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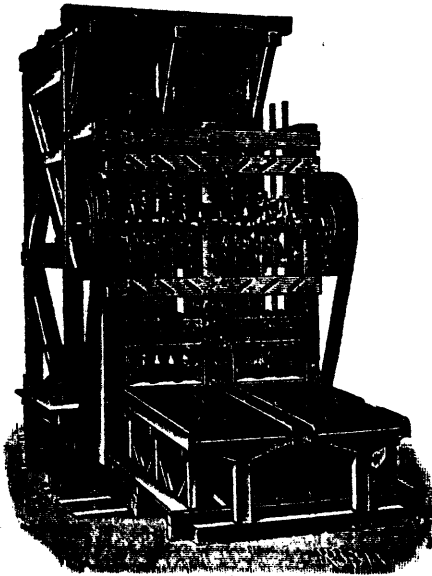
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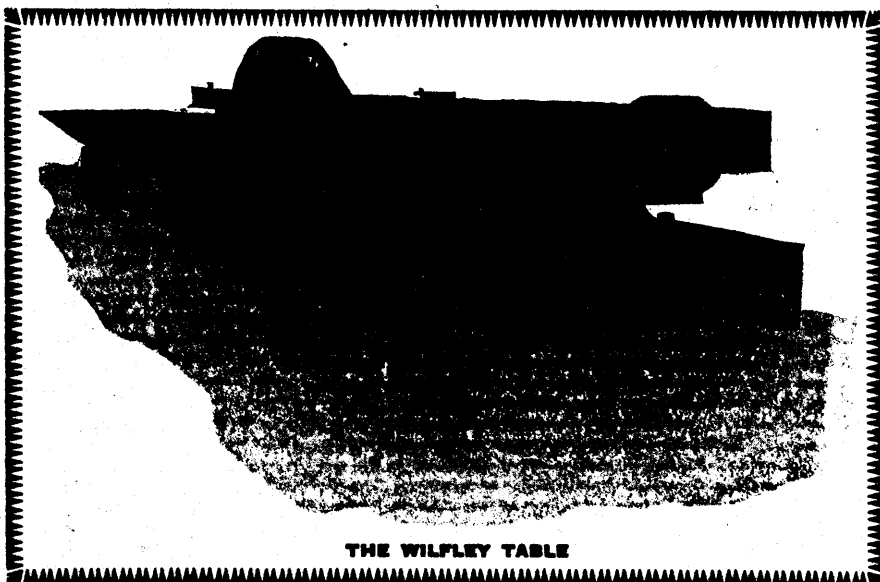
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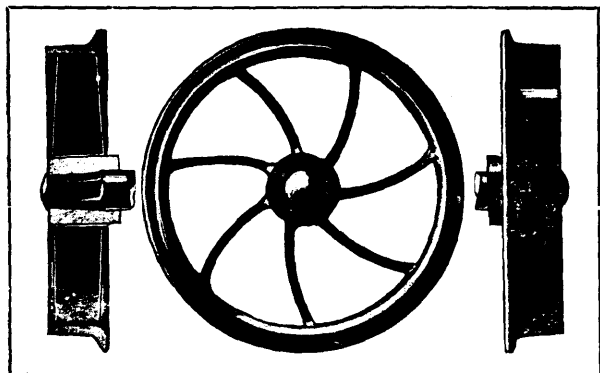
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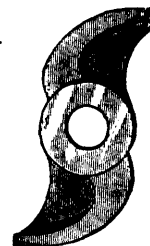
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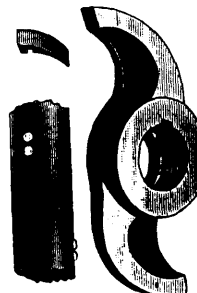


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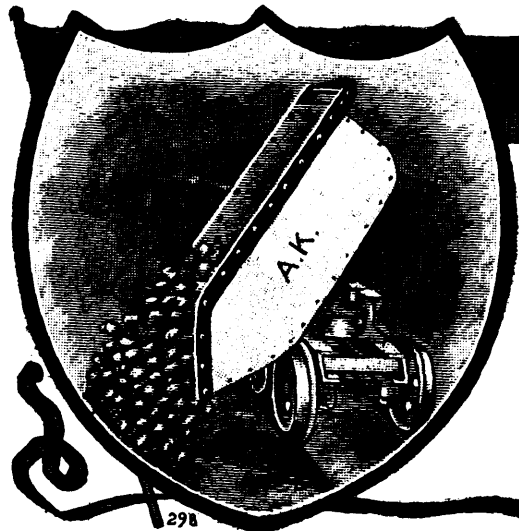
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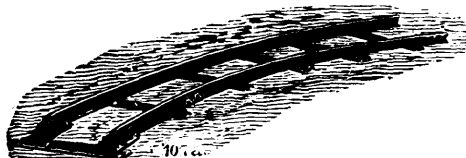
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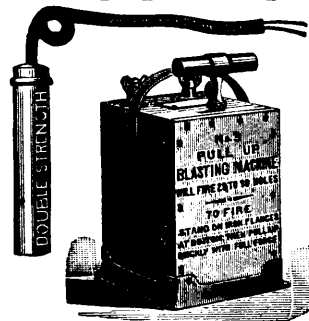


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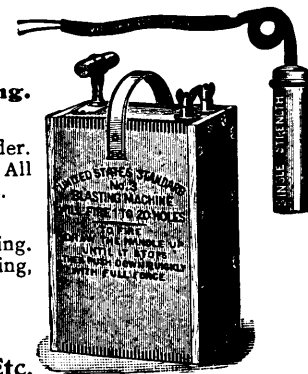
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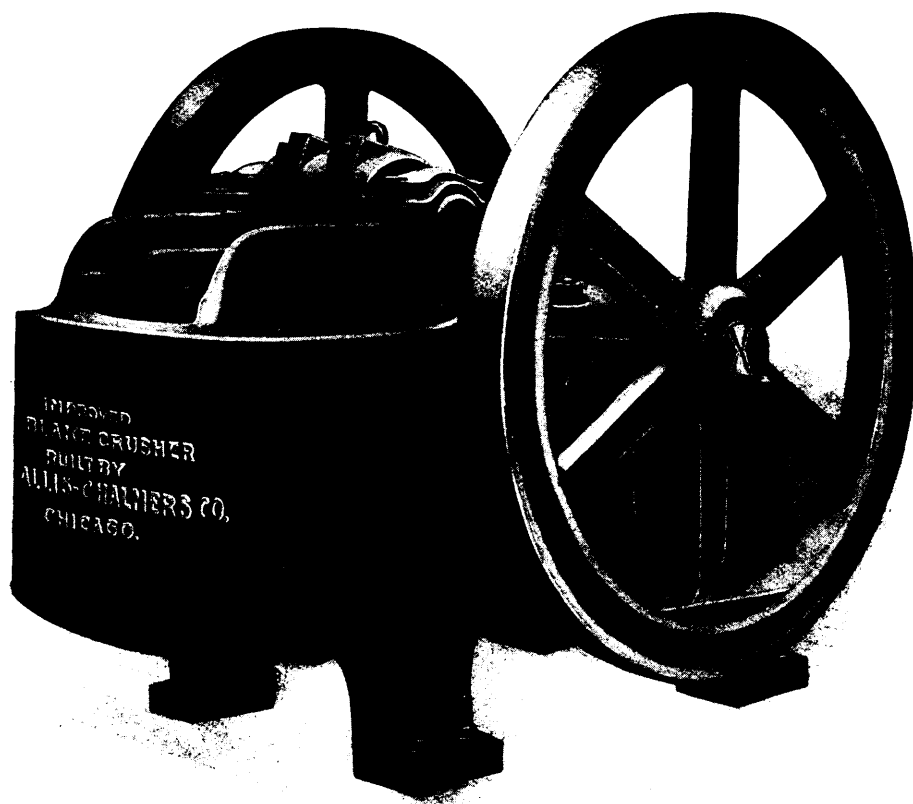
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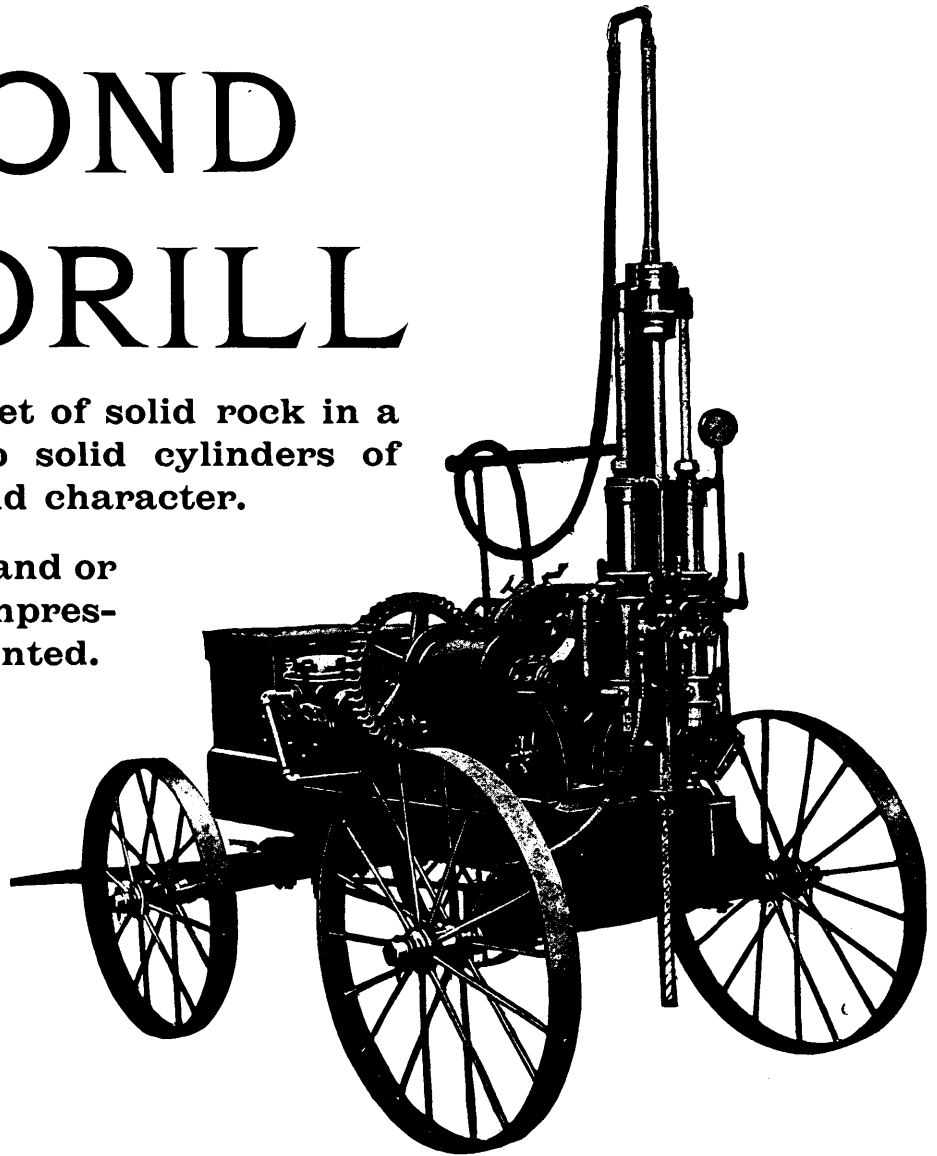
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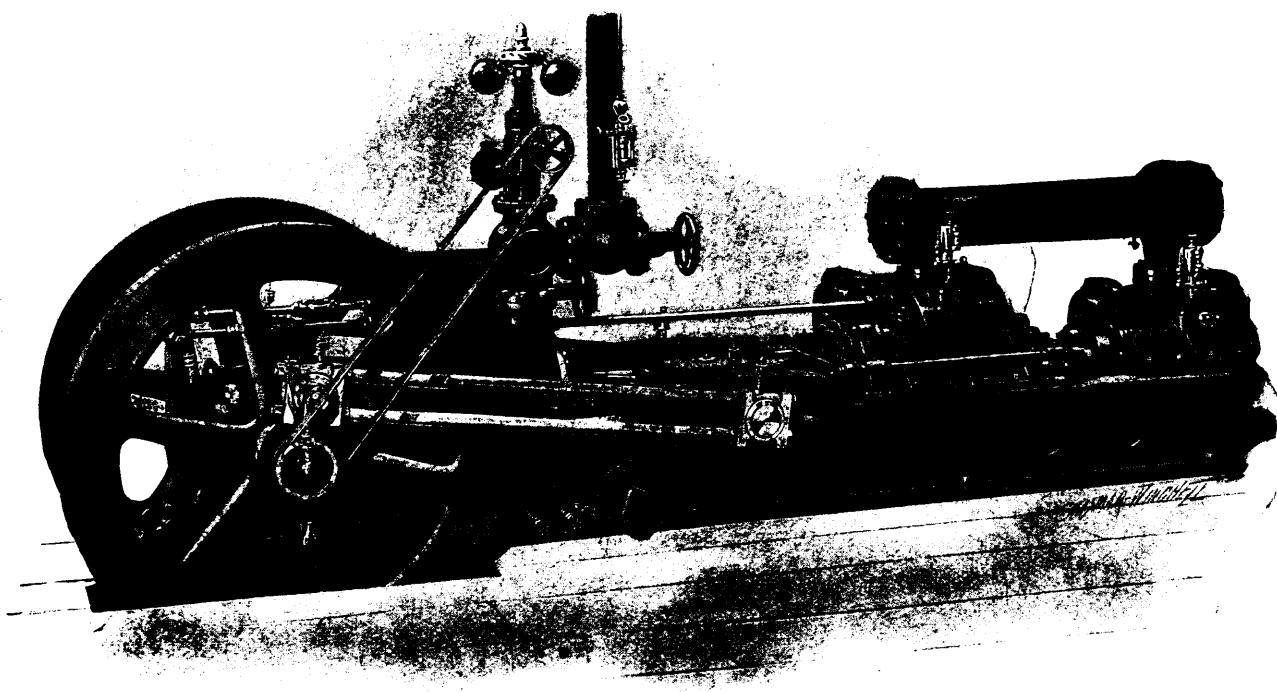
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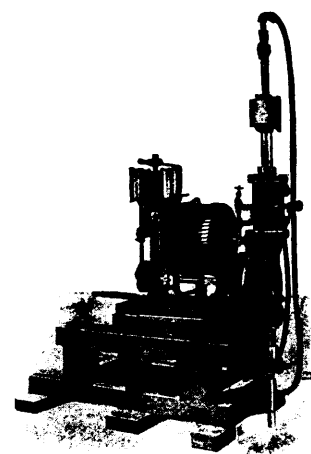
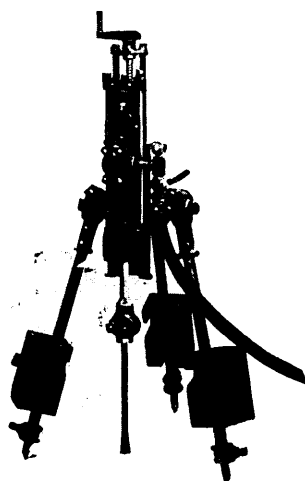


