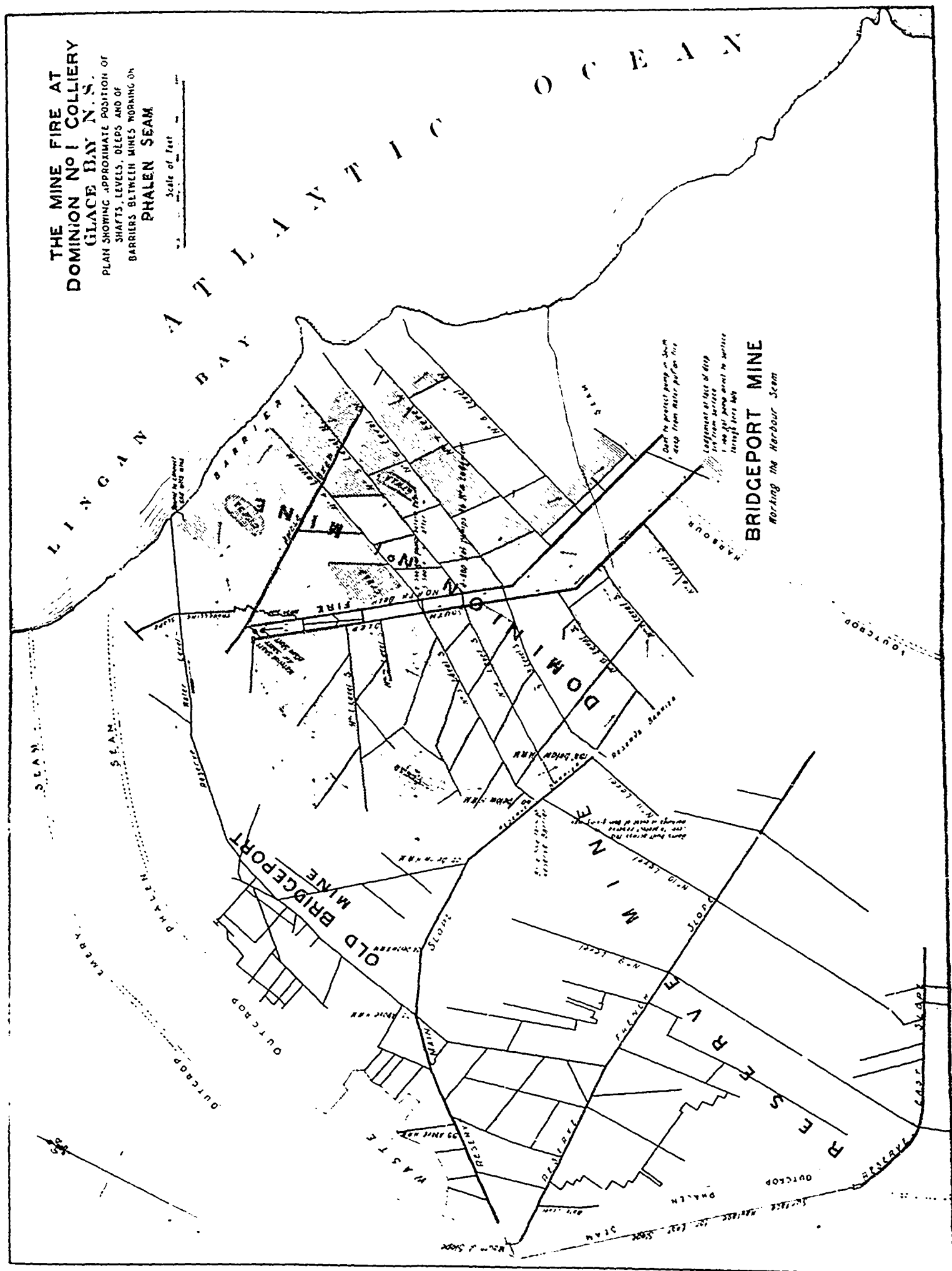
These sets were staggered and moved down the deeps whenever the suction reached a length of 350 feet. The North Deeps down to the fire were so badly fallen that pumping could not be continued in them. Four pumps were therefore carried down the Angle Deep and discharged up the shaft to the surface till No. 1 Landing was reached when discharge lines were laid along this to the tunnel opening to the sea, thus cutting off 80 feet of head. The pumps on this deep were carried along on a suction of about 450 feet until No. 4 level was reached, when they were moved over to the Centre and North Deeps, discharging to the sea through four 8-inch discharge lines.

When the water receded below the lodgment on the North Deep the lodgment was used as a second lift. Five pumps were placed at this point, and water was delivered to them by the four working down the Middle and North Deeps. The eight pumps working on the South Deeps were then pumping to the pit bottom lodgment from which four large pumps pumped to the surface through the material shaft. The pumping was of necessity at times very slow on account of the numerous falls which had taken place by the shifting of pumps and by the resumption of mining before the pit was clear of water.

On May 30, 1904, just one year after the beginning of pumping operations, the mine was completely pumped out. Besides the 516,000,000 gallons which filled the mine, the mine was making about 500 gallons per minute during this period, which amounted to approximately 276,000,000 gallons. The total number of gallons pumped was therefore 792,000,000.

The air compressors which kept these pumps in operation were worked to their full capacity. To relieve them the pumps located around the lodgment at the shaft bottom were driven by steam.

The action of the gases from the fire on the pipes, ropes and iron work around and in the coal shaft was very destructive. All the rope and pipe that had been exposed to it were so badly eaten that complete renewals were necessary.

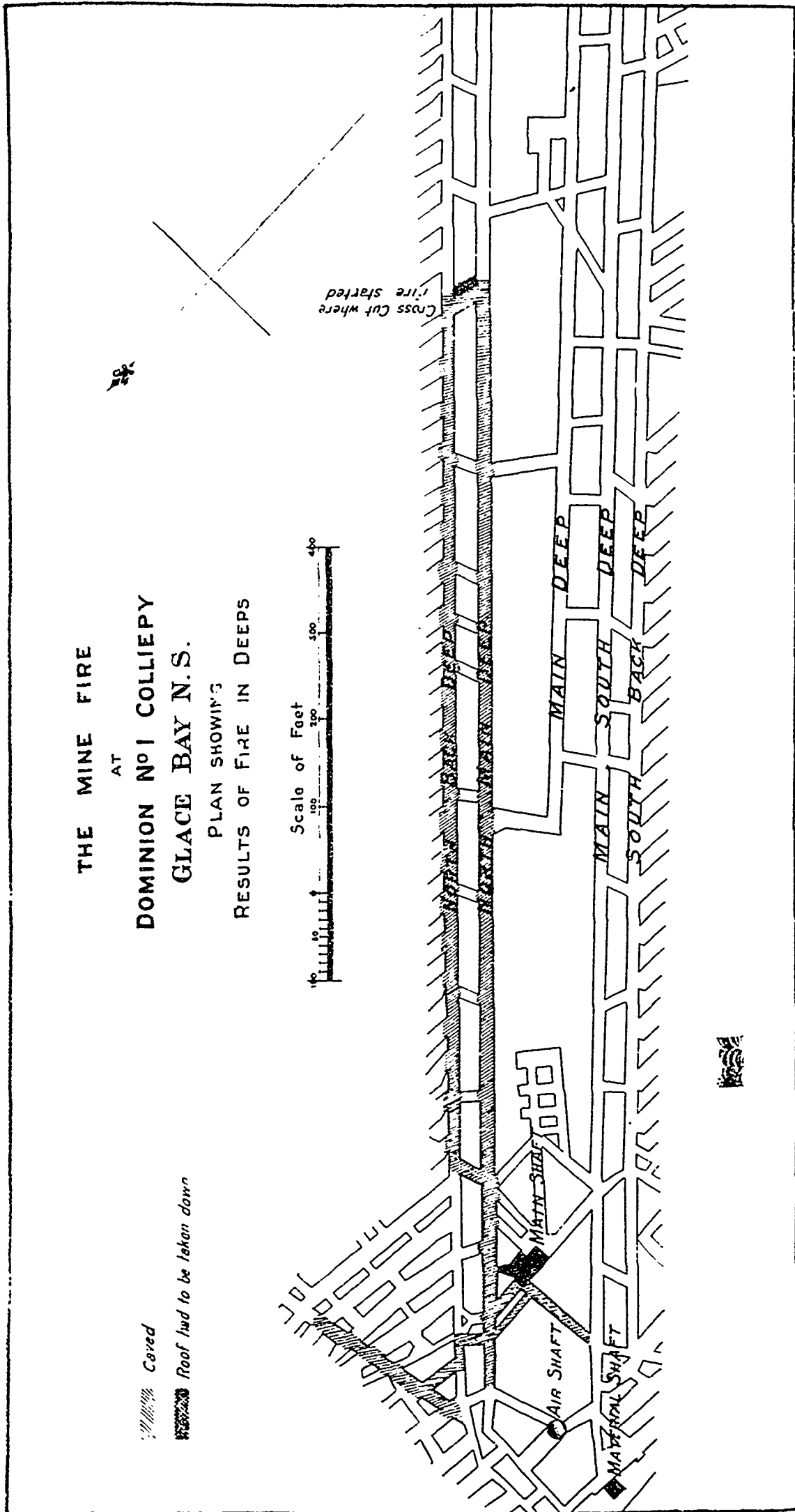


In the fire section of the mine both deeps on the North side had fallen completely to a height in some places of 12 and 15 feet, as shown by the crossed shading in plan. In very few places was it possible to crawl over these falls. This necessitated much labour and expense in cleaning, tunneling and timbering to place the travelling road and haulage way in a fit condition for operation. Even if it had been possible to do without the use of these roads, the shale and roof coal were found to give off a certain amount of heat, on the haulage road particularly. For this reason it was considered better to clear it out than to run the risk of the fire starting again on this deep. There was no apparent reason why the temperature of this material should have been so much higher than at any other place to which there was access unless the dust, which was very fine, combined with oil dropped from the pit tub axles, made the condition more favorable for spontaneous combustion, and with the enormous weight of the roof that had fallen, pressing upon it, excluding the air current.