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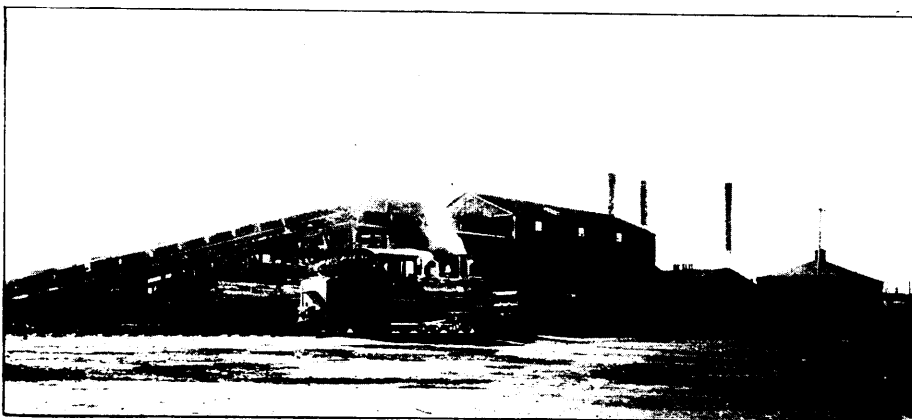
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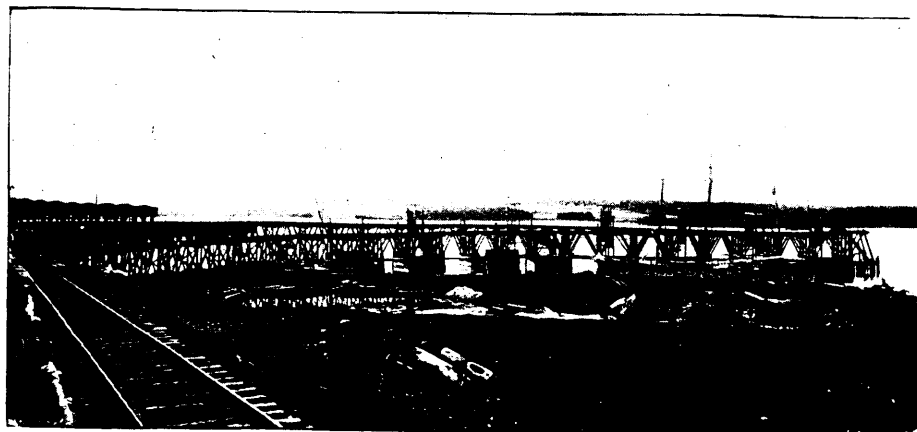
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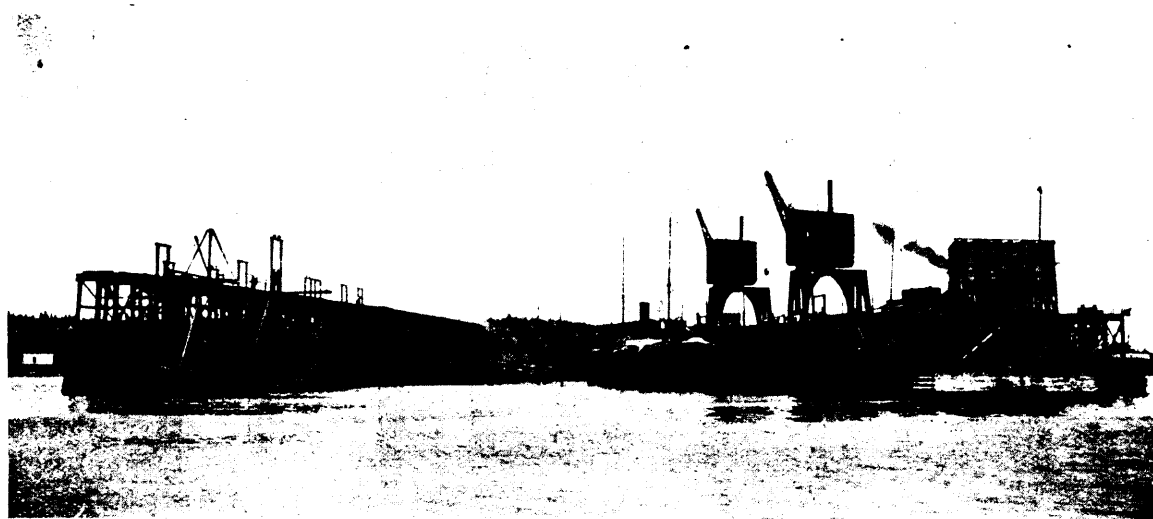
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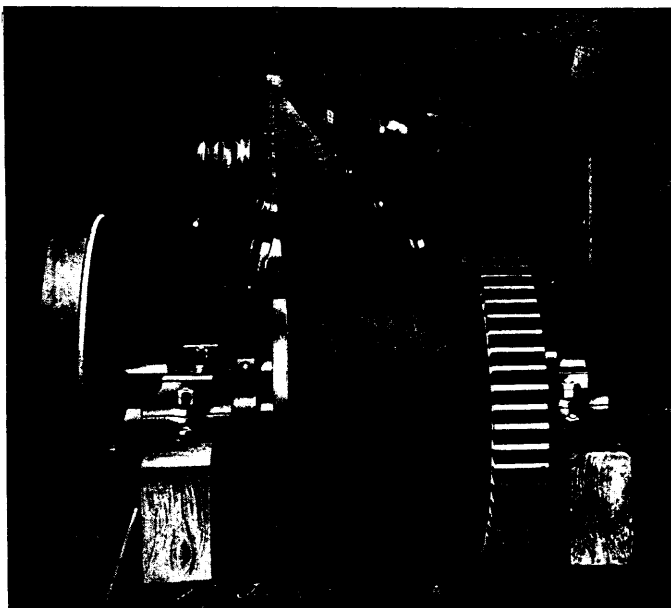
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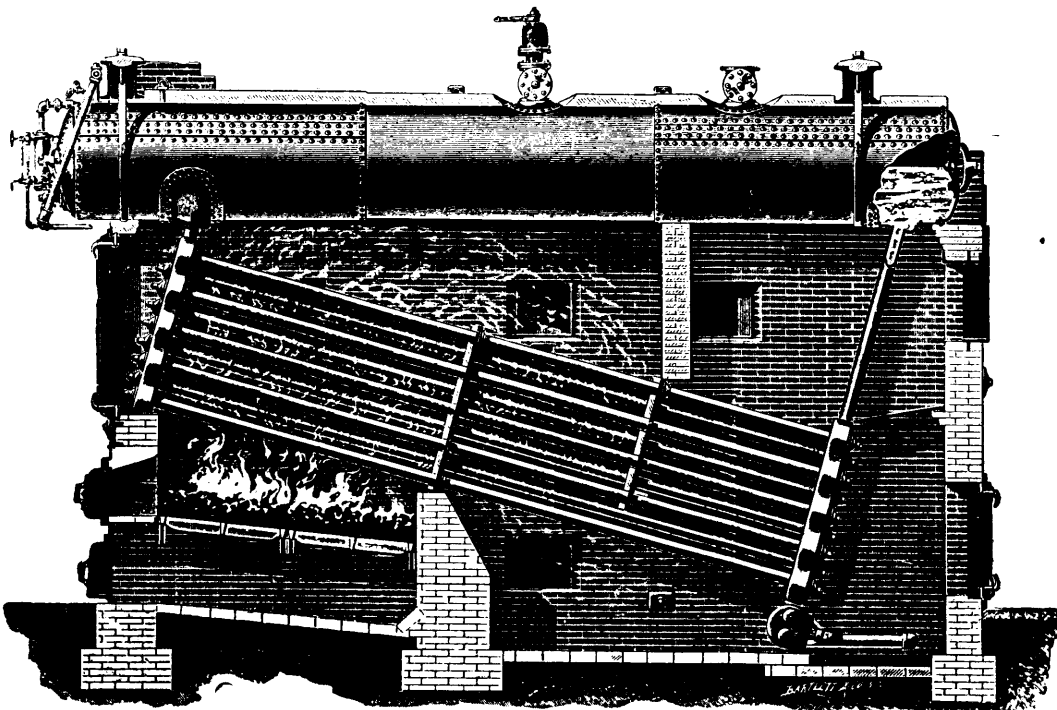
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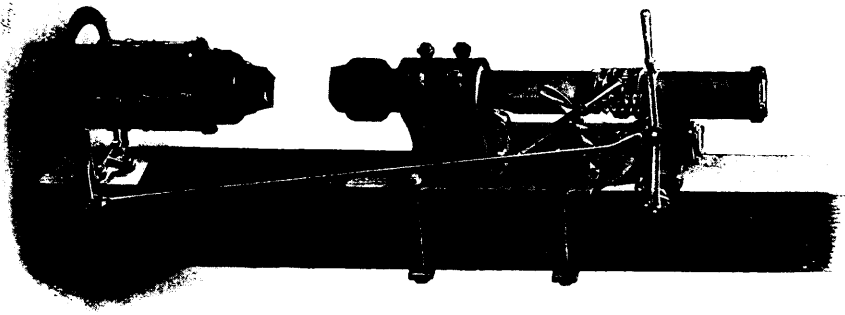
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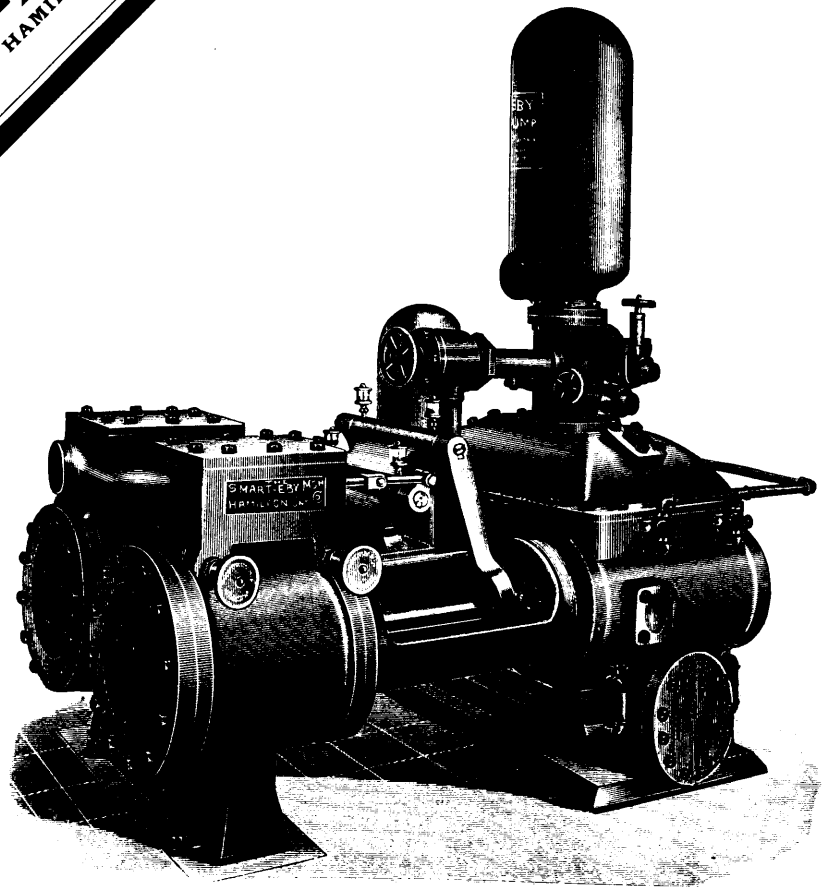
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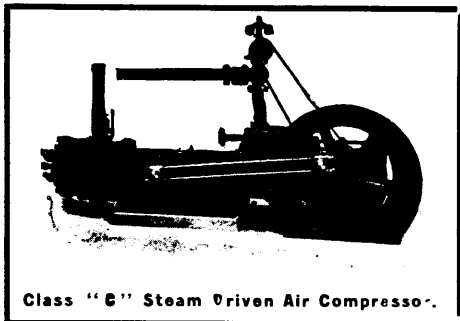
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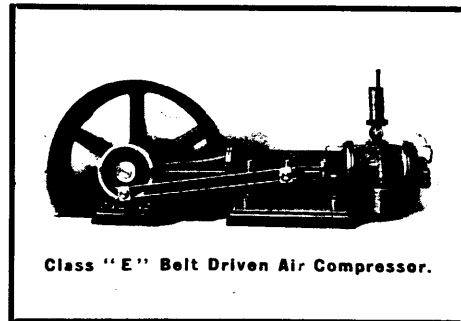
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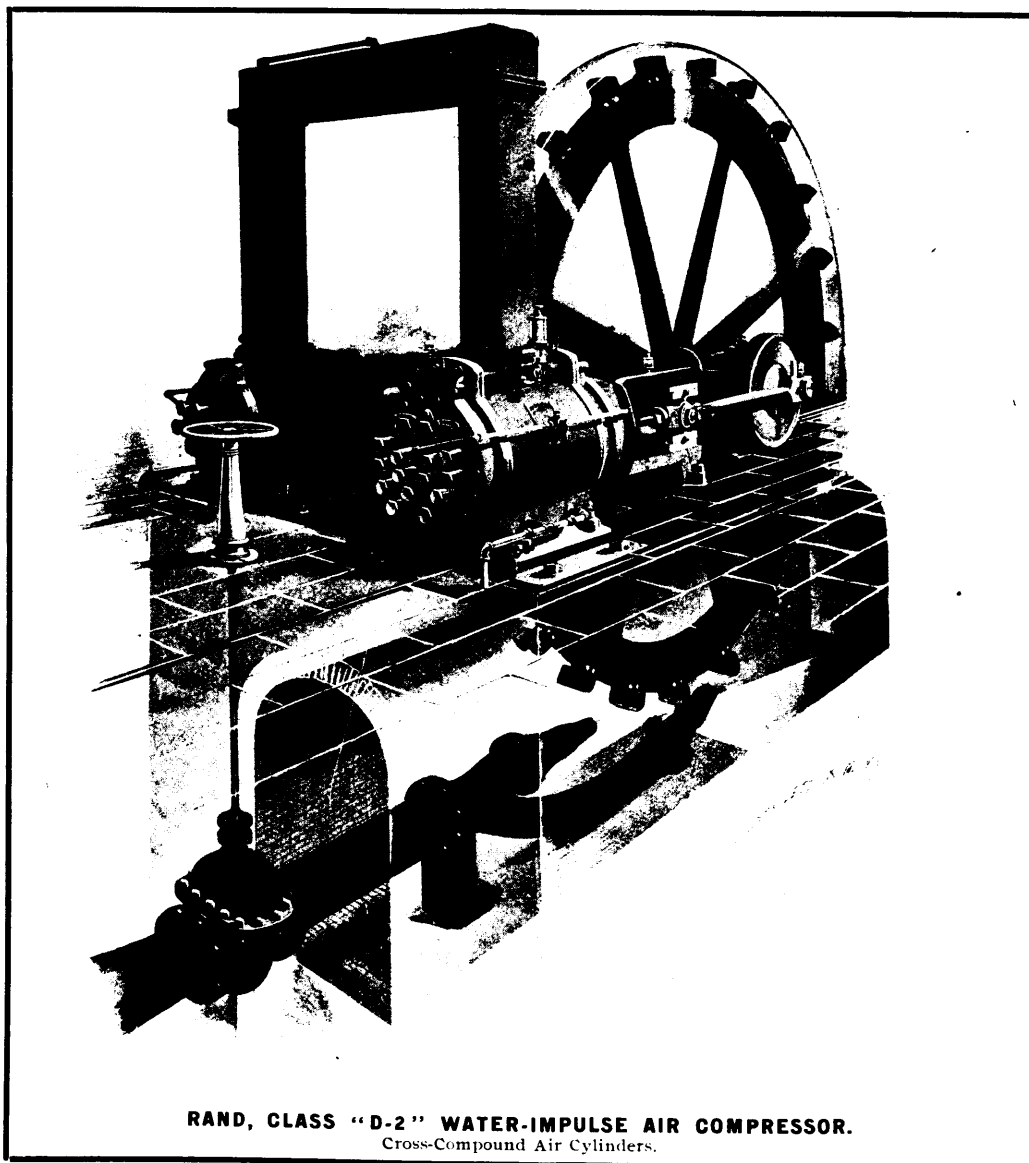
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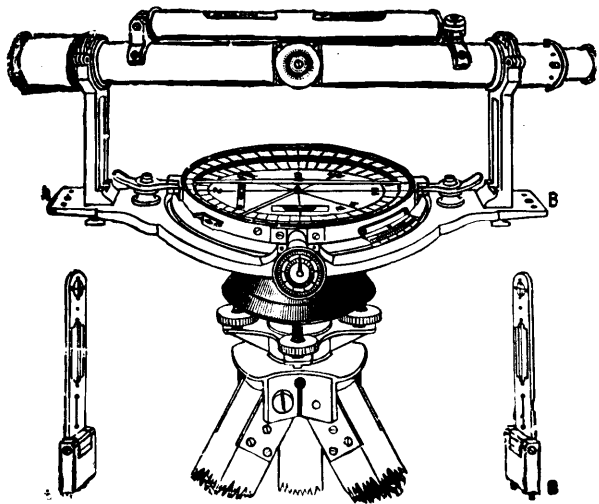


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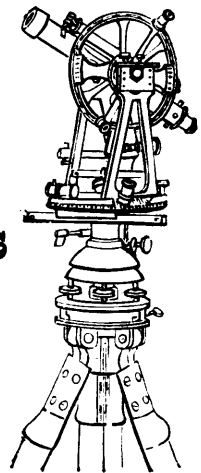
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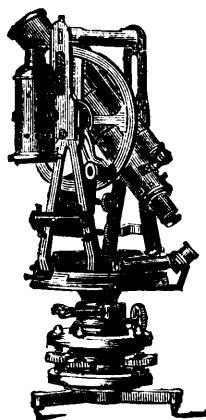
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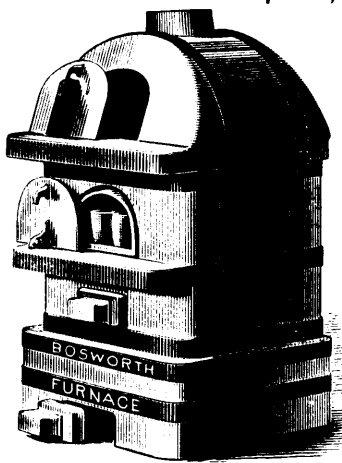
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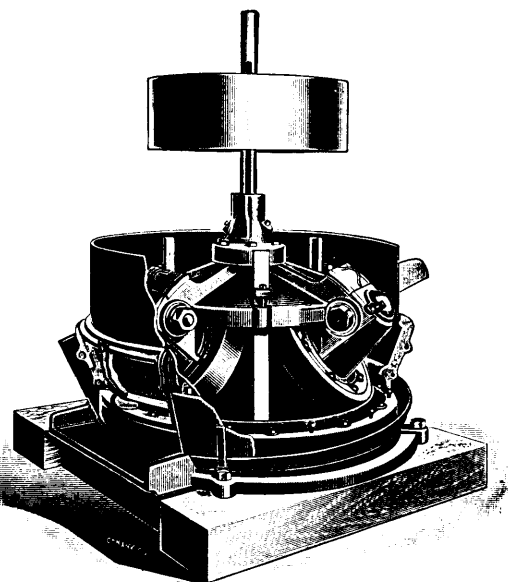
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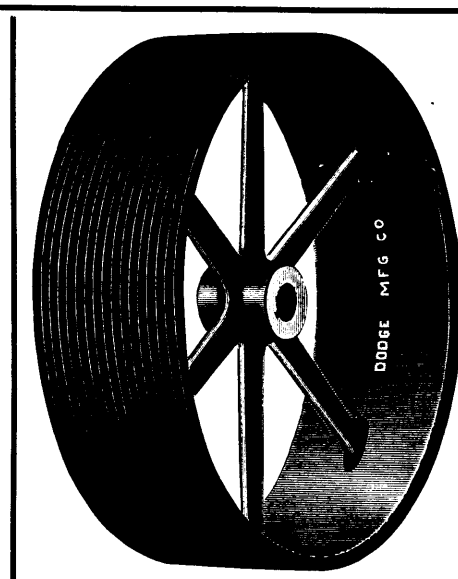
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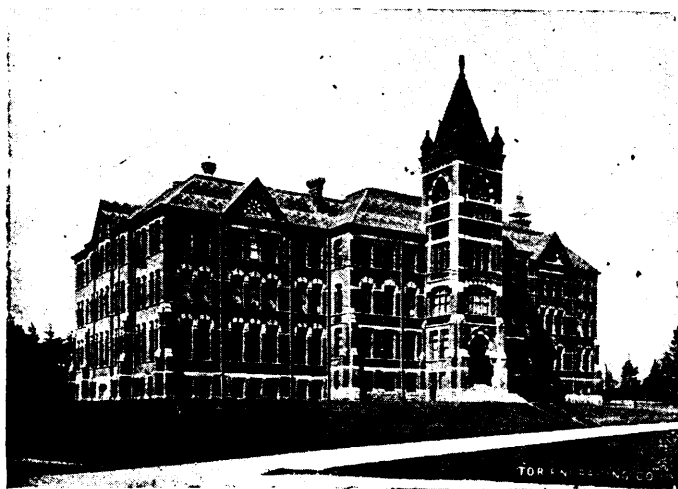
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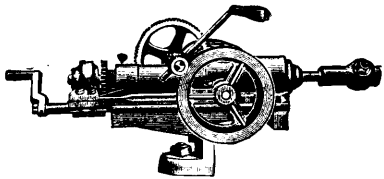
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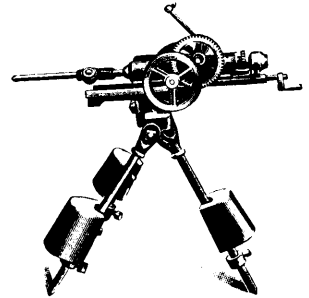
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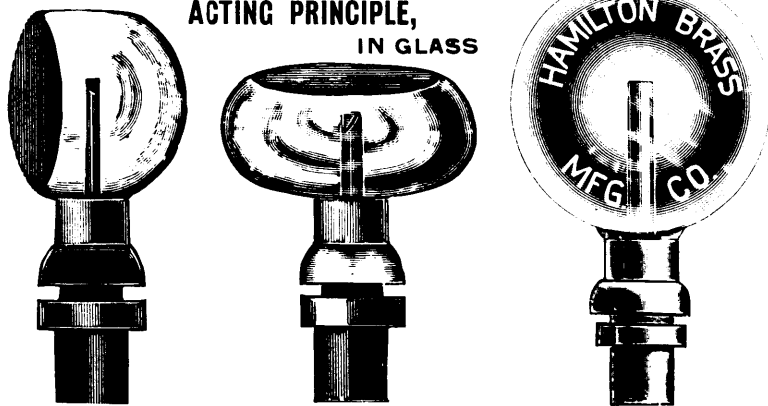
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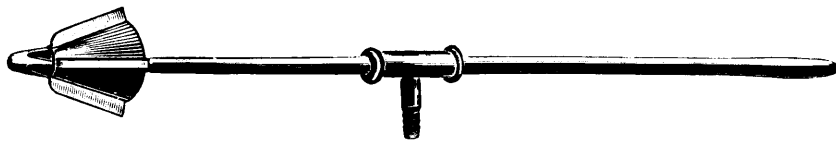
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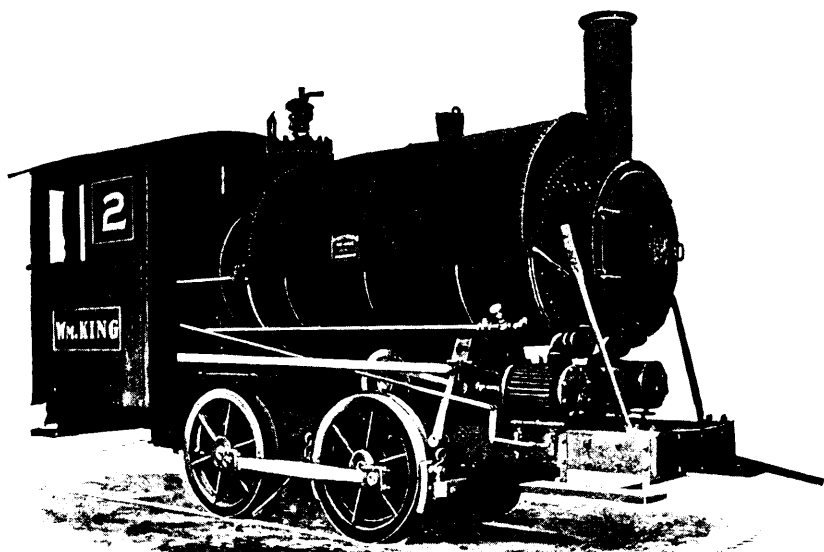
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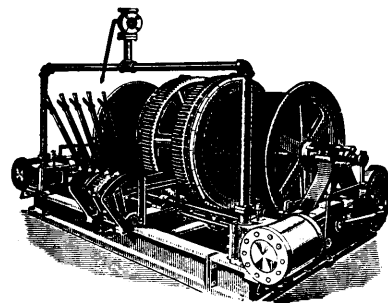
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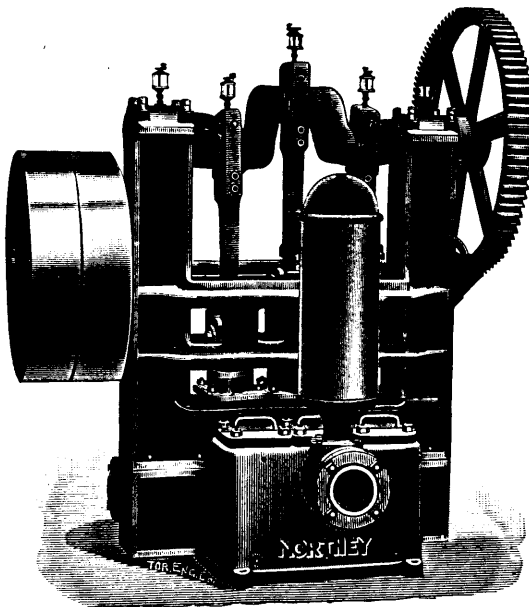
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THE NORTHLEY CO.,