The stone removed from the walls amounted in round numbers to 25,000 tons, and was removed from the pit. This does not include about an equal quantity which was removed from the falls when reaching the working face, as this was stowed in the mine.

The places where these falls had taken place were newly-timbered. About 3,000 booms were put in, besides props, etc., used for lofting. In some places where the roof was very heavy props were used in the centre of the boom.

No harm was done to the shaft, but around the shaft bottom, as shown on the plan by parallel shading, the action of the heat on the roof made it necessary to bring it down to a height of two feet, which greatly improved the condition of the roads about the place.



The Mines of Ontario.

By W. E. H. CARTER, B.A.Sc.*
(Concluded.)

CORUNDUM MINES.

This abrasive mineral was first discovered in Canada in 1896, in the township of Carlow, County of Hastings, Ontario, and in the two years following received particular attention in the way of exploration of the area of occurrence by Provincial and Dominion geologists, whose exhaustive reports (12) appeared shortly after. No discussion, therefore, need be here undertaken on the geologic phase of the present situation of the industry. The corundum is associated, as a constituent, with igneous rocks embracing the ordinary varieties of syenite, syenite pagmatite, nepheline syenite and anorthosite, and is always crystalline and disseminated. Where mined so far the rock as roughly sorted has contained 10 per cent. or better of corundum, which is a probable average of the various deposits now opened up. Further work in the field by private enterprise has increased the number of known corundum deposits considerably, but only two additional operators have appeared, making a total of three. The Canada Corundum Company, the pioneer, considering, after its four or five years of fairly steady experimental operation on a small scale, that an efficient process of concentration or refining of the corundum-bearing rock has been evolved, has during the past year erected a new plant of very much larger capacity, in fact, to treat about 200 tons of rock per day. This has been completed and started running in March. The method of ore extraction is entirely by quarrying. The finished article is nearly pure corundum, graded into some 15 or 20 different sizes, from No. 12 mesh to No. 200, and is sold in part to manufacturers in the United States, but principally to the Hart Corundum Company at Hamilton, and there made into wheels and various other abrasive goods. In the new refinery the process differs from that in the original plant in that coarse concentration on jigs is done away with, the whole product from the mine passing over the concentration tables, Overstroms, as fines, but closely sized for each table. The efficiency of the process depends directly on the degree of exactness with which the fines or slime pulp for any table is sized, because of the closeness of the specific gravities of the two minerals, corundum and feldspar, to be separated.

A few miles west of the above mine and works the Ontario Corundum Company has since 1902 been getting out corundum rock, sorting it as clean as possible by hand, and then shipping to the United States for complete separation. Lately this preliminary concentration has been assisted by mechanical means in a small plant. The quarry exhibits ore of the same class and quality as at the other mines.

About the same distance to the north the third operator, the Corundum Refiners, Limited, has opened up quarries on other corundum deposits with the intention of shortly erecting another refinery in the district.

Interest in this economic mineral has increased considerably now that the abrasive market is likely to be appreciably affected by a continuous supply from these mines. Although costing more to produce than its rival, emery, the superior quality of the corundum for many abrasive uses, appears to

more than compensate for the difference. Unlike emery it does not destroy the temper of the tool or other metal article ground.

GRAPHITE MINES.

The industry of mining and refining this mineral can point to but one steadily producing mine, the Black Donald, in Renfrew county, within recent years, although others have been worked from time to time to appreciably increase the output in Ontario. These others include such as the McConnell mine near Perth, and the Allenhurst, in Denbigh township, a few miles east of the Black Donald mine. The ore of the Black Donald occurs as a vein in crystalline limestone of Archean age, its width gradually increasing from 15 feet at one end to 26 feet at the other underground face 400 feet distant. Its carbon content averages about 65 per cent., composed of the amorphous and the flake or crystalline varieties in the proportions of 45 per cent. and 20 per cent. respectively of the whole vein filling. All of the amorphous running 50 per cent. or over of carbon is sorted out and shipped in the crude state to be ground up elsewhere for a foundry facing product, while the remainder down to a 10 per cent. or 15 per cent. material is refined in a mill at the mine into nine grades of flake, mixed flake and amorphous (finer), and amorphous (finest), these ranging in purity from 96 per cent. down to 54 per cent. respectively. A developed water power on the Madawaska River, with electric power transmission to the mine and works, allows of economic operation.

The Allenhurst ore is similar in character to the Black Donald, while that of the McConnell is entirely flake. Throughout these counties of Renfrew, Addington, Frontenac and Lanark are numerous other occurrences of the mineral, some of which with their small amount of development already give prospect of becoming paying mines. The deposits across the Ottawa River, in Quebec, produce only flake and crystalline graphite, which, while forming the most valuable variety for use in the manufacture of crucibles, is too expensive for foundry facings, paint, stove polish and other such purposes where extreme purity is not essential. The Ontario amorphous deposits therefore supply a large market.

MICA MINES.

Previous to the year 1896 mica was obtained in Ontario almost entirely as a by-product from the mining of apatite or phosphate, the average yearly output amounting to considerably less than 100 tons. Between then and 1898 the relative importance in these deposits of the two associated minerals became gradually reversed, owing to extraneous conditions, such as, on the one hand, the opening up of many other much larger and more cheaply workable phosphate mines in the Carolinas and Florida, and, on the other hand, the utilization on a greatly increased scale of mica, as an insulator in electrical machines and apparatus, this latter mainly the result of the invention of the more generally applicable micanite or built up mica board.

The yearly production of mica reported to the Bureau of Mines is at best only a fairly close approximation of the actual output, because of the difficulty of getting at the numerous small and unpretentious operators, such as farmers who work their little pits during spare days. In 1899, however, the figures showed a rise to 266 tons mica for the year, worth \$38,000. In 1900 the output was 643 tons, worth \$91,750, and in 1903 was 948 tons worth \$102,205. The number of mines in operation in any one year is about 15, of which one, the

* Paper read at the Sixth Annual Meeting of the Canadian Mining Institute.

12) Bur. Mines, Vols. VII. and VIII.: Geol. Survey of Canada, Reports

Lacey, at Sydenham, raised in 1903 about 65 per cent. of the yearly product, with but 45 or 50 men on the pay roll. The mica in this mine occurs in places almost massive and in extraordinary large crystals. Dimensions of five feet across the face by a proportionate depth are not uncommon, while one measured nine feet across. One such crystal, three feet by five feet face by four feet thick, contains 60 cubic feet and will weigh about ten thousand pounds, at least half of which in a good crystal will form marketable mica, and at a rough average of twenty cents a pound will be worth one thousand dollars. Great skill is required in drilling and blasting out the mica in order not to seriously damage the crystals. Out of the rough mica raised from the mine only twenty-five per cent. or thereabouts reaches the market, the remaining seventy-five per cent. going to waste in the various trimming processes, where the flawed (fissure or spotted, etc.) portions are removed.

The geologic occurrence of the mica is described in a number of publications (13). The crystals lie embedded in irregular dikes of pyroxene with or without associated calcite, the pyroxene penetrating the granite or gneiss country. The mica-bearing portion of the pyroxene forms a chimney or chute most frequently, but when, as is occasionally the case, it is more veinlike, it has no great continuity and generally is definitely determinable as an elongated lens. For this reason few of the mines have attained imposing size, being simply open pits, or extensions down of the same subsequently timbered over and worked as a large irregular shaft. The deepest mine is the Stoness, in Loughboro township, where such a shaft was sunk 425 feet, having an average cross-section of about 20 feet by 30 feet, and an incline of 25 degrees from the horizontal. The Pike Lake mine, practically the only one from which white mica or muscovite has been produced, was worked as an immense quarry three or four hundred feet in length by two-thirds this in width and about sixty feet deep, the merchantable sized mica occurring throughout a dike of pyroxene in numerous chimneys or large pockets.

Most of the mica is of the amber variety, called phlogopite, and is equal to or better than any other found in the world for the purpose of electrical insulation. The product of these mines is trimmed in Ontario, some of the larger shops also splitting for mica board, prior to shipment to the largest consumers, the General Electric Company and the Westinghouse Electric Company in the United States. A fair proportion is manufactured into the finished articles in this country, as at the Canadian General Electric Company's works and numerous smaller electrical supply concerns. At Montreal much of the scrap mica is used for making boiler covering.

The only other important mica fields are in the two Provinces of Bengal and Madras, in India, where in 1902 the production of mica was 1,095 short tons, against Canada's 1,560 tons or Ontario's 1,000 tons. In India 130 mines combined to raise the above tonnage, with the employment of 9,219 laborers, as against Ontario's 15 mines, employing 110 men. The total reported output for all countries in 1902 was 2,905 short tons, so that Ontario's contribution amounts to more than one-third.

The large mica crystals which formerly brought such fancy prices are now very little used. In fact, most of the product of the mine is cut down to the more generally applicable sizes of 1 by 3, 2 by 3 and 2 by 4 inches, for which the prices at the

mine are per pound about 7 to 9, 15 to 20 and 25 to 30 cents respectively. These sizes may then be turned into micaite or mica board.

OTHER MINES.

In addition to the foregoing mines there are a number of others of different minerals which deserve mention, although at the present time not a great deal more information can be supplemented to the existing accounts of the same in the recent Bureau of Mines reports and elsewhere. These consist of the mines of molybdenum, platinum, feldspar, gypsum, actinolite, talc and asbestos.