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The CANADIAN MINING REVIEW

Established 1882

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

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Dominion Coal and Dominion Iron and Steel.

The heavy dealings during the past two or three months on the stock markets of Montreal, Toronto and Boston, in the securities of the Dominion Coal Co., and of the Dominion Iron and Steel Co., and the sensational advance in the Common Stock of the former company, whereby, in this short period its value has been enhanced to the extent of some nine million dollars, have caused increased attention to be turned to that remote corner of our Dominion, where on the rocky sea-girt shores of Cape Breton Island one great industry has, after many years of gradual steady growth, attained that importance which the splendid natural advantages of the country have always assured to it as an ultimate certainty, and where a second and kindred industry, carrying with it perhaps even greater possibilities of commercial success, is slowly but surely reaching that stage of development at which its promoters can plume themselves upon having successfully accomplished what they started out to do viz: to demonstrate that iron and steel can be manufactured in Cape Breton of a quality and at a cost which will meet and overcome competition from any of the great iron and steel producing centres of the United States. We hesitate, however, to say that there is anything in the present aspect of the affairs of either company, healthy and hopeful as these undoubtedly are, to justify such prices as are being paid for their common stocks. The values these have reached appear to be the result of a speculative mania that has become epidemic in certain quarters rather than to be based upon a cool and calculating survey of the situation and we should say that there is bound to be a reaction from the present period of inflation.

The coal company has just closed what, without doubt, has been the most successful year in its history, and the investing public has abundant confidence in the present management to conduct the business of the company shrewdly and wisely. In addition to holding and adding to its trade on this side of the Atlantic, the company has effected an entrance this winter into European markets and has thus shown that the increased output which will follow upon the developments now going on, can be disposed of. Leaving the much discussed Everett contract aside, the American market cannot be anything but an uncertain factor so long as the present duty of sixty-seven cents per ton is maintained. Geographically a natural market for Provincial coal, as New England assuredly is, this duty stands in the way of any steady business, and it is only when one of the pinches that the U. S. coal trade is liable to (arising from a strike, car shortage or some similar trouble) occurs that Nova Scotia coal can find its way

to Boston and neighboring ports. Such an opportunity, having as its origin a severe car shortage, has occurred this winter and has afforded the Dominion Coal Co., a very convenient outlet for its coal during the months when the St. Lawrence is closed to it.

A comparative table of the shipments over the past four years will show the growth of the Company's business:

1898-9.....	1,145,865 tons
1899-1900.....	1,661,706 "
1900-1.	1,957,300 "
1901-2.....	2,412,525 "

This current year the shipments are confidently expected to reach three million tons and the Canadian market at least is in a condition to encourage such an estimate. The Dominion Iron and Steel Company will likewise be larger consumers as their business increases. But it must be remembered that the contracts with this Company and with the New England Gas and Coke Co., were made at very low prices—particularly the last named one, which Mr. James Ross is said to be making efforts to get cancelled. Seeing that these two concerns between them can take care of about half of the total output, the prices obtained from them must lower very appreciably the average profit per ton on the coal mined. At the price at which coal is selling at present however and in the face of these two contracts, the Dominion Coal Co. should, on a shipment of three million tons, earn enough money to pay a handsome dividend on the common stock, after taking care of its fixed charges. But, while holding this sanguine view, we must maintain that in view of the many and almost unavoidable risks that a mining corporation is liable to, there is nothing in the present situation to justify such a figure as 119 for its common stock, and this quotation must be taken rather as evidence of a struggle for control between rival factions, or of a purely speculative epidemic, rather than of present intrinsic value. Meantime every confidence is felt locally and abroad in the ability of the present general manager, Mr. Cornelius Shields, to carry the affairs of the Company steadily along the path of success, and an abiding trust in the guiding hand of Mr. James Ross at the helm has, we believe, been as potent a factor as anything else among Canadian investors in bringing about what many consider the present fictitious value of the stock.

It must be remembered that the Dominion Coal Co. has sources of profit other than its coal, in its stores and in operating the forty miles of railway between Sydney and Louisburg, to say nothing of its fleet of steamers. We have always understood that the various mines' stores, while paying a good percentage upon the large amount of capital tied up in them, are run more in the interest of the employees of

the company with a view of furnishing a constant supply of good provisions and other necessaries, rather than as a merely money making venture. It is rather a favorite pastime in some quarters to abuse and hold up to execration what are termed the "pluck me's", but we feel sure that any legislation directed against such stores as are run by the Dominion Coal Co. would be inimical to the best interests of the workmen. Judging from official returns the operation of the company's railway must be very profitable. From recent reports we presume that the present passenger traffic between Sydney and Glace Bay *via* the interlying mines will cease with the inauguration of the electric railway which is about to be built along the roadbed of the old Reserve narrow gauge railway. It will be remembered that last year the Cape Breton Electric Company (or the well-known Boston firm of Stone & Webster figuring under a provincial charter) obtained franchises in the County of Cape Breton for building an electric tramway in Sydney and connecting it with Glace Bay and the mining districts. The Dominion Coal Co., seeing its railway business threatened, countered this scheme with a declaration of its intention to also build an electric railway along its old Reserve narrow gauge roadbed. A struggle was averted and a compromise arrived at whereby a third corporation was formed, controlled in equal proportions by the Dominion Coal Co., and the Cape Breton Electric Co., and the coming summer will see Glace Bay and the surrounding mining district connected with the Shire town by the inevitable trolley of modern civilization. Hardby at his Glace Bay station, Marconi will be receiving and sending wireless messages to and from Penzance and it will be left for Mons. Santos-Dumont to come over and establish a line of airships to take care of the smuggling trade between Cape Breton and St. Pierre.