Two molybdenite deposits have been mined within the past two years, and from both ore of good quality raised. Previous to 1902, although molybdenum was known to occur in Ontario in numerous localities, particularly throughout the Archaean rocks of the eastern portion, no attempt had ever been made to test and mine the deposits. One of the important finds is near Norland, Victoria county, from which several tons of ore, unusually rich for this disseminated class of occurrence, were raised, in fact, $3\frac{1}{4}$ tons valued at \$400. The writer has had concentration tests made of it by the Haultain-Stovel oil process, at Nelson, B.C., with most satisfactory results, the flakes of molybdenite down to the finest particles being separated almost completely and cleanly from the gangue. The other property which has been worked lies near Tamworth, in Sheffield township, Addington county, and from it last fall a considerable tonnage of ore was raised, of which 85 tons, valued at \$1,275, were shipped to chemical manufacturers in the United States. This ore contained about two per cent. molybdenum. A certain amount of surface prospecting has progressed on some of the other occurrences, which completes the development in this vicinity.

The metal occurs as the sulphide molybdenite, in flakes of a size from the merest particle up to three and four inches across, and disseminated through a variety of igneous rocks such as gneiss, greenstones and pyroxene. Where the rock matrix weathers easily the molybdenite frequently decomposes to a yellowish oxide, which requires other means of separation than a mechanical process. Large flake molybdenite was reported recently to have been discovered in north-western Ontario in the Lac Suel area, but there, as elsewhere in this Province, in the disseminated state. In British Columbia and a few localities in the western States it, on the other hand, occurs in massive veins up to eight inches or so in width.

Platinum has been found in appreciable and mechanically separable quantities in but one place in Ontario, namely, at the Vermilion nickel mine, in Denison township, and there as a hitherto unknown compound of this and other metals of the same group (these last in very minor proportions) with arsenic. It has been given the formula $PtAs_2$, and the name sperrylite, and is obtained together with the gold by mechanical means from the decomposed mineralized norite or gabbro forming the surface of the nickeliferous pyrrhotite ore body. By analysis it contains platinum 52.57 per cent., arsenic 40.98 per cent., oxide of tin 4.62 per cent., and the remainder in antimony, rhodium, palladium and iron. This mine was re-opened about the first of this year by the owners, the Canadian Copper Company, and we may, therefore, expect to have an appreciable quantity of platinum added to the mineral production of the Province, either as the mineral sperrylite or later by separation as pure platinum from the nickel-copper mattes from the smelters. Most, if not all, of the other pyrrhotite ores of this nickel range contain a small percentage of plati-

(13) Reports Bur. Mines and Geol. Sur. of Can. ; and Can. Min. Inst., Vol. VII., "The Occurrences, Production and Uses of Mica."

num, probably in this state of combination as sperrylite, which is subsequently separated with the other precious metals in the final treatment or refining of the nickel-copper mattes obtained from smelting the ores.

A year or so ago platinum was reported to have been found in some of the eruptive rocks near Wabigoon, Rainy River district, but beyond a little surface mining and analysing of samples nothing much was accomplished in the way of opening up and determining the nature of the occurrence as to whether or not it is of commercial value.

The mining or rather quarrying of feldspar has extended to a number of other properties in the immediate vicinity of the pioneer mine, the Richardson, in Bedford township, north of Kingston. The newer workings give promise of also developing into large producers, the feldspar at most of them equalling that of the Richardson. Some are raising a white feldspar, but it appears to be quite suitable for the same purposes as the pink variety (microcline) in the manufacture of pottery and for glazing tiles and other enamelled ware. The production of this mineral has increased rapidly since it was first mined in the winter of 1900-1901, the output for 1903 from about five properties amounting to 15,296 tons worth \$20,046. This so far has all been shipped to pottery works in the United States.

The methods of mining are of the simplest, the rock being quarried in great masses onto the floor of the pits, there cobbled and sorted clean, and then raised by derrick either by horse or steam power. It is immediately hauled to the railway for shipment. Great care must be exercised after the feldspar leaves the pit that it be not contaminated with any foreign material, since this causes discoloration when it is fused and spoils it for pottery making.

Gypsum mining in Ontario is confined to the banks of the Grand River, near Paris, where the mineral occurs (14), filling irregular cracks in beds of shale of the Onondaga formation and constituting about fifteen per cent. of the material as mined. It is there manufactured into a fertilizer and into alabastine, "Paristone," and other wall preparations.

Vaster beds than these have been discovered (15) in the Devonian limestone of northern Ontario, near James Bay, outcropping along the Moose or Missanabie, the Abitibi, the French and other rivers, and appearing to indicate that one continuous bed or belt of the mineral passes from one to the other of all these showings. The gypsum occurs in them massive and practically clean of limestone over large areas. The lack, however, of any means of shipment to or from this distant locality has, of course, prohibited all attempt at mining. The Temiscaming & Northern Ontario Railway is rapidly creeping northwards, where in its ultimate extension to a seaport on James Bay it will pass over the deposits and be probably the first means of converting them into a merchantable mineral.

The actinolite and talc mines of Hastings county have worked along in a small way, but occasion no particular additional description in this paper. The James actinolite deposit at Actinolite has been producing and the mill grinding to a finished article for roofing material, etc., for the past twenty years or more.

The Henderson talc mine contains a mineral of excellent quality and purity, suitable for the most delicate toilet powders, etc. On account of its foliated structure it can, however,

only be used for crushing to powders and is, therefore, excluded from the market for such purposes as gas and acetylene burner tips which require the hard, massive variety.

In Hastings county, near Actinolite, a mine was opened last year for the production of short fibre asbestos, the formation in which the mineral occurs being the same as that of the actinolite mines, namely a blackish-green hornblende or amphibolite rock, often schistose in structure. A mill was erected for the separation of the asbestos fibre for use in the manufacture, from the best of it, of boiler covering, and from the remainder wall plaster. It is not as yet an extensive industry.

PERSONALS.

Major W. F. Van Buskirk, who died recently at Stratford, Ont., was formerly the City Engineer of Rossland, B.C.

Mr. Frank B. Smith, Inspector of Mines for the North-West Territories, has been paying a visit to Vancouver and Victoria.

Mr. Hugh Rose, lately at Rossland, B.C., is superintendent at the Tecoteles mine, in the Santa Barbara district, Mexico.

Mr. Edmund B. Kirby is on his way to Denver, and will proceed shortly to Goldfield, Nevada.

Mr. David Wilson, late Underground Superintendent of the C.N.P.C. Company's Carbonado Colliery, has been appointed to a position in the management of the Bankhead Collieries at Banff.

The firm of Pellew-Harvey, Bryant & Gilman, of Vancouver, have dissolved partnership. Mr. Bryant will carry on the assaying ore testing business under the name of C. M. Bryant & Co.; Mr. Gilman is to engage in practice as a mining engineer.

Mr. J. Obalski, Inspector of Mines for the Province of Quebec, has been appointed to take charge of the Dominion Exhibit which will be made at the Liege Exhibition next summer. This exhibition opens in May and closes in November. It is unusual in being held in the midst of metallurgical industries, and Mr. Obalski's appointment in charge of the Dominion's exhibit is a strong testimony to his ability.

Mr. Chas. A. Bramble, for the last four or five years in charge of the Advertising Department of the C.P.R., has resigned his position. Mr. Bramble is well known for his writings on outdoor sports and mountain scenery, and his knowledge of the West made his services particularly valuable to the Railway. It is understood that Mr. Bramble intends to devote himself to business on his own account in the future. He is succeeded by Mr. W. T. Robson, the former New York representative of the McLean Publishing Co.

Mr. John P. Cosgro, formerly mechanical superintendent of the War Eagle and Centre Star Mines at Rossland, has accepted an appointment with the Allis-Chalmers Co. of Chicago, which puts him in charge of all hoisting engine business. Mr. Cosgro's experience in Rossland and previous connection with the Anaconda Mining Company specially fit him for his new position.

The retirement of Mr. E. B. Kirby last month from the general management of the Centre Star and War Eagle Mines was made the occasion for several presentations and addresses from both mine employees and citizens of Rossland. At an informal meeting presided over by the Mayor of Rossland, Mr. Kirby was presented with a solid silver service and the good wishes of his fellow-members of the Rossland Board of Trade. In replying to the presentation, Mr. Kirby stated his belief that Rossland would be a great and lasting centre of mining activity, and that the big mines were now on a profit-earning basis.

Although resigning from the management of the companies named, Mr. Kirby has not entirely severed his connection with British Columbia, his professional connections requiring him to visit the province at intervals.

Dr. H. M. Ami, of the Geological Survey of Canada, was in Montreal during the first week of the month attending the sessions of the Canadian Mining Institute. Dr. Ami has been quoted frequently of late in eastern newspapers in consequence of his remarks concerning the probable existence of glacial drift carrying diamonds in the James Bay and Hudson Bay basins. The drift material south of the Great Lakes has already provided eight diamonds, but as to whether they will be found in valuable quantity, the Doctor thinks, remains, as yet, an open question.

(14) Bur. Mines, Vol. XII., p. 147.

(15) Bur. Mines, Vol. XIII.

In these days of labour strikes it is pleasing to note the cordial relations existing in some industrial enterprises in Canada. At a meeting of nearly 300 of the workmen employed by the Canadian Smelting Works at Trail last month, held to consider the proposed eight hour law introduced into the legislature of British Columbia, the following resolution was adopted by a large majority:—"Whereas, a bill has been introduced in the provincial legislature, providing for a maximum eight hours in smelters, which bill, if passed, will, in our opinion, have the effect of disturbing the existing pleasant relations between smelter employees here and the smelter management, and result either in a corresponding reduction in wages, or else in large labour disputes, and the closing of mines and smelters for an indefinite period, resulting in great financial loss to ourselves and the community generally; therefore, be it resolved, that we, the business men of Trail and employees of the Canadian Smelting Works, in mass meeting assembled, do petition the Government to avoid any legislation which may have the effect of bringing on these conditions."

BOOK NOTICES.

A Hand-Book of Commercial Law, by Mr. William Patterson, of the Montreal Bar, published by Mr. C. Theoret, 11 St. James Street, Montreal, has come to our table this month, and is a most valuable publication for people having business in the Province of Quebec. The common, or civil, law of Quebec is a modification of the Roman Justinian law, modified through French experience, and subsequently re-modified to adapt it to the necessities of the 18th and 19th centuries. To people experienced only in the law and practice of the English code, it presents many points for admiration, and several for perplexity, and the Review is free to say that this little Hand-Book gives a most admirable outline of the commercial laws in force in the Province of Quebec. It is valuable to all mining engineers, and mine managers who have to do with contracts made in that Province.

The essential principles governing commercial transactions in Quebec are clearly and simply put, so that the book is most valuable as a handy reference to lie on one's table throughout business hours. We can commend the publication very heartily to all our readers who have commercial transactions in the Province of Quebec.

Mining Share Market.

Lack of interest continues evident in mining stocks generally, the only Canadian companies in which the public is now disposed to invest being Granby Smelter and Montreal & Boston, and this demand is entirely from Boston and New York. Industrials are more active, and speculation in them is broadening out; all show considerable advances over last month, except Nova Scotia Steel, which is adversely affected by the rumor that the dividend will be passed.

The following list shows the quotations for the week ending Monday, March 13, as supplied to the Review by Robert Meredith & Co., 57 St. Francois Xavier Street, Montreal:—

Par value of shares.		Asked.	Bid.
.10	Canadian Gold Fields Syndicate.. . . .	.05	.04
5.00	Cariboo Hydraulic.. . . .	—	—
1.00	Centre Star.. . . .	.23	.21
1.00	Deer Trail Consolidated.. . . .	.02	—
1.00	Giant.. . . .	.03½	.01
10.00	Granby Consolidated.. . . .	.06¼	.06
10.00	Montreal and Boston.. . . .	.01 1-16	.01
1.00	North Star.. . . .	.02	—
1.00	Payne.. . . .	.02	.01
1.00	Rambler Cariboo.. . . .	.15	.12
1.00	Republic.. . . .	.03½	—
1.00	St. Eugene.. . . .	.45	.40
1.00	War Eagle.. . . .	.13	.11
1.00	White Bear.. . . .	.04	—
100.00	Nova Scotia Steel (common).. . . .	62%	.62
100.00	Ditto ditto (preferred)	—	—
100.00	Dominion Coal (common).. . . .	.73¼	.73
100.00	Ditto ditto (preferred)	—	—
100.00	Dominion Iron and Steel (common).. . . .	.23¼	.23
100.00	Ditto ditto ditto (preferred) . . . . .	.74	.73½
—	Ditto ditto ditto (bonds). . . . .	.84½	.84¼

INDUSTRIAL NOTES.

The Dominion Coal Company is increasing its lighting plant at International Pier, and will install two sixty power Robb-Mumford boilers and a seventy-five horse power Robb-Armstrong engine.

The Cape Breton Electric Company has ordered a 150 horse power engine from the Robb Engineering Company, to increase the capacity of its North Sydney power station.

The annual general meeting of the shareholders of the Dominion Wire Rope Co., Ltd., was held at the head offices of the Company in Montreal, on the 16th February. The following officers were elected for the ensuing year: President, F. W. Fairman; Vice-President, and Managing Director, F. H. Hopkins; Secretary and Treasurer, J. J. Rosevear.

The Robb Engineering Company, Ltd., of Amherst, N.S., has established a branch works at South Framingham, Mass., where it will manufacture its special Mumford boiler and the Robb-Armstrong engine for United States customers. The plant taken over at South Framingham covers nine acres, and is well equipped with machinery, tools, etc., etc.

The Fairbanks Company, known in the United States as the Fairbanks-Morse Company, has been converted into a corporation known as the Canadian Fairbanks Co., Ltd., and will have its own plant in Montreal for the manufacture of the standard machinery of the Fairbanks Company. The purchase by the Canadian Fairbanks Co. Ltd., includes all the selling agencies of the Fairbanks Co. throughout Canada.

The Allis-Chalmers-Bullock, Ltd., of Montreal, have appointed Mr. Wm. M. Moran, as their general sales agent for the Maritime Provinces, with his office at Halifax. Mr. Moran graduated from Washington University with the degree of mechanical engineer, and has been engaged in electrical and railway work for the last fifteen years. He was formerly with the Brush Electric Company, the Edison Electric Company, and Townsend & Reid of Chicago, which firm is one of the largest railway contracting firms in the United States.

There has been considerable renewal of activity in mining operations in Central Ontario recently, and many of the companies have made large increases in their plants. The Kingston Felspar Mining Co., at Bedford, purchased from Allis-Chalmers-Bullock, Limited, Montreal, a hoisting plant, including a 30 h.p. double cylinder Lidgerwood engine; James Richardson & Sons, zinc miners, Mountain Grove, purchased an Ingersoll-Sergeant air compressing plant and the Madoc Mining Co., at Tweed, purchased a complete mining plant, consisting of a horizontal return tubular boiler, Ingersoll-Sergeant air compressor, Lidgerwood hoisting engine, etc., both from Allis-Chalmers-Bullock, Limited, Montreal.

The Manufacturers' Advertising Bureau, 126 Liberty street, N. Y. City, has found the past year to be marked by the same steady growth of business which has characterized its history for many years.

There is a demand for a Bureau of this kind which offers a real help to busy manufacturers in taking charge of the advertising end of their business, and giving to it the care and attention necessary to make the investment a profitable and satisfactory one.

Mr. Benj. R. Western, proprietor, established the Manufacturers' Advertising Bureau in 1879.

The Bureau is regarded as headquarters for reliable information regarding trade journal advertising.

The Westinghouse Companies have taken an order for the equipment of a power house to operate gold dredgers on the Alaskan rivers.

The Canadian Klondike Mining Company (Detroit), has given the order to install a 400 kilowatt turbo-generator in the power house, to be driven by a 600 horse power Westinghouse-Parsons steam turbine. The dredges are to be built by the Marion Steam Shovel Company, of Marion, Ohio, the machinery of which will be driven by induction motors, aggregating a total of about 500 horse power, and varying in size from 7 1-2 to 100 horse power.

The power house will be at Dawson City, and the dredges will operate on the Yukon River and its tributaries. Lines for transmitting power will be strung from the station to the boats, wherever they may be working.

MINING NOTES.

NEWFOUNDLAND.

Captain John Stewart has had ten men at work during the winter on a property at Mings Bight, Nfld., and the quartz mined has shown good gold values, a portion of which is free milling, and the balance is contained in the sulphurets which are found in the quartz. The property is understood to be owned by a small syndicate, which claims to have received a small bar of gold as the result of the winter operations.

NEW BRUNSWICK.

The Electrical Manganese Co., officered by Mr. B. E. Kingman, of New York, and Mr. Frederick Sayles, of Providence, R.I., are developing a large electric power plant near Campbellton, N.B. It is the intention of the Corporation to manufacture ferro-manganese, to generate electricity for the operation of the pulp and saw mills in the vicinity, and to transmit electric power to the St. John River Valley to be used for lighting and manufacturing. The Corporation has a large capital and declares its intention of spending between three and four millions of dollars in the development of its schemes. Work will be begun early this present summer.

NOVA SCOTIA.

The February shipments from the collieries of the Cumberland Railway and Coal Co. amounted to 18,326 tons.

The Cape Breton Copper Co., Ltd., has sold at public auction the property known as the Coxheath Copper Mines in Cape Breton County.

The Dominion Coal Company shipped from Louisburg during February, 61,000 tons, or nearly one-half of the total shipments made during the month.

The Dominion Coal Co. are planning to mine 3,500,000 tons during the year 1905; of this amount 1,250,000 tons have already been placed in the St. Lawrence market.

A sudden run in the large stock pile of iron ore at Sydney furnaces buried three workmen on the 3rd of March, but fortunately none of them were seriously injured. The accident was caused by a cave-in, the unfrozen ore below the frozen surface having been dug out.

On appeal from the finding of the trial judge, the Lakeview gold mining property at Waverley, Halifax County, has been awarded to A. A. Hayward, et al. This decision is understood to be final.

The Dominion Iron and Steel Co. expect to be rolling rails in June. The recent heavy storms in Nova Scotia have delayed construction work, the materials needed being stalled in snow drifts along the various lines of railway.

The old Dufferin Gold Mine is reported likely to commence work again; contracts for fuel have been let and machinery is now being overhauled preparatory to starting operations. The name of the new corporation has not been disclosed.

One hundred and fifty mining acres at Clam Harbor, Halifax County, have been purchased by some capitalists from the State of Maine, who will erect a small stamp mill and operate the mine during the coming summer. The corporation is a private one.

The well known Joggins Mines, the property of the Canada Coal & Railway Co., was sold at sheriff's sale this month on behalf of the bondholders, for the sum of \$50,500. The timber land, covering something like 1,900 acres, was sold for \$550. The purchaser was Mr. Stuart Jenckes, and it is believed that Mr. Jencks is simply acting on behalf of a syndicate which is prepared to undertake the reconstruction and re-financing of the property.

The Nova Scotia Mexican Mining Co., owning property at Goldenville, is again in trouble, and attachments for \$1,112 have been issued against it by Geo. W. Stuart, for moneys advanced to the company. The Goldenville property of this company is an extremely valuable one, but the property has suffered for the last ten years through deficiency of funds to work it, and through the most ill-advised business management. It is to be hoped that, sooner or later, the property will be developed in a manner which its holdings justify.

The Cape Breton Coal, Iron & Railway Company have appointed Mr. P. F. Thomas, of London, England, as resident manager for the corporation. The Company is now using three mining machines, and will add more in the spring; two slopes have been sunk, and work on the third is progressing rapidly. It is proposed to operate seven slopes when the mine has been put in full running order. The railway from Broughton will connect with the Sydney and Lewisburg Railway at a distance of about two miles from the main land.

The Dominion Coal Co. is making important improvements to its shipping piers. The Canadian General Electric Co. has been given a contract to supply a power house and apparatus at the piers for lighting the same and furnishing power for winches, etc. The loading chutes, hitherto operated hand winches, will hereafter be worked by Denton hoists, reducing the time from 20 minutes per chute handled to about one minute. The improvements projected will appreciably reduce costs as well as save much time.