The success of the Dominion Iron and Steel Co., from the standpoint of an outsider, appears to be still in a more or less problematical stage, but the men who are most deeply interested financially in the undertaking—and they are best qualified to speak authoritatively—have never for a moment wavered in their confidence and are as sure of ultimate success as of the daily sunrise. They are perfectly frank as to the difficulties which the company has encountered,—difficulties often unforeseen, which are incidental to the initial stages of similar enterprises of great magnitude wherever started, and they are quite sanguine as to the ability of the officials in charge to surmount them.

The past year has been one of many and somewhat dramatic changes in the *personnel* of the official staff. But despite adverse criticism and stories of extravagances and mistakes, which these changes, not unnaturally, evoked, general and individual faith in the ultimate success of the venture and in the directorate of the company, does as not appear to have been very rudely shaken. No better proof of this can be cited than the fact that the first issue of ten millions of common stock did not have the effect, which might naturally be expected, of depreciating the market value of the fifteen millions already issued, but, on the contrary, has apparently had a strengthening effect, seeing that the stock has subsequently advanced ten or twelve points. This may not be strictly a case of cause and effect, but the fact cannot be lost sight of that the common stock advanced very materially after and in spite the announcement of the new issue. The primary conditions have been proved beyond a peradventure to be as favorable as was claimed at the outset. The pig iron has found favor in many markets on both sides of the Atlantic and the steel that is now being turned out is of excellent quality. The work of construction was more protracted than we promised in the days of early enthusiasm, and difficulties have undoubtedly been met with, chiefly in connection with the working of the furnaces, that were unforeseen and that have seriously hampered operations. One of the furnaces has been laid off altogether to be relined, and it is understood that the same course will

have to be followed with the other three. This, of course, curtails the output of pig very considerably, but no works can be free from difficulties of this sort, and we have been assured on the authority of those who are competent to judge, that the troubles which have occurred can and will be rectified, and that their effect can only be to retard, and in no way to jeopardise, the ultimate and complete success of this great enterprise. The steel-making end is an unqualified success and when the rail mill now in course of construction gets to work, we prophesy that the earning capabilities of the company will astonish those who now hold pessimistic views.

The most important change that has taken place during the past year in connection with the two large corporations now under notice, has been the transfer of controlling influence from American into Canadian hands and the installation of Mr. James Ross as the virtual head of both concerns. Mr. Henry M. Whitney has so far retained the presidency of both companies and maintained an interest in and a friendly attitude towards them, and we earnestly hope that he will long continue to do so. It must not for a moment be forgotten that to the genius of Mr. Whitney and to his energy and business acumen, is due the credit for the present state of activity in and around Sydney, which has brought wealth to so many and occupation to thousands. It must not be a case of "*Le Roi est mort ; vive le Roi*". And, unless we have strangely erred in gauging local sentiment in this matter, the people of Nova Scotia in general and of the County of Cape Breton in particular entertain strong feelings of gratitude and of personal regard toward Mr. Whitney, not only for what he has done in developing the vast coal fields of the Island and in providing new uses and new markets for its coal, but for his friendly and generous attitude towards any movement that was calculated to bring happiness or benefit in any way to those living in and around the districts that were affected by his business operations—Cape Breton we feel sure will not be slow to pay a proper tribute of gratitude to Mr. Whitney for all that she has gained during the past nine years through his exploitation of her resources.

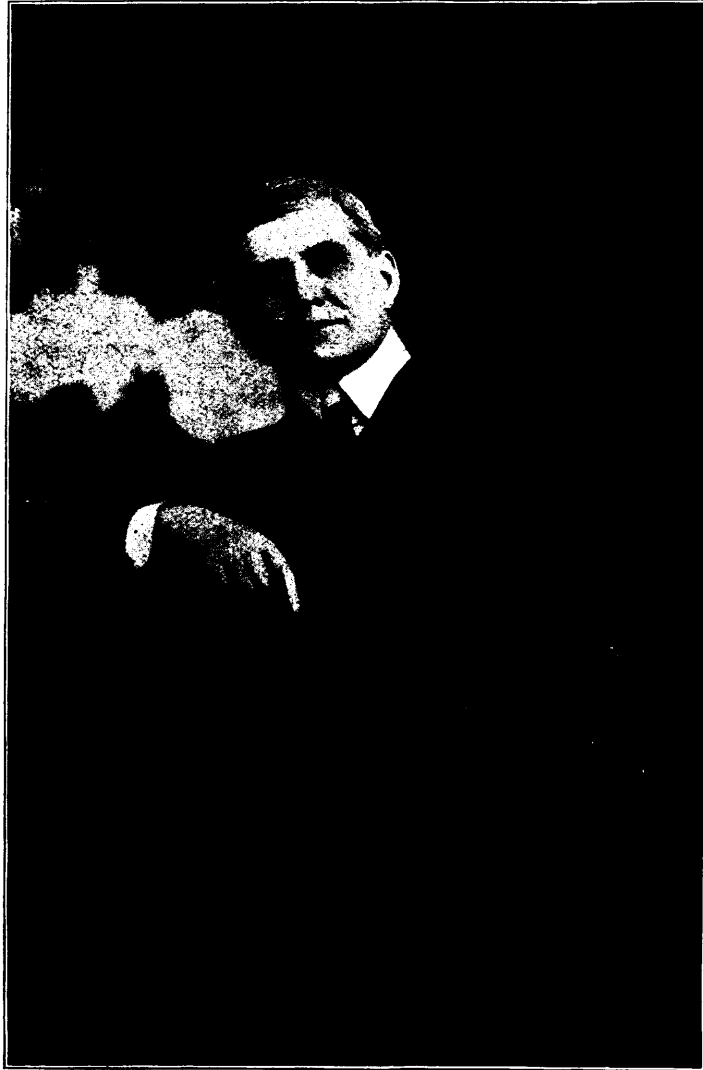
The Interior British Columbia Mineral Field

The approximate and advance estimate, for 1901, of the mineral production, including coal, of British Columbia as made by the Provincial Mineralogist is 871,832 tons mined, value \$20,713,501. Compared with the previous year 554,796 tons mined, value \$16,344,751. There is a considerable advance and this advance has been made under many draw backs.

These disadvantages appear to have been exaggerated or at least aggravated by adverse opinions of the country widely published. Mining stocks are low and money for investment in mines is not at all free, but, *bona fide* mining is more prevalent than heretofore even under the real disadvantages of costly operation and low price of metals.

Under the low prices of Lead, Silver and Copper, at the present time, there is still an increasing production. The development of the past year has been quite favorable. The average grade of ore is lowering steadily along with a lowering in costs of production or treatment. This is a natural consequence and increases tonnage and industry all round. The deeper levels of the mines show, on the whole, no loss of values, in several instances quite the reverse.

The average value of these 871,832 tons of ore mined in 1901 is nearly \$24.00 a ton. It may be said this proves nothing. However it may be said also that it points to no poverty of mineral. Nearly half of that tonnage is of much lower grade and is produced and reduced at a cost said to be as low as any on the continent. We may



MR. CORNELIUS SHIELDS, SYDNEY, C.B.
Vice-President and General Manager,
Dominion Coal Co. Limited.

also hope for a less cost of production and treatment for much of the other half as things go on. To some extent the following estimates of the average local value of the ores mined will illustrate the costs of their production. These estimates may be derived directly from the tonnage and values given in the advance report of the Provincial Mineralogist excepting East Kootenay and the Coast mines.

LOCALITY.	METALS.	TONNAGE.	AV. VALUE PER TON.
East Kootenay.....	Silver and Lead.	26,536	\$20 to \$25
Nelson.....	Gold, Silver and Copper.	103,486	10.72
Slocan and Ainsworth...	Silver and Lead.	30,267	74.00
Lardeau and others.....	Silver and Lead.	1,229	127.00
Rossland (Trail).....	Gold and Copper.	279,084	13.81
Boundary & Kettle River	Gold and Copper.	401,008	11.71
Coast Mines.....	Gold and Copper.	23,394	\$20 to \$25

This classification holds fairly well for the principal tonnage of each of the above localities, districts or divisions. However, the value per ton of the output of the larger mines in each division is somewhat lower than this general average. The general average being apparently raised by a smaller tonnage of higher grade ore. The camps which have the highest values per ton have correspondingly high costs of production and treatment. As time goes on these costs will be reduced and a greater tonnage of lower grade be produced.

The value \$14,250,541 estimated as the production of *lode* mining, comes from that transverse section of British Columbia which lies between the main C.P.R. line and the U. S. boundary. West of the Kootenay—Columbia valley to the Coast.

Leaving out the Coast production of about \$250,000 the rest comes from the interior strip east of the coast ranges. An area of about 125 miles north and south by 200 miles east and west. Twelve years ago this district itself was not known to be widely mineralized with metallic ores. It was in much the same condition as Cariboo, Omenica, and Cassiar at this present time, but was more accessible. It had been traversed and nearly worked out as a placer district. The old Dewdney trail crossed it and passed close by some of the present mines, on its way to the Wild Horse placers.

The interior strips of British Columbia lying between the great valley west of the Rockies and the Granite Coast Ranges continues N.N.W. with great similarity of topography and geological conditions right up to the Yukon Country.

Dr. Dawson on page 28 of his 1887 Yukon Report says of this persistency of similar rock series, in that district:—

“Speaking broadly, however, and with reference to the general features of the region, the rock series represented are evidently similar to those found in the southern portion of British Columbia, between the Rocky Mountains and the Coast, and an important general result of the work here reported on, is the further demonstration of the great constancy in lithological characters of the several formations, when following in the direction of the main north-west and south-east axes of uplift. A constancy which contrasts materially with the diversity found when comparisons are made as between localities situated at right angles to that direction.”

It is reasonable to suppose that this mountain region already proved to be a great mineral bearer in the United States, and Southern British Columbia, will continue the same to the northwards especially with rocks so similar and so similarly affected by geological conditions.

Whatever may be its mineral wealth, its extent is very great. A strip about 1300 miles long from the U. S. boundary to Alaska, and 150 to 200 miles broad, from the Rockies to the Coast Ranges. Within this great tract of country are the Placer gold fields of Upper

Fraser river, Old Cariboo, Omenica, Cassiar, Stikine, Dease and Atlin, and the Yukon, already discovered and only worked partially and to a certain grade of richness governed by the costs of these remote places. At the present time possibly no lode mining camps of equal richness to those of Southern Kootenay may be discovered and opened up as time goes on, but this great district looks as well favored in that respect as Southern Kootenay did at the time it was a placer district, and nothing more, a few years ago.

Concerning the distribution of lode minerals as observed without close prospecting, Dr. Dawson mentions the presence of galena carrying 75 ounces of silver to the ton on McDane Creek in Cassiar. Mr. McConnell writes of “large veins of highly argentiferous galena in Omenica. The geological conditions of these districts are said to be favorable to the production of ore bodies.

In the district which lies north of Revelstoke and Kamloops, many bodies of silver, lead and gold ores have been discovered. These do not appear to be exceptionally rich, but carry very fair values if made easily accessible. North of this and east of the great valley is the mica-bearing formation already shown to carry valuable mica over a wide extent of country.

The gold quartz discoveries of Old Cariboo are usually of low grade, containing values from trace up to an ounce per ton in gold. Values of \$17.03 per ton were, however, milled from the Walbur ledge in 1887.

Bridge River and the Upper Fraser river show some favorable ore bodies if operated under more accessible conditions. Some ore has also been treated in this district.

The special attention given to placer mining in the northern portion of British Columbia and the Yukon, during the past five years has resulted in discoveries of large ore-bodies in Atlin, White Horse and Rainy Hollow. These do not appear to be of high grade, but they show the mineral capacity of the country, and the present operation of two stamp mills. The Ladue and Munger mills near Dawson, show that lode mining is going on at the other end of this 1300 mile stretch of the mineral belt of B.C. and the Yukon.