Some well known Halifax men have incorporated under the Nova Scotia Joint Stock Company's Act a corporation to be known as The Shipbuilding and Investment Company. The corporation has secured

a property on the Dartmouth side of Halifax Harbor having a water frontage of 1,000 feet and a good depth, and including nearly 50 acres of ground. The site has deep water along its frontage, and has an admirable location. The directors of the company are Mr. Geo. S. Campbell, Mr. Geo. Stairs, Mr. John Longard, Mr. B. F. Pearson, and Mr. J. A. Johnson, with Mr. Hunter, of Swan & Hunter, Newcastle-on-Tyne. In this connection it may be noted that an English paper advises the Dominion Government has promised a bounty of \$6 a ton on steel ships built in Canada, but Ottawa refuses to confirm this report.

The St. Lawrence Coal Co.'s property is situated on the Little Bras d'Or, four miles from North Sydney, and adjoining the property of the Nova Scotia Steel and Coal Co. The company believes it has a total available tonnage of 20 millions. The colliery is to be opened for a capacity of 500 to 1,000 tons a day and will, for this purpose, utilize a slope on the Collins seam and extending to the southern limits of the area. It is proposed to run levels on this seam and raise the coal through the slope for the market. The company hopes to be able to put coal from the Collins seam on the market this season.

ONTARIO.

The James Bay Railway is to start at Copper Cliff and run north-erly; survey parties are already in the field.

The second clean-up of the mill on the Steel Mine at Sturgeon Lake is reported to have been \$3,500.

English capital has been enlisted in the support of several mineral properties in Hutton Township and the Temagami district.

Messrs. J. A. Jacobs and Milton L. Hersey, of Montreal, have been examining some cobalt properties near Halleybury.

It is reported (on the authority of Mr. F. S. Clergue), that the Gertrude and Elsie mines will be re-opened about April 1st.

During February the Williams Mine shipped to the Algoma Steel Works iron ore of Bessemer quality at the rate of 35 tons a day.

The first test run of the five-stamp mill on the Shakespere property amounted to \$2,326, giving a value of \$23.65 to each ton milled.

The C.P.R. will transport from Liverpool to Sault Ste. Marie the 10,000 tons of spiegel iron purchased in England for the Algoma Steel Company.

The output of the new smelter at Copper Cliff is expected to be larger this month than it has ever been; all departments have been working most satisfactorily.

The Temiscamingue and Northern Railway, owned and operated by the Ontario Government, is already being operated at a profit. It is reported that the net earnings during February averaged \$500 per week.

The International Nickel Company will drive their blowing engines by electric motors. Three of these, of 500 horse power each, have been ordered from the Allis-Chalmers-Bullock Company. The power is to come from the High Falls generators.

Morrisburg, Ontario, is to have a steel plate and iron works which will be financed by an American company. The mover in the matter is a Mr. Wm. J. Allison, of New York City, who has been an employee and associate of the Vanderbilts for many years.

The operations at the Big Master mine at Gold Rock have been delayed through the financial embarrassment of the company and the legal tribulations of Mr. Meyers, but recent advices say that funds have been secured and that active operations may be resumed in April.

The Lake Superior Company proposes to complete the Algoma Central Railway this year. One hundred and twenty-five miles of the road are already complete in every respect, and another one hundred miles is graded and ready for track laying; there remain twenty-five miles to be graded and ironed.

The rail mill of the Lake Superior Corporation at Sault Ste. Marie, has made a new record by blowing 93 heats in 12 hours, or a total of 362 tons in half a day. This is at the rate of 742 tons of steel rails in 24 hours, and when it is remembered that the capacity of the plant was figured for 500 tons a day, this increase of 50 per cent. over the nominal capacity is remarkable.

There appear to be good chances for a revival of operations in the Lake of the Woods section. The Black Eagle will resume operations under the personal direction of General Sir Henry Wilkinson at once. Reports says that funds for the re-opening of the Bully Boy are available, and that the Olympia mine will start its mill this spring. The work at the Sultana continues to yield profitable ore. The Mikado, however, is advertised for sale by the branch of the Imperial Bank at Rat Portage.

The property of the Mikado Gold Mines in the Lake of the Woods District has been advertised for sale by tender at the instance of the Imperial Bank of Canada. The property includes about 300 acres on which three gold veins have been proved. The total production of this property during the long time that it has been worked has been about \$500,000 in gold, but no earned dividend was ever made. From the advertising made by the company it is evident that the present corporation will consider propositions looking to a tender of cash and shares in a company to succeed the present one.

The Atikokan Iron Company has been organized with a capital of \$1,000,000, for the purpose of mining iron ore, and manufacturing iron and steel at Port Arthur, Ontario. This company has been fathered and organized by Messrs. McKenzie and Mann, of the Canadian Northern Railway. The town of Port Arthur has become interested in the company by furnishing a site of 40 acres for the plant. The company proposes to erect a 100 ton furnace this season. It will probably be supplemented by a secondary corporation to be known as the Canadian Coal and Ore Dock Co., which will construct fuel and ore docks of a capacity of 200,000 tons of coal and 100,000 tons of ore. The proposed capital of this supplementary company will be \$500,000.

In the suit of Barron vs. Meyers, Judge Tappin has given judgment in favor of Barron and against Meyers. This suit was taken in connection with the well known properties which have been included in the Big Master Mining Co. and the Interstate Consolidated Co. Mr. Meyers has also been arrested in connection with the same properties by plea of another plaintiff called Bollenstein, who made a note in favor of Meyers, receiving therefor 20,000 shares of Jubilee mine stock and 2,000 shares of Big Master stock. M. A. Meyers will be remembered as the promoter from Warren, Pa., who first came into prominence in connection with transactions relating to the Port Arthur silver mines, and who afterwards engaged in the flotation of gold properties in the Manitou and Rat Portage districts. His methods have not met with the approval of the Courts.

BRITISH COLUMBIA.

The Payne mill has been started up by the lessees on ore taken from No. 8 tunnel.

The Mohican silver-lead mine on Gainer Creek, Lardeau District, is driving a long cross-cut to reach a large ore body shown on the surface.

The Eva Mill, Camborne District, is steadily crushing quartz from the Eva Mine, since the completion of the tramway from the upper levels to the ore bins at the head terminal of the main tramway.

The shipments of zinc ore from Kaslo during the week ending the 5th of March totalled 560 tons, while the shipments of silver-lead ore sent out were only 75 tons.

The Copper King property, on the west coast of Texada Island, announces that it has struck a vein of solid bornite four feet in thickness at a depth of 30 feet. No further particulars are given.

The Le Roi experimental concentrator is expected to be in operation by the first of May, and will have a capacity of 10 tons per diem. The total shipments from Rossland District to the 5th of March amounted to 60,936 tons.

Mr. M. M. Johnson of Salt Lake City, has been making an examination of the Montreal and Boston mining properties for a New York lawyer, Mr. Samuel Untermyer, on behalf of the well known mining and metallurgical firm of the Guggenheims.

The strike of the miners of the International Coal & Coke Co. at Coleman, is still on, and it is reported that the miners are simply using this strike as a feeler to find out the strength of the different coal corporations before extending the strike to other coal companies in the Crow's Nest field.

The Empress group of claims on Howe Sound, in which Mr. O. Furry has a 50 per cent. interest, Mr. G. H. Robinson a 35 per cent. interest, and the Boscowitz Estate a 15 per cent. interest, is understood to have been optioned, as to a half interest, to a New York gentleman, for the sum of \$75,000.

The Executive of the British Columbia Mining Association held a meeting at the Driad Hotel, Victoria, on the 20th of February, and made arrangements and a programme for the annual meeting of the Association, which is to be held this year in Vancouver during the last week of July.

It is reported from Nelson that the Bank of Montreal is again in negotiation with Americans for the sale or lease of the Bluebell Mine and the Pilot Bay smelter. The Bank, while admitting that inquiries have been made, says that nothing definite has been done.

Promising copper deposits have been found in the Highland Valley district, some five miles from Ashcroft Station, on the C.P.R. There is peacock copper on the surface, and the work done to obtain Crown grants has shown a large quantity of merchantable ore. The claims are owned by Messrs. Curtis, Sword, Knight and Hoskins.

The assets of the Winnipeg Mines, Ltd., were sold by the Judge of the County Court at Grand Forks, so as to satisfy labor liens against the property. The property was bid in by Mr. W. T. Hunter for the sum of \$2,500. As the court expenses amounted to about \$160, there will be \$2,340 left to satisfy an aggregate of \$3,400 in liens.

The furnace of the Sullivan Mining Company at Maryville, East Kootenay, is ready to blow in, and the second furnace is supposed to be ready on the 15th of March. This plant, it may be remembered, is equipped with the new Heberlein converter, which has been experimentally tried by the American Smelting and Refining Company at its Pueblo plant.

The first week in March opened with the blowing in of the sixth furnace of the Granby Smelter, and all three of the smelters in the Boundary Country are now in full operation. This makes a total of 19 blast furnaces in operation on the 4th of March. At the present time the tonnage of the three smelting plants amounts to over 20,000 per week.

The Arlington Mine, at Erie, received for the shipments made in January to the Hail Mining & Smelting Co., at Nelson, a gross value of 404.73 ozs. of gold, 771 ozs. of silver, and 8,372 lbs. of lead, the approximate value of which was \$8,800. The amount of ore shipped was 129.4 tons, giving an average value of nearly \$67 per ton.

From items coming to our notice from Prince Albert, N.W.T., dredging is again to be attempted upon the Saskatchewan River. The Saskatchewan Mining and Development Co. are putting in a large dredge at a cost of \$60,000. It will be placed upon the river in the Spring, and another attempt will be made to dredge the sands of the Basin for the gold and platinum contents which they are known to contain.