With present conditions of costly prospecting and transportation this great mineral reserve remains a wilderness, except for the operations of placer and hydraulic mining, but there seems little doubt that it will be traversed by railroads before very long. At least across its more southerly portion from Yellowhead Pass to a port on the Pacific Coast, north of Vancouver.

Mining Prosperity in Ontario.

The prosperity which has attended mining enterprise throughout the Dominion during the past year has been particularly noticeable in Ontario, the value of the year's output being estimated at about \$12,000,000 as compared with \$9,298,624 in 1900. Complete figures for the year are, of course, unobtainable at this early period of the year, but some interesting data is furnished by Mr. T. W. Gibson the Director of Mines, in a bulletin issued on 4th instant, from which we quote:—

“Almost the whole of this increase is in the products of metalliferous mines and works, the value of which is about 100 per cent. more than in the previous year. Most of the non-metallic products also show increased values, but these are largely offset by a falling off in the yield of petroleum, and a reduction in the quantity and value of petroleum products.

The chief increases are as follows:—

	Increase in quantity.	Increase in value.
Copper....	2,346,000 lbs., or 35 per cent.	\$ 269,399 or 84 per cent.
Nickel....	1,802,000 " 25 "	1,103,344 " 145 "
Iron Ore..	182,236 tons 201 "	62,623 " 56 "
Pig Iron...	53,984 " 86 "	765,637 " 82 "

The principal decreases are :—

	Decrease in quantity.	Decrease in value.
Petroleum..	1,948,283 Imp. gals or 8 per cent.	\$ 401,105 or 21 per cent.
Natural gas.....	56,640 " 15 "

The good demand and relatively high prices for nickel, which have prevailed for some time, are reflected in the output for 1901, the largest yet recorded. The increase in value is greater than the increase in production, for the reason that the nickel-copper matte in which the metal is contained now being produced at the Sudbury mines is of much higher grade than heretofore the same remarks apply to copper, the price of which was well maintained until about the close of the year, when it broke heavily. Part of the copper output was from the non-nickeliferous mines on the north shore of Lake Huron.

The increased production of iron ore is due to the development of the Helen mine in Michipicoten, which shipped freely during the year, both to Ontario furnaces and the United States.

The greater output of pig iron is owing to the fact that there are now three furnaces in operation as against two in 1900, the Canada Iron Furnace Company's smelter at Midland having been blown in about the end of that year. There were smelted 109,009 tons of Ontario ore and 85,399 tons imported from the United States, in all 194,408 tons; the proportion of native ore used being thus about 56 per cent.

Since the beginning of the present year steel-making, heretofore carried on at Hamilton only, has been begun at the Clergue works, Sault Ste. Marie.

In case of petroleum the quantity given is the number of gallons of crude output, while the value is that of illuminating oil and other products of refinement, and in addition the value of the crude used as such for fuel and gas-making purposes, which absorbed about 15 per cent. of the yield.

The action of the government in stopping the export of natural gas from the Essex field to Detroit explains the diminution in value of this product.

I may point out that the values of the several products are calculated at the selling prices at the mines or works, not at the prices of the refined or finished articles. If the latter basis have been adopted, as is sometimes done, the value of the copper output for the year would have been about \$1,450,000, instead of \$589,080, and of nickel about \$4,440,090 instead of \$1,850,070; while the aggregate value of the year's production would have been increased by about \$3,400,000. It is not clear, however, that this method of tabulating values is applicable to unrefined or partially treated metals which are exported for the final processes, when it would not be employed in the case of other raw or unfinished materials, and the values at the mines or works have accordingly been adhered to.

Strictly speaking, the value of the iron ore, both native and foreign, smelted into pig iron, and of the pig iron converted into steel, should be deducted from the aggregate value of the year's production; the foreign ore because it is not a product of Ontario, and the native ore and pig iron to prevent the value of these articles being reckoned twice. The items would amount to about \$500,000 but it has not been thought necessary to make the deduction, and with this explanation there is no danger of the matter being misunderstood.

Arsenic, carbide of calcium and corundum are beginning to be important products. The first and last named are not mined elsewhere in Canada, arsenic not elsewhere in America."

The National Importance of Mining.

By MR. JOHN E. HARDMAN, S.B., M.A.F., Montreal.

(Introducing topic for discussion at the Annual Meetings of the Canadian Mining Institute.)

After agreeing to present or introduce this topic for discussion, I chose the title of "The National Importance of the Mining Industry" rather than "Government Aid to Mining," for the reason that I wished to emphasize the duty of the *nation*, rather than the duty of the Provinces, to encourage an industry which has grown to be of such great importance to the Dominion. In considering the discussion of provincial matters, I felt that as a "Canadian" or National "Mining Institute" we had neither a right, nor a duty, to discuss provincial matters, but that our remarks should be confined to such topics as were within the jurisdiction of the Minister of the Interior, within whose department lies the administration of all federal matters which affect the industry of mining.

After listening to the figures which the Secretary has just read to you, the *national* importance to which the industry of mining has attained is axiomatic, and needs no demonstration. A total production of over seventy millions of dollars is eloquent testimony of the importance of an industry which produces annually such a large sum, and the figures are all the apology which is needed for introducing to this Institute a discussion as to whether, and how, the federal government can best assist and promote such an industry, not only to greater dimensions, but also to greater perfection, while still preserving and maintaining fidelity to that branch of the British North America Act by which the control and administration of minerals found within the borders of any particular province was vested in that province; and in doing so the necessity for confining my remarks and suggestions entirely within the limitations imposed by the title becomes apparent. I allude, therefore, to such matters as are strictly of *national* importance as distinguished from matters which are particularly *provincial* in their sphere.

In so doing, I am quite aware, from the printed pamphlet which is before you, and from other information which I have received personally from the Secretary, that I shall have to disregard and put out of consideration many suggestion which are of great importance, but which deal almost exclusively with matters of provincial jurisdiction, and cannot, therefore, be considered in a discussion of this topic. Many of these matters are of the highest importance, and perhaps it will not be unwelcome to simply allude to them and run over them as suggestions to provincial authorities.

First, the question of transportation, and by this word transportation I do not by any means wish or desire to refer solely to long distance transmission on railways, but more particularly to the equally important question of highroad transportation, where the bulk of the material to be handled has to be transported comparatively short distances only. Such transportation necessitates good high roads with easy grades and hard roadbeds so that a maximum load may be transported at a minimum cost.

Equally, the establishment of public assay offices, the giving of grants for the maintenance, or assistance, of mining schools, the assisting of schemes for deep sinking in the shape of subsidies, the establishment of governmental custom reduction works for the experimental beneficiation of ores, or of government diamond drills for the testing of private deposits: all are topics which interested mine owners may feel called upon to consider, but which the national government cannot consider inasmuch as all revenues coming from the working of these mineral deposits would go into the provincial treasury and not into the Dominion. To this may be added government aid to hospitals and accident relief funds, and the still more important question of proper governmental inspection of existing mines and mine workings.

Likewise, the question of import duties on machinery and upon supplies used by the miner, are not within the province of this Institute; they are more strictly political matters, and as such do not come within the domain of this Institute, and must be left to the consideration of those gentlemen now in session in Ottawa, known as the Parliament of Canada.

You will see, therefore, that the subject is not a simple one, but a very complex one, and worthy of extended discussion and most minute investigation; for while Canada, as a nation, derives no direct benefit in the shape of royalties, etc., (excepting from the Yukon and North-West Territories), yet the mining industry, indirectly, is a source of great national wealth by reason of the taxes, duties, supplies bought, etc., etc., all of which contribute to the national wealth on account of the increased consumption of foreign goods in the shape of machinery and supplies, on account of the greatly increased number of manual labourers, which implies equally the increase of labor for a large portion of the population working at remunerative wages, and thereby contributing its quota to the general prosperity of the merchants and of the whole country.

Now, as to guidance as to what one may reasonably expect of the federal government in the shape of help, we must turn and consider what has been done by other governments in other parts of the world where similar deposits of mineral richness have occurred, and where similar requests for aid have been made, entertained, and (perhaps) granted. Britain's colonies, such as New South Wales, Victoria, and New Zealand, have been very generous in their efforts to aid their own mining industry, and they have given grants for many of the subjects that I have just enumerated. The older European countries cannot be looked to for examples, inasmuch as new ground and undiscovered deposits are the exception and not the rule in their domain. Perhaps one of the best hints that we can get to guide us in the consideration of this matter is given by the great commonwealth on our southern border.

And in entering upon this matter and discussing it, we cannot do better than to take our first lesson in the shape of noting that in the United States the mining division, or the Geological Survey department, is entirely and *absolutely divorced from politics* in every shape and sense of the word; neither the head nor the subordinates of any such department are political appointees, neither are they under civil service rules, but they are considered as business employees to be used just so long as they give value received for their salaries, and to be summarily dismissed when such salaries are not earned. It has seemed to me, and I invite your discussion of my reasons, that no part nor branch nor department of the federal government is so well qualified to undertake assistance to the mining industry as a properly organized and well constituted Geological Survey. I see this evening, on looking about me, many gentlemen from the national capital who have been paying extreme and minute attention to my remarks thus far, and I am glad to see these gentlemen here, and I am sorry that they are not all of them members of the Institute. There are, however, a number of them who are members, and who will probably, I am glad to say, take part in this discussion, and will tend to elucidate those matters upon which I may be more or less obscure.

The question of what is the proper and legitimate field of a Geological Survey is a legitimate one for discussion, and is not out of place under the title of "The National Importance of the Mining Industry," and it may be well, particularly before so many mining men who, in my experience, are rarely acquainted either with what the Geological Survey is actually doing or what is its proper function to do, to review briefly what a geological survey is *supposed* to do. And before starting let me say one more word, and that is that the mining industry is an industry of *facts* and of *deeds*, all the better perhaps when it is aided by sound theory, and in what I am going to say I wish to

announce that I say it solely and simply from the standpoint of the practical man who *does*, and wants others to *do*, but for whom theoretical discussions have always had a great attraction and a great value, and who is very much indebted to theoretical views for the small share of success which has been his portion.

The primary work of the Survey may be considered as (1) the determination and publication of facts concerning the local distribution of rocks; in other words, what is known scientifically as "Areal" Geology; (2) the determination and publication of the general facts of the geology of a country; to arrive both at the local distribution and at the general facts as mentioned, it is necessary to provide departments for the various branches of work, and first and foremost comes in the necessity for accurate maps on which the facts of local, or general distribution, may be laid down. This is the first and essential prerequisite for the departments which follow, and I may say here that the ordinary maps provided by the various Crown Lands Departments are by no means of sufficient accuracy, or of the necessary character, to permit of geologic work being laid out upon them. The second subdivision is that of the Geological Division, in which is included Paleontology, by which the rocks are labelled, as it were, and their position on the earth's crust ascertained; third, the Petrographical which is allied the Chemical and Physical divisions, and which are necessary to determine different rocks, and the different questions affecting those rocks as to composition and characteristics. The inter-dependence of these various branches with the more purely geologic is evident, and there must be a constant interchange between the Geological staff and the staffs of the Paleontological, Petrographical, Chemical and Physical divisions. Each of these divisions requires the supervision of an expert. But, in addition to the above departments, whose work is of interest only to a small number or fraction of the total population, there must be means of making these facts generally understandable by the public, and by that largely increasing body in Canada, the men who are directly interested in the production of metallic wealth. Without taking up your time, I may say that the other departments include the statistical work, the editorial, the supervision of illustrations, the care of the library, and the disbursements of money, with many other smaller branches, which thus create an administrative branch as well as a scientific one. In the present condition of our Dominion, as regards the fostering of the mining industry, and the equally important field of informing our citizens and the world at large of what our resources are, a distinct prominence must be given to *Economic Geology*, which, briefly described, is the practical application of geological investigation to the development of the mineral resources of a country. This division of Economic Geology is, by far, more important to Canada's citizens at the present moment than any descriptive or purely structural geology can be, although, as you will notice as this discussion proceeds, I am firmly of the opinion that no economic geology is worthy of the name unless it is preceded or accompanied by such accurate descriptive work as will fully elucidate the many problems which inevitably come up in economic work. In fact, it is not going too far to say that the lack of such proper economic geological work rendered possible to a great extent that inflation in British Columbia during the years 1896-97 which was so disastrous in its effects, and which I think I am right in saying was due more to the ignorance of the limitations of the deposits then discovered, than to the actual ignorance and incompetence which was displayed in the mining work then and afterwards.

Recognizing, therefore, the importance of this economic geology, which we may paraphrase into Mining Geology, I may say that the work of the Survey at the present time *should* be divided into (1) General Geology, and (2) Mining Geology; with the objects of providing not only the geologic map and a knowledge of areas of different formations with their structural relations, but also to provide special

information concerning our mineral resources, and definite knowledge concerning the origin, structure and relation of the ore deposits which are found in Canada.

The section of Mining Geology, or economic geology, appeals to the mining engineer, and to his clients, who are that portion of the public, native or foreign, which contemplates the development of the country's resources. The relation of the geologist to the mining engineer is a relation similar to that which the engineer holds to his clients and to the general public. The duty of the mining engineer to his employer is to place before him in intelligible shape the character, mode of occurrence and probable quantity and value of the minerals which are contained in such property, and also the best method of obtaining the same from such a property. The government geologist, having a wider field, should have more comprehensive views, and his study should consider, not particularly the interests of any single mine, but rather the general interests of a whole group of mines or of a mining region, for it is a truism to say that trustworthy results are only obtained when they are founded on sound and accurate knowledge of the geologic structure of the region in which the deposits occur. As a mining engineer, I am sure that I am giving the opinions of my confreres when I say that if we do not give geology in our reports it is either because no data on the geology of the region have been published, or because our clients especially desire fact and figures, and not theories. From one of the heads of the United States Geological Survey, who I am glad to say was my old chief and instructor, I quote that there are three standpoints from which the relation of a geological survey to the mining industry of the country may be viewed: (1) the purely scientific or geological point, (2) the technical point, (3) the commercial point, and as from the nature of things the third point often demands only the consideration of a very small portion of a particular district, it is not the business of the government to consider such a view point.

The governing principle of a government Geological Survey in economic work should be that it will do for the mining industry, as a whole, what the unaided individual engineer or mine owner can *not* do, that it should never undertake what can just as well be done by the individual engineer or owner, and also that it should never interfere, favorably or unfavorably, with the private business of individuals or corporations, nor should it in any way enter into competition with professional men, such as mining engineers, commercial geologists, and chemists. It goes without saying, that no member of the Survey should be permitted to make any examinations, execute any surveys, nor write any reports for private persons or corporations. The energies of the department should be devoted to such branches as are of immediate use to the greatest number of the country's citizens, and along such lines investigation should lead either to the establishment of broad general deductions, or to the publication of monographs which have the most immediate bearing upon the prosperity of the country, and which are of value to as great, if not a greater number as the broad general investigations just mentioned. In a country containing so large an area as our Dominion, work by any force that can reasonably be employed must be confined for many years to such localities or districts as have contained the most extensive mining developments, or to such new sections as imperatively cry for authoritative investigation; and, apropos of studies in mining districts in which developments have been extensive, the geologist in making such studies often attains results which are of immediate value to the mine owners and prospectors in that particular section. Such results may be of secondary importance to the general public, but they are of immediate importance to the people interested, and are therefore justified, and the deductions from any such particular districts would, correctly generalized, be of benefit to the whole community.

It will be seen that many of the departments of the Survey are already equipped for the determination of such facts as I have men-

tioned, and if a new Bureau of Mines, or Economic Geology department, be established, any two such Bureaus would of necessity overlap each other, causing a waste of funds and of time if they were not correlated and under one jurisdiction. To separate such work into two departments would be a mistake, as neither branch in such a supposed case could, or would, avail itself of the information gained by the other. But in any proposed re-organization of the Geological Survey, or any organization of the proposed new Department of Mines, one fact should stand out clearly and distinctly, and that is, that the director and all subordinates of such department must, beyond any question or suspicion, be absolutely free from political interference or influence which can be exercised either to retain them in their office or to procure for them advancement. In my personal opinion, employees of such departments should not be on the permanent list; they should be made to feel that their status is dependent upon the work they do, and they should be treated as ordinary men are treated, and made to feel that so long as they perform their work satisfactorily they will be retained, but that no political influence, nor Civil Service Act, nor anything else will avail them against dismissal when dismissal is merited.

It is easy to foresee that, under such a Survey as I am attempting to indicate, demands would be made by citizens from all over the country, and to such an extent as to entirely overshadow the possible resources for any one year. The choice of field, therefore, in which work should be done may properly be governed by the principle, that developed districts give increased opportunities for obtaining a large number of facts, afford grounds for generalizations and for special studies, which not only are of permanent value to that particular district, but will be of great accessory value to other districts, with like or even dissimilar considerations. From partially developed districts only superficial facts can be obtained, and any expression of opinion as to the probable value of such a district is more properly the province of the mining engineer than of the geologist.

The general principle governing the work of any survey on economic lines should be that ore deposits must be studied where they can be studied to the best advantage, and hence that although topographic work to some extent may be well distributed geographically, yet all geologic work must be free from local or provincial considerations, and must depend upon the importance of the problems to be solved, and of the best methods of solving them. It is within the knowledge of all of us that that British Columbia district of so much reputation, I refer to Rossland, was under study by the Canadian Geological Survey as early as 1896, that a map and some descriptive geological text was published, but consider the effect upon the commercial world if the Survey had undertaken an economic investigation and had published a monograph on the Rossland district of as complete a kind as this publication which I hold in my hand (exhibiting a United States Monograph). Again, consider the copper-nickel industry of Ontario, and the Sudbury District in particular, and with the exception of the preliminary sketch of elemental conditions published in 1891 by the present acting director of the Survey, what else can be found in the records of the Canadian Survey which bears at all upon an industry which may be roughly figured as productive of at least four millions of dollars a year for the last nine or ten years? I mention these two cases because in my capacity as President of this Institute for the first two years of its existence, and also in my personal and private capacity as a practicing engineer, I have been repeatedly approached by agents of both English and American capital for information contained in Government reports bearing upon these two districts, and, although in our Library downstairs we have a complete set of the Survey reports, and although these reports were consulted by such agents, yet, I was forced to admit in many cases that it was not creditable to the Government of Canada, and particularly the Department of the Geological Survey, that they had no information to give to investigators

which was of *commercial* value or of assistance to capital which was willing to invest if proper data could be furnished to it.

Coming now to the special question of what a geological survey may, or should, do towards technical investigation, or making technical studies in aid of the mining industry, it is difficult to attempt definite limitations. There is the danger of encroaching upon what is the legitimate field of the professional man, the mining engineer or the metallurgist, but the same principal can govern this that should govern every other department, viz: that in such technical matters the Survey had better confine itself to those investigations which the State is better fitted to make than is the individual.

The prominence given during the last two or three years to the iron industry of the Dominion demands a satisfactory and technical monograph which should describe and give all information possible respecting the various iron ores of the Dominion, the facilities for transportation of such ores, and the opportunities or difficulties of reaching markets. The concentration of that important metal, nickel, in one small area in the Province of Ontario fully justifies an extensive monograph on the occurrence and origin of the ores, the associated metals, the methods of mining, sorting, smelting, refining and marketing the product, together with information of the amount of precious metals contained, and, in general, going into all such details as would not be of prejudice to the owners in that section but which would be of immense advantage and aid in studying similar occurrences of similar rocks in other fields.

The depressing conditions which have attached to the silver-lead mining industry during the last twelve months might well be made the subject of an exhaustive inquiry in which actual facts might be obtained, actual costs laid down, and the proper avenue for disposition of the product indicated.

It may be objected by some of our neighbors to the south that we are going too far in asking for such authoritative information, but we in Canada have a greater right to ask for such inasmuch as not only does each of the provinces impose a royalty upon the various metals produced, but even the Dominion Government, in the lands still within its control, imposes a heavy royalty which entitles us to ask for a *quid pro quo*.

Manifestly it is impossible within the limits of such a paper as this, to notice the numerous pros and cons of argument which inevitably accompany the consideration of such a topic, but the duty which has been assigned to me has been simply to hand you out these various items as one might throw out so many balls which may be caught up by some of you and thrown about so as to provoke such a discussion as is absolutely necessary in order to obtain complete information.

I have spoken briefly of the primary work of the Survey, and its necessary subdivision into topography and geology with the correlated branches of petrography, paleontology and chemistry; there remains to be considered one of the chief, and I may say *most important*, functions of a properly constituted bureau of mines, or mining division, of the Geological Survey, and that is the collection of accurate statistics relating to the production of metals and minerals throughout the country.

This is the most important rock in the foundation of the mining business and is a first class reason for a mining bureau, if no other were forth-coming. It has been said, and well said, that no branch of statistical science is in greater need of technical knowledge and scientific system than that one which deals with the production of minerals, and I may add that none is more liable to bias and to be erroneous if the data are supplied by persons who are interested. The late Clarence King, in his introduction to the Tenth Census of the United States, (in which for the first time the collection of statistics of production from metallic mines were entrusted to a separate and expert

corps of enumerators largely gathered from, and under the direction of the United States Geological Survey) said that the experience of the United States at that time was that the best method for conducting such investigation seemed to be the one then employed, viz: of utilizing trained experts in the collection of these figures, and that such a system would produce the most perfect results, under favorable conditions of sufficient time and sufficient money. He added that such agents required a considerable experience to become thoroughly familiar with their duties, and that this work would be best accomplished by making such a bureau a permanent one, thereby retaining the services of men familiarized and accustomed to their work. Such a method is perhaps too expensive and too ambitious for our young country, but there is nothing to prevent approaching it, and emulating the example which was then set by Mr. King.

One of the necessary adjuncts for such a bureau of statistics must be sufficient funds to permit of the prompt publication of its reports; a branch of the Survey with a single chief and a competent corps should be included in any project for a mining bureau or for a reorganization of the present Survey. Its field is large and its functions should include the issuance of bulletins regarding the location and descriptions of known mineral localities, including even those of the rarer substances. In each yearly publication, in addition to a general statement of the production of the country and of the distribution of the useful minerals, there could be monographs or short articles on the growth of each industry and on each important metal or mineral by an expert in that particular method or mineral who was an authority on his subject, and who would present a strong, terse, and lucid exposition of the conditions attaching to that particular industrial mineral. Such chapters being necessarily as different in scope and methods of treatment as the minerals and methods themselves, could also contain such technical information as would be of interest to the mining public particularly, and the common public generally. For examples of what has been done in this line, and as object lessons, I may bring to your notice the annual reports of the State Mineralogist of California, and also the bulletins which have been issued by that office. With such publications coming from a responsible head the government would practically issue an annual census of the mineral industry, and a production of over \$70,000,000 a year fully justifies, in the eyes of the electors of this country, the study of the original sources of such mineral profits by a permanent bureau of sufficient size and properly endowed.

The minor questions of the water supplies of the country, the investigation of water powers and of possible irrigation supplies, is an undertaking worthy of any intelligent and self-respecting nation, and the utility of such a measure has already been recognised by an interested party—I refer to our great railway corporation—which has spent time and money in investigating the possible redemption of the arid lands of the North West Territories.