The French Creek Mining Company, on French Creek, in the Big Bend District, Revelstoke Division, has been acquired by an Indiana outfit, which will repair the headgates, flumes and ditches, and endeavor to get to work hydraulicing at an early date in the Spring. Mr. E. A. Bradley is Superintendent. The richness of the French Creek slope of the hill has been known for many years, but intelligent management has not heretofore been employed.

The St. Eugene Consolidated Mining Co., Ltd., has declared another dividend of two per cent., making a second quarterly dividend of this amount. The two per cent. dividend means the distribution of \$70,000 to the shareholders, which may be considered a very satisfactory return on the investment. The mine is now producing about 2,500 tons of concentrates each month, which are being shipped to the smelters at Trail and Nelson.

The preliminary announcement by the Provincial Mineralogist of the approximate values of the mineral output of British Columbia for 1904 shows that in spite of rumors of business inactivity in that province, the growth of the mining industry is steady, and has substantially progressed since 1903; the largest increase is that in coal (\$1,500,000), lead (\$750,000), and coke (\$534,000). Out of a total gain of \$3,600,000, more than \$2,000,000 of that sum was due to increased shipments of coal and coke.

The Executive of the British Columbia Mining Association has passed a resolution asking the Provincial Government to have its assistance in the matter of investigating the taxation of mines, and requesting that the managers, or those operating mines in the province be asked to furnish information respecting the number of tons shipped during 1904; the total revenue from the sale of products, pay-roll at mine, pay-roll at mill, pay-roll at smelter, supplies at mine, supplies at mill, supplies at smelter, official and general expenses, transportation costs to mill, to shipping points, or to smelter.

The B.C. Bureau of Information has issued in pamphlet form the report of Mr. J. H. Gray, civil engineer, on the Bulkley Valley country. He reports that in the valley of the Telqua River, (nearly 60 miles from Hazelton, several seams of a good quality of bituminous coal have been proved, and reports that some 75 square miles have been applied for by coal mining or development companies. Concerning the copper-gold claims reported in that section, Mr. Gray admits that, until transportation facilities are provided, no development can be expected. He further reports that road-making and communications are somewhat difficult.

The Hall Mining & Smelting Co. Ltd., has installed a new roasting furnace at Nelson which is the invention of an Australian, Mr. T. D. Merton, by name. This furnace has been used for roasting gold ores in Australia, preliminary to treatment by chlorination and cyanide, and it has also been adopted in some Australian smelting works. The furnace occupies a floor space of 9 feet by 35 feet; it has three decks or floors within the body of the furnace and one exterior half. Its advantages, it is claimed, are that the mechanism of the rrabbling is of such a character as to turn over every particle of ore in each revolution. The reports from Queensland smelting works are very satisfactory.

Mr. F. H. Sherman, President of District 18 of the United Mine Workers of America, in a communication to the Nelson News, under date of March 1st, points out that, in the year 1903, the fatalities in the Crow's Nest Pass field were doubly those of the competitive states of Washington and Montana, and nearly three times as great as in the States of Pennsylvania, West Virginia, and Illinois. Mr. Sherman makes this statement his reason, or his excuse, for the statement that the United Mine Workers are endeavoring to keep unskilled labor out of the mines, and to increase the quality of the men whom it permits in mines. Incidentally, the statement is a claim for higher wages.

YUKON.

There are many good sized dumps on Hunker in the neighborhood of Hester Creek; from 45 to 60 below are the largest dumps on the creek.

During February operations on Hunker Creek were much hindered by an unusual flow of underground water, which is now reported to have slackened.

Glacier Creek has hitherto had only a summer post detachment of N.W.M. police, but beginning March 1st, a permanent patrol of police will be located there.

Big Gold Creek, a tributary of Sixty-mile River in the Glacier District, reports the finding of coarse gold and gravel worth 75c to the pan. The discoverers are Wm. Miller and Wm. Schofield.

Five hundred pounds of clean bornite were lately sent in to the Government Assay Office at Dawson from Lund and Lloyd's claims on White River. Assays of small samples have shown high values in gold.

It is reported that the property of the Canadian Klondike Placer Mining Co., which is located about 25 miles from Dawson, has made a strike of rich gravel. It is said that pans have shown \$100 a pan.

This winter there are 199 boilers at work on Dominion, Granville, Sulphur, and Gold Run Creeks. Their aggregate horse power amounts to 3,575, and the total horse power of the engines on the same creeks amounts to 796, leaving 2,779 h.p. as the amount available for thawing purposes.

The Yukon World is authority for the statement that Mr. A. J. Beaudette, Mining Engineer to the Territory, has discovered, on No. 8 Dominion Creek, the head of a huge mammoth (Mastodon giganteus). The rest of the mammoth is being carefully uncovered in the hope of obtaining a complete skeleton.

Yukon advices concerning the new Tanana district are not favorable. There is practically no gold dust in circulation, only legal tender. This report says that only 20 to 30 claims are working this winter. 15 on Cleary Creek, 5 on Fairbanks, and 3 on Pedro Creek. A large number of claims are being prospected, but are not producing the yellow metal. Out of over 5,000 men centering at Fairbanks, less than 1,000 have steady employment.

Reliable reports from Duncan Creek, Stewart River, indicate that the deep gravels of that district may occasion a production to rival the palmy days of Bonanza and El Dorado. No shaft has yet reached bedrock except on Hiatt Creek where the average depth to bottom is not over 20 feet. The deepest shaft on Duncan in February was 139 feet with no sign of bedrock. The water is very heavy and many shafts have been lost through flooding.

From reliable sources it is announced that coal of good quality will be plentiful in the Yukon during the present year. The Alaska Coal & Coke Co. have opened a seam at Royle's Landing at the mouth of Washington Creek, 40 miles below Eagle on the Yukon. This seam is of a good coking quality and is from 5 to 15 feet in thickness. The outcrop can be traced for 3 1-2 miles, and the seam dips sharply at an angle of about 45 deg.

The White Pass and Yukon Railway have given a contract for 5,000 tons to Capt. Miller, who is working the coal at Five Finger. All the White Pass boats are having their grates changed from wood to coal burners.

At Forty Mile the Williams Co have built a tramway (some twelve miles in length) from the mine to the bunkers, and are prepared to ship steadily when the river opens. The new shaft has now ten feet of clean coal opened. Besides these three shipping properties there is the Ames Mine, which is now reported to be free from litigation and which expects to ship coal before the close of the season.

With these collieries open, two above and two below Dawson, the days of wood at \$10 per cord, will come to a speedy end.

COAL NOTES.

NOVA SCOTIA.

In spite of the coal duty the Dominion Coal Co. is still disposing of from 700,000 to 800,000 tons annually in New England.

The annual meeting of the Intercolonial Coal Mining Co. was held in Montreal on the first day of March, when the report of the manager was submitted. The total output of coal and coke for the year ending December 31st, 1904, amounted to 269,689 tons. The old Board of Directors was elected, with Mr. Jas. Cleghorn as President, Mr. Chas. Fergie as Vice-President and General Manager, and Mr. D. Forbes Angus as Secretary and Treasurer.

The Nova Scotia Steel & Coal Co. attempted to hold a meeting in Montreal on the 2nd of March, but experienced difficulty in obtaining all the directors, owing to the recent heavy snowstorms which had occurred in Nova Scotia, and which had delayed all passenger trains and had thrown all shipments out of gear. It is understood that the meeting was not unanimous as to the declaration of a dividend on the common shares, and nothing was given out for publication.

The Dominion Coal Co. has chartered for the season of 1905 the Cattalone, Mystic, Dominion, Tordensjold, Tanored, Brittanic, Harrod, Ovidla, Smyra, and the James Ross, in addition to the Company's own fleet, which comprises the steamers Coban, Louisburg, Cape Breton, Bonavista and Cacouna. The steamer Turpin has been chartered to be used in the coast trade alone. The largest steamer of the fleet is the James Ross, which is now building at Middlesburg, England, and which will have a capacity of 7,000 tons of coal.

The Canadian Pacific Railway has been making experiments on one of its locomotives with the burning of the anthracite coal coming from its new colliery near Banff. So far as the tests have gone they have proved satisfactory, and it is probable that the Company will use anthracite coal to a very great extent on its western lines in the future. In this respect the C.P.R. is but following the example of the Lehigh Valley R.R., in running the Black Diamond express, which has been successfully in operation for several years as a fast train. Locomotives burning hard coal require to have a fire box built specially for the purpose, as the heat from the combustion with anthracite is greater than that from the combustion of soft coal.

In the month of February the Dominion Coal Co. put out a total of 128,778 tons of coal, and shipped 106,295 tons. The output from the collieries was respectively as follows:—

	Output.
Dominion No. 1	29,094
" No. 2	24,999
" No. 3	10,989
" No. 4	27,752
" No. 5	21,571
" No. 7	3,890
" No. 8 .....	.....
" No. 9	10,483
Total	128,778

The Dominion Coal Co. has finally decided to make an attempt to secure the markets of Toronto and Western Ontario for coal. In previous years Toronto, and other towns on Lake Ontario have been supplied by American coal companies, owing to ease of access by water routes across the Lake. The Coal Company's Directors think that this market should belong to Canadian coal companies, and will make an effort the coming season to secure it by employing a special class of boats to handle coal between Montreal and Toronto. The Company will also construct large coal pockets at Toronto, which will be used as the principal distributing centre for Ontario. A large number of contracts have been made in Toronto with some of the most prominent industrial concerns in that city, and other contracts have been made for the towns of Prescott, Brockville, Kingston, and places between Montreal and Toronto.

--- Presidential Address.

Delivered by EUGENE COSTE, E.M., at the Montreal Meeting, Mar. 12, 1905.

I take great pleasure in welcoming the members of the Canadian Mining Institute to this, our seventh Annual General Meeting.

That Canada is to-day already one of the great mining countries of the world is proved and admitted; that untold wealth of mineral resources still remain untouched in many parts of our vast undeveloped country is also fully recognized by our mining engineers and geologists, and by many others who have studied the question.

Could we not, all of us of the Canadian Mining Institute, the only incorporated Institute representing the mining men from the whole country, do more than we are doing to hasten a more rapid and healthy development and progress of this immense mineral wealth of Canada? I have no hesitation in saying yes; we can do much more, and it is our duty to do it; our duty to ourselves; our duty to our profession and industry; our duty to our great country. We are already a strong organization of nearly 500 members, and as I said last year, we have done a great deal in the past, but we can do and must do much more in the future.

Our country is now growing very rapidly,—millions of dollars are going to be spent in constructing railways through vast new stretches of our country, and many opportunities to open and develop new mining districts will thus be presented to all of us. Thus the problems confronting us in our mining profession and industry, whether scientific, economic, of legislation, of transportation, of treatment or of any other nature, will soon multiply even more rapidly, and we must be ready to creditably consider and solve all these problems and difficulties. Already our mining interests have expanded largely of late years; as an instance of it, we have this year on our programme not less than fifty papers, and it is impossible for us to give to all these papers the necessary attention and discussion at this meeting. We are outgrowing our old clothes and we must cut our next suit on larger and broader lines. Many of the mining problems of the future will no doubt be settled directly and individually by some of us, but we can only hope to successfully master all the many other questions and responsibilities which individual enterprise or energy alone will fail to solve or fulfill, by uniting still more firmly and on a broader basis. "Union is Strength," and in my opinion the time has come for the members of the Canadian Mining Institute to adopt the necessary changes in the Constitution and by-laws of the Institute which will bring about these results.

The constitution or by-laws of any institute or society is of course the final guide and mainstay of it, and once a provision or rule is adopted and placed there, the officers of that institute or society have then the necessary machinery to work with and the power to put this machinery into motion. It only remains for them to watch its work with zeal, care and intelligence.

These necessary changes or additions to our present machinery, as I propose them, will be found at length in the set of new by-laws, copies of which I have sent to every member, but briefly stated, they are:—

- (a) A larger representation of the members on our Board or Council of the Institute.
- (b) The formation of strong branches of the Institute in the different Provinces and in some of the important mining districts of the country.

Those who have taken an active part in the affairs of the Institute in the past are a unit, I believe, in admitting that it has been very often next to impossible to have a good representative meeting of the Board or Council of the Institute, as at present constituted. The most of these gentlemen are so far away that they can hardly ever attend Council meetings, and as at present organized, one half of our Council is practically unavailable to us, while on the other hand, the other half, is not the help to them we should be. This state of affairs is not broad enough and is not conducive to our acquiring a thorough knowledge of, or to our giving the necessary attention to, the many questions and problems affecting at all times the mining industries in the different provinces or districts of our vast country. Nor is it promoting the mutual help and intercourse among the members, which is one of the most important objects and mission of our Institute.

I submit, therefore, that in the best interests of the Institute we should now organize differently in order that in the future a good many more members from all over the country would in some way join the few who alone have acted in the past, and would become in common with them active thinkers, advisers and managers in all the affairs and objects of the Institute.

It will readily be seen that the above proposed changes or additions to our by-laws will accomplish this, not only by enabling more of us to meet in Council in Montreal, Toronto, and other places in the central part of the country, as often as necessary, but also by the means of the branches we will be in constant communication and interchange of ideas with many of our distant members. These in the meetings of their branches, which can be held several times a year if necessary, will bring up and discuss all the interesting subjects connected in

any way with their local mining interests and industries, and their chairmen, secretaries, and full organizations will always be in touch with the central organization. Thereby the necessary activity and life will run through the Canadian Mining Institute from the Yukon to Cape Breton, together with the necessary spirit of mutual help and unanimity of purpose so necessary to permanent achievements.

As I expect that this subject will be fully discussed at another one of our sessions, it is unnecessary for me to refer to it now at greater length, but permit me in closing these few remarks, on this important matter, to give you an instance of what other Canadians have done with a similar organization to the one I advocate for the Greater Canadian Mining Institute. I refer to the Canadian Manufacturers' Association.

Mr. Coste then gave a summary of the growth and organization of the Manufacturers' Association, and declared the Sessions of the Seventh Annual Meeting open for the reading and discussion of the papers presented.

The Dominion Coal Company's Report.

The annual report of the Dominion Coal Co. was submitted to the general meeting held on the second day of March, 1905. The Directors' Report notes that the tonnage for 1904 was 124,244 tons less than for 1903, which deficiency is ascribed to the strike which occurred in mid-summer among the Dominion Iron & Steel Co.'s employees. The net earnings for the year were \$135,548 less than in 1903, which is accounted for chiefly by the increased cost of production during the first six months of the year. The passing of the dividend on the common stock is explained as sanctioned by the directors owing to their belief that it was better to apply the net earnings to pay for the improvements and expenditures necessitated by the opening of new mines, rather than to increase the floating debt of the Company for that purpose.

The chief improvements of the year were the opening of Dominion No. 6 on the Phelan seam and its connection with the main line of the Company's railway by a branch line six miles in length. A new water supply system has also been installed, obviating the occasional shut-downs due to dry seasons in summer and severe weather in winter. The total amount expended on capital account during the year was \$500,487.98, of which amount \$260,000 was provided for by securities of the Cape Breton Real Estate Company and the Dominion Rolling Stock Company; all other expenses were charged against operations during the year. First mortgage bonds amounting to \$116,000, and a floating indebtedness of \$469,118 were discharged, but new debentures were issued for new buildings and new rolling stock to the amount of \$198,546.69, making a net decrease of liabilities to \$368,571.38. The net increase in the assets of the Company amounted to \$503,766.90. The directors' reply to the question of retiring the present bonds and preferred stock in favour of one class of securities was deferred until the return of better conditions, and until the financial markets are more buoyant than during the past year. During the year Mr. Emerson Bainbridge and Mr. Geo. B. Walker, of Great Britain, were employed by President Ross to make a thorough inspection of the mines and properties; methods of operation, etc., and their report is not published to the shareholders but is summarized briefly. This summary contains nothing of technical interest to the readers of the Review, and nothing which our readers did not know beforehand; the reason for the employment of these experts is not made apparent. The facts that the Coal Company possesses properties of great value, containing immense quantities of coal, advantageously situated, were well known to every person of ordinary intelligence beforehand, but the Directorate have seen fit to only publish 15 or 16 lines from the report of these authorities, which lines contain nothing that was not known thoroughly before, and nothing which is of any importance to the shareholders.

Eighth Report War Eagle Consolidated Mining Company.

In this report the Financial Statement shows assets, \$2,308,151.61 if the valuation of the claims is admitted; this valuation is put at \$1,699,329.39. The amount of stores on hand is put at \$10,335.50; accounts receivable, \$25,898.58; cash on hand, \$39,236, and the profit and loss statement is \$237,822.75. The over draft on the Bank of Toronto at Rossland amounts to \$96,378.60; the present indebtedness to Mr. Geo. Gooderham, \$451,667.44 and accounts payable to \$10,050. No mention is made in the report of the success or failure of the Rossland Power Company's mill, and neither President Gooderham's nor Manager Kirby's report gives any information of particular value to shareholders. The assay value of the ore shipped during the year (amounting to 56,760 tons) is given as \$12.18 against \$13.00 for 1903. The reserves are put at the small figure of 23,000 tons, showing a value of only \$8.50. The smelters gross assay value up to the end of the year resulted, as usual, in an excess of expenses over receipts. The noteworthy item of the whole report is that the cost of winning the ore has been reduced to \$2.24 and the total cost of mining, including development work, down to \$3.00 per ton. We are firmly of the belief that the sooner the War Eagle is closed down, the better it will be for the shareholders, especially the better it will be for Mr. Geo. Gooderham's private bank account.

Digest of Recent Patents; Mining and Metallurgical.

CANADIAN.