While on the subject of monographs let me say that the more purely geological branch can also follow such a method of promptly communicating results of their studies to the public. Discussions of smelting processes, of milling methods, of concentration and of the equally important matters of transportation and marketing can easily be fitted into their proper places, and are legitimate objects for the direct recognition of the Government. The fact that jurisdiction over the different mines is lodged with provincial governments should be no drawback to a proper elucidation, description and recognition of the same by the federal government.

I have presented to you only a skeleton of the subject, but I trust that those who follow me will supply the sinews, flesh and covering so that by the end of the session we shall have a comely figure as the result of our combined efforts.



MINING INSTITUTE

Canadian Mining Men Urge the Establishment of a Dominion Department of Mines and Again Successfully Oppose the Efforts of the Canadian Society of Civil Engineers to Secure Close Incorporation.— Many Valuable Papers Presented.

The annual gathering of Canadian Mining Engineers and Mine Managers which for over eleven years have been held annually in Montreal were this year a huge success both from the point of attendance and the exceedingly interesting character of the proceedings. The meetings opened on Tuesday morning and were continued until Friday, sessions being held in the Club Room of the Windsor Hotel.

The following, among others, were present:—C. Shields, General Manager Dominion Coal Co., Sydney, C.B.; P. L. Naismith, General Manager Alberta Railway and Coal Co., Lethbridge, Alta.; W. H. Aldridge, Canadian Smelting Works, Trail, B.C.; Hon. J. H. Ross, Commissioner of the Yukon Territory, Dawson, Y.T.; T. W. Gibson, Director of the Bureau of Mines, Toronto; J. Obalski, M.E., Inspector of Mines, Quebec; Dr. Eugene Haanel, Superintendent of Mines, Ottawa; Dr. Robert Bell, Acting Director, Geological Survey, Ottawa; J. C. Drewry, Canadian Gold Fields Syndicate, Rossland; James McEvoy, Crow's Nest Pass Coal Co., Fernie, B.C.; Dr. J. B. Porter, M.E., Prof. of Mining Engineering, Montreal; Dr. W. Goodwin, Director School of Mining, Kingston; P. Kirkgaard, M.E., Canadian Gold Fields, Deloro, Ont.; E. D. Ingall, M.E., Chief Div. of Mineral Statistics, Ottawa; Prof. W. G. Miller, School of Mining, Kingston; Prof. T. L. Walker, Prof. of Mineralogy, Toronto University, Toronto; Alex. B. Allan, (Allan, Whyte & Co.) Glasgow, Scotland; J. A. Hanway, Colonial Copper Co., New York; J. T. McCall, Canada Iron Furnace Co., Montreal; Dr. Frank D. Adams, McGill University, Montreal; H. M. Wylde, Sec. Mining Society of Nova Scotia, Halifax; Wm. Blakemore, Mining Engineer, Montreal; John E. Hardman, S.B., Mining Engineer, Montreal; Milton L. Hersey, M.A.Sc., Montreal; George R. Smith, M.L.A., Bell's Asbestos Co., Thetford Mines, Que.; R. T. Hopper, Standard Asbestos Co., Montreal; E. W. Gilman, Canadian Rand Drill Co., Sherbrooke, Que.; Eugene Coste, Mining Engineer, Toronto; Dr. A. E. Barlow, Geological Survey, Ottawa; Dr. R. A. Daly, Geological Survey, Ottawa; Dr. R. W. Eells, Geological Survey, Ottawa; Dr. H. M. Ami, Geological Survey, Ottawa; R. W. Brock, Geological Survey, Ottawa; Jules Côté, Secretary Department of Mines, Quebec; E. R. Faribault, Geological Survey, Ottawa; A. A. Bowman, Canadian Rand Drill Co., Toronto; D. D. Mann, MacKenzie & Mann, Toronto; S. J. Simpson, James Cooper Manufacturing Co., Montreal; J. E. Boss, Spokane, Wash.; Chas. D. Maze, Civil Engineer, Montreal; Prof. G. R. Mickle, School of Practical Science, Toronto; D. W. Robb, Robb Engineering Co., Amherst, N.S.; E. P. Mathewson, Metallurgist, Montreal; Andrew MacKenzie, Dominion Coal Co., Montreal; Daniel Smith, Ontario Powder Works, Kingston; W. T. Rodden, Hamilton Powder Co., Montreal; Robert Chalmers, Geological Survey, Ottawa; Hugh Fletcher, Geological Survey, Ottawa; J. A. Dresser, M.A., Richmond, Que.; J. M. Clark, K.C., Toronto; Frederick Hobart, Mining Engineer, New York; J. E. Rothwell, Mining Engineer, Tweed, Ont.; Chas. F. C. Hansen, Jas. Cooper Mfg. Co., Montreal; W. W. Leach, Geological Survey, Ottawa; H. W. DeCourtenay, (Firth & Sons) Montreal; Captain Robert C. Adams, Montreal; Joseph James, Actinolite, Ont.; W. H. Smith, M.E., Canada Iron Furnace Co., Montreal; O. N. Scott, Listowel, Ont.; C. M. Doolittle, Hamilton, Ont.; J. B. Tyrrell, Mining Engineer, Dawson, Y.T.; C. O. Senecal, Geological Survey, Ottawa; C. P. Hill, Kitchener, B.C.; C. F. Ludwig, Mine Superintendent Dominion Coal Co., Sydney, C.B.; B. T. A. Bell, Editor CANADIAN MINING REVIEW, Ottawa.

There was also a large attendance of Mining Students from McGill University and the Mining School of Kingston.

TUESDAY MORNING SESSION.

The opening session was held on Tuesday morning, 4th March, in the Library of the Institute, Mr. J. E. Hardman, in the absence of the President through illness, presiding.

The Minutes of the last Annual Meeting having been published in Vol. IV of the Journal of the Institute were held as read. The following new members were elected at this and the later sessions of the Institute:—

A. A. Bowman, Canadian Rand Drill Co., Toronto, Ont.
 Professor T. L. Walker, University of Toronto, Toronto, Ont.
 John E. Rothwell, Mining Engineer, Tweed, Ont.
 W. H. Smith, Canada Iron Furnace Co., Montreal, Que.
 Frederick Hobart, Mining Engineer, New York, N.Y.
 B. J. Forrest, Mining Engineer, Thornhill, Ont.
 Alfred C. Garde, Mining Engineer, Payne Cons. Mining Co., Sandon, B.C.
 Phelps Johnson, General Manager, Dominion Bridge Co., Montreal, Que.
 C. P. Hill, Kitchener, B.C.
 Hon. J. H. Ross, Commissioner Yukon Territory, Dawson City, Y.T.
 C. F. Ludwig, Mines Superintendent, Dominion Coal Co., Glace Bay, C.B.
 Dr. R. A. Daly, Geological Survey, Ottawa, Ont.
 B. A. C. Craig, General Manager, Canada Corundum Co., Toronto.
 Spencer L. Dale Harris, Ottawa.
 Erne Dill Harris, Kingston, Ont.
 H. W. McInnes, Mining Engineer, Halifax, N.S.
 Lt. E. Dale Harris, C.E., Wei Hai Wei, China.
 J. C. Drewry, Canadian Gold Fields Syndicate, Rossland, B.C.
 Hamilton Lindsay, C.E., Toronto, Ont.
 Allan Dale Harris, Montreal, Que.

SECRETARY'S REPORT.

Mr. B. T. A. BELL.—While the past year's operations in mining and metallurgical enterprise have been greater than at any period in the history of the Dominion, and there has been a very remarkable expansion in the production of coal and coke, iron and steel, nickel, copper and asbestos, the mining industry in certain districts of the West suffered from a depressed market for silver and lead, strikes, and, perhaps, more than to any other, from the natural and inevitable reaction following upon a period of unwholesome speculation in mines and mining shares. Later on in this report, I hope, as I did last year, to submit a few notes and statistics reviewing the more prominent features of mining activity in the various provinces and I only refer to this depression now as it has to some extent reflected upon the affairs of the Institute and may account for the fact that our membership does not show as large an increase as it did this time last year.

MEMBERSHIP.

At 31st December last our membership had increased to 331 as compared with 323 in 1900, 277 in 1899, and 192 when the Institute was reorganized under its present Charter in 1898.

It is also pleasing to note that while as usual at our Annual Meeting we lose a number of members our strength will be maintained, if not increased, by the acquisition of those who have been elected since the printed list was distributed, and by others, whose names will be submitted for your approval at this meeting.

Our Student Membership will, it is gratifying to report, be considerably reinforced by the affiliation en bloc of the members of the Mining Society of McGill, under a special clause in the By-Laws, recommended for your adoption by the Council.

The thoroughly representative character of our membership, embracing as it does the best elements in the profession and industry of mining in Canada, and its distribution by provinces and countries, will be seen by a reference to the printed list sent to members in January.

MEMBERS REMOVED BY DEATH.

It is my painful duty again to record the loss of three members by death since our last meeting together.

Mr. Lionel Shirley, Civil and Mining Engineer of Montreal, a gentleman who took a deep interest in the affairs of the Institute, died early in the year in the Western States whither he had gone on account of poor health. Latterly Mr. Shirley had been engaged in railway engineering but he will be remembered as one of the pioneers in the palmy days of phosphate mining on the Lievre and as the engineer who opened up that remarkable deposit of muscovite mica known as the Villeneuve Mine.

Mr. James F. Lewis, President of the Canadian Rand Drill Company of Sherbrooke, Que., who died after a long and painful illness, at Boston on July 23rd. A member of the Council, he was a never failing attendant at all its meetings, often at great inconvenience to himself and his business, while he was ever ready to give his time and his energy to promote the best interests of our organization. In the death

of genial, big-hearted "Jim" Lewis the Institute has indeed sustained a severe and irreparable loss.

Mr. J. Roderick Robertson, General Manager of the London & B. C. Gold Fields, Limited, of Nelson, B.C., killed by an explosion of dynamite, in the Murray Hill Hotel, New York on 27th January. Mr. Robertson was one of the most widely known and respected mining men in British Columbia. A shrewd, far-seeing, highly capable man of business, genial, kindly and generous in disposition, "Rod." Robertson was greatly liked by every one and the conspicuous success of the large mining corporation of which he was the active head, was very largely due to his enterprise and ability.

MEMBERS SERVING IN SOUTH AFRICA.

In my last report attention was called to the fact that four members of the Institute were with different regiments in South Africa. Captain J. Edwards Leckie, D.S.O., M.E., of Greenwood, B.C., who served with distinction as an officer in Strathcona's Horse, accompanied by his brother Captain R. G. Leckie, M.E., of Vancouver, B.C., and Captain Bruce Carruthers of Kingston, all members of the Institute, have again volunteered their services on behalf of the Empire and are now serving in South Africa with the 2nd Canadian Mounted Rifles. Major Hamilton Merritt who has gone out as second in command of this fine regiment is also a well known Canadian Mining Engineer and at one time was a member of the Council of the Institute.

MEETINGS AND PUBLICATIONS.

The Annual Meetings of the Institute were held at Montreal on 6th, 7th and 8th March and were, as usual, exceedingly well attended. Twenty-three papers were presented and these, together with the transactions of the Institute during the year, constitute the fourth volume of our Journal published and distributed to members in June. This volume was widely distributed among the principal British, American, European, and Colonial mining societies and it was favorably noticed by the leading mining journals, a number of them reprinting some of the papers.

The other publications were: 500 copies of the Secretary's Annual Report; 300 copies of Dr. Adam's paper on the "Iron Ores of Bilbao;" 50 copies of Professor Miller's paper on the "Iron Ore Fields of Ontario;" and 500 copies of the List of Members.

STUDENT'S COMPETITION.

Three very creditable papers were presented to our transactions in competition for the President's prize, the Council ultimately awarding the medal to Mr. C. V. Corless, of McGill, for his description of the "Coal Creek Colliery" of the Crow's Nest Pass Coal Co.

SUMMER EXCURSION.

Very complete arrangements were made for an excursion during the first week of September to the nickel, copper and iron mines of Sudbury and Sault