- Feb. 7, 1905.
- 782,124.—Method of Converting Matte. Oliver S. Garretson, Buffalo, N.Y., assignor to Garretson Furnace Company, Pittsburg, Pa., a corporation of West Virginia. A method which consists in converting matte by a blast underneath a column of material containing a flux, removing the slag, allowing the matte accompanying the slag to settle, removing the superincumbent slag, practically free from matte, exposing the slag to heat, which sweeps over the surface of the slag and keeps the slag in a freely-flowing condition, and intermittently adding sulfur-bearing material to the slag for producing a low-grade matte, which combines with any values contained in the slag.
- 781,807.—Process of Smelting Native-Copper-Bearing Rock. Franklin R. Carpenter, Denver, Colo. A process which consists in adding thereto basic material, to form a slag and a sulfid material to form a matte or carrier for the native copper, and, incidentally, the gold and silver that may be present and smelting the mixture.
- 782,078.—Ore Concentrator. Albert H. Stebbins, Little Rock, Ark. The combination of a frame, a concentrating surface supported by said frame, a series of concentrate-guides disposed diagonally over the concentrate-surface, a series of tailing-guides disposed above the concentrate-guides, said concentrate and tailing guides being arranged at an angle to each other, the concentrating surface being formed of sheet material having perforations therein, the walls of which are offset to direct fluid-currents over or substantially parallel to the said surface.
- 781,834.—Metallurgical Furnace. Richard L. Lloyd and Peter Thill, Greatfalls, Mont. The combination of a hearth forming a continuous longitudinally-curved path for the ore, extending from the mouth to the discharge of the furnace, and disposed about a vertical axis, reciprocating feeding mechanism, means for causing it to follow the curve of the hearth in feeding the ore, and means for withdrawing it from contact with the ore during its backward stroke.
- 782,145.—Process of Producing Pure Copper. Louis M. LaFontaine, Paris, France. A process which consists in forming the copper-producing ores into suitable plates for anodes without previously treating the ores, and subjecting said plates to an electrolytic bath whereby an electric current causes dissolution of the copper in said plates and transfers it to the cathodes of the cell.
- 782,425.—Gold-Separating Machine. Fred. C. Stevenson and Charles E. Heft, Grants Pass, Oreg., assignors of one-half to George W. Sanford, Honeyoye Falls, and Charles M. Smith, Marion, N.Y. An inner cylinder mounted upon a shaft, an outer cylinder mounted upon independent bearings, a train of gear-wheels connecting the cylinders to revolve them in opposite directions and at different speeds, annular ribs within the outer cylinder, the inner cylinder divided longitudinally and perforated, and a hopper and screen connected therewith.
- 782,264.—Machine for Crushing Ores or Other Uses. David J. Nevill, Salt Lake City, Utah. The combination with a pair of rolls and a movable bearing at each end of one of said rolls, of a spring for each of said bearings, two pressure-plates which are independently movable and between which the spring is supported, and means for transmitting the movement of the bearings in one direction to one of the plates, and means for transmitting the movement of the bearings in the opposite direction to the other plate, and an adjustable rigid abutment for the plates farthest from the bearing.
- 782,259.—Retort Coke-Oven. Clyde S. Mason, Buffalo, N.Y. The combination of a series of horizontal retort-ovens, combustion-chambers below the same, vertical heating-flues arranged between adjacent ovens and communicating at their lower ends with the combustion-chambers, and a plurality of horizontal flues between adjacent ovens, one of said flues communicating with the upper ends of the vertical flues and another of said flues extending from side to side of the series of ovens, the wall or walls separating, said horizontal flues being provided with openings for equalizing the flow of the gases.
- 782,235.—Ore-Sampler. Andrew G. Gullberg, New York, N.Y., assignor of one-half to Frank Klepetko, New York, N.Y. An automatic sampler, a suitable oscillating cutter or sample-hopper, an oscillating lock-lever, intermediate connections between the lever and cutter, and suitable driving mechanisms for actuating the lock-lever and cutter.
- Feb. 21, 1905.
- 783,304.—Ore Concentrator. Michael E. Parks, Torreon, Mexico. An ore-concentrator, comprising an outer structure, transverse forward and rearward vertical partitions dividing the interior thereof into a concentrator-box, a tailings-box, and a slimes-box, and a vertically-reciprocatory jigger in the concentrator-box, combined with means for operating the same, said rearward partition being less in height than the walls of the structure, and said forward partition less in height than the rearward partition, the inner side of the jigger being also less in height than the outer side thereof.
- 783,323.—Ore-Crusher. Frank P. Snow, Los Angeles, Cal., assignor to Frederick W. Braun, Los Angeles, Cal. A rock-crusher having a suitable hopper or receptacle for the rock, a vertically-removable stationary jaw, adjustably secured at its lower end within the frame; a vibrative jaw mounted at its upper end upon an eccentric driving-shaft; an independent vibrative toggle pivoted in a plane below the free end of the vibrative jaw and having its outer end located within the lower end of said jaw, and a spring connected with the vibrative jaw and with the frame; whereby a circular or gyratory movement is imparted to the upper end of the vibrative jaw and the lower end of the same is caused to describe an arc of small amplitude, thus imparting an oscillatory and vibrative movement to the lower end.
- 782,893.—Method of Treating Alkali-Metal Amalgam. Charles E. Baker and Arthur W. Burwell, Cleveland, Ohio. A process which consists in heating the amalgam in presence of hydrogen to form a hydrid of the alkali metal, distilling the mercury, then increasing the temperature to decompose said hydrid and free the alkali metal.
- Feb. 28, 1905.
- 783,600.—Process of Extracting Copper from Ores. George H. Waterbury, Denver, Colo., assignor to The Waterbury Metals Extraction Company, Spokane, Wash. A process consisting in placing the suitably-pulverized ore in a solution composed of water saturated with sulfurous acid and containing a comparatively small quantity of sulfuric acid, subjecting the mass to agitation until the copper is dissolved, drawing off the solution containing the copper and placing it in a receptacle containing metal sufficiently divided to allow the solution to circulate there through, and subjecting the solution to agitation until the copper is precipitated.
- 783,736.—Electric Furnace. George O. Seward, Holcombs Rock, Va., assignor to the Wilson Aluminium Company, New York, N.Y., a corporation of New York. The combination with an electric furnace cover through which an electrode passes, of a separate-lid forming a complete ring around the electrode for holding the same in position, said lid having a passage for the circulation of cooling-water.
- 783,905.—Ball-Mill. Otto Spine, Brunswick, Germany. A ball-mill having a rotatable body which downwardly and outwardly flares to a substantially horizontal rim, the latter being provided with radial partitions, a fixed rim with which the rim of the body cooperates, and a cover removably and fixedly held on the upper portion of the body and having its lower edge located inwardly at a distance from the upper edge of the fixed rim.
- 783,535.—Smelting-Furnace. Michael Murphy, Pueblo, Colo., assignor of one-half to Fred. W. Lucco, Pueblo, Colo. A smelting-furnace having a transverse air-passage below the ore bed and just in rear of the bridge-wall the ends of which extend through the side walls of the furnace and communicate with the outer air, and a series of longitudinal air-passages beneath the ore-bed communicating at their front ends with the transverse air-passage and having their rear ends communicating with the outer air.
- 783,903.—Ore-Furnace. August Skoog, Shreveport, La. The combination with a plurality of vertically-disposed alternately-arranged fire and ore chambers, a transverse partition in the fire-chambers, oppositely-located fire-boxes, one for each fire-chamber, said fire-chambers having openings in their end walls through which the products of the fires are delivered in opposite directions, tilting arranged in the ore-chambers in staggered formation whereby a sinuous passage is provided for the ore, said tilting arranged to provide passages at the extreme ends of the chambers through which the products of combustion will travel upwardly, means for feeding material to the ore-chambers, and means for discharging the ore from said chambers.



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 \$1.00 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.

PROVINCE OF QUEBEC

The attention of Miners and Capitalists in the United States
and in Europe is invited to the

GREAT MINERAL TERRITORY

Open for investment in the Province of Quebec.

Gold, Silver, Copper, Iron, Asbestos, Mica, Plumbago, Phosphate,
Chromic Iron, Galena, Etc.

ORNAMENTAL AND STRUCTURAL MATERIALS IN ABUNDANT VARIETY.

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

Mining concessions are divided into three classes:—

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

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

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

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

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

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

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

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

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

(b) Licenses may be obtained from the Commissioner on the following terms:—Application for an exploration and prospecting license, if the mine is on private land, \$2 for every 100 acres or fraction of 100 ; if the mine is on Crown lands (1) in surveyed 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.**

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 1903 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.



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 15 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 extending 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 made 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, 1,500 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.

Department of the Interior.

Ottawa, February, 1904.

W. W. CORY,

Deputy of the Minister of the Interior.

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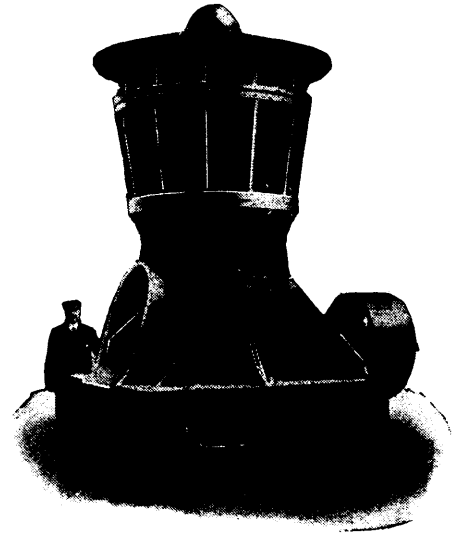
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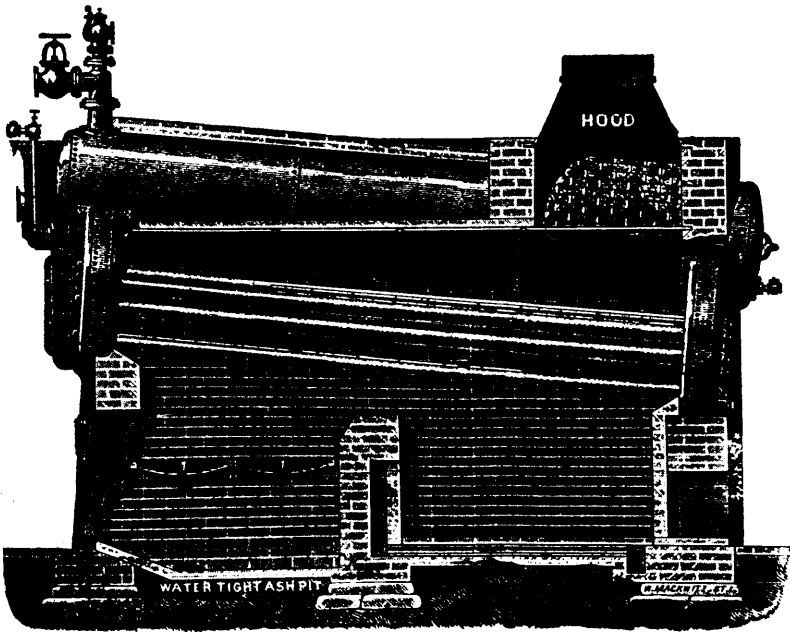
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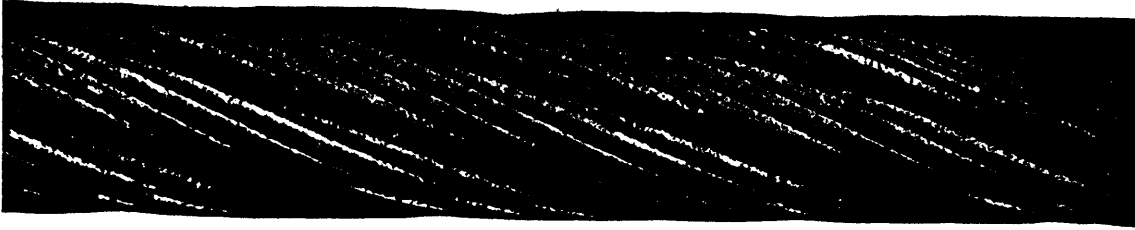
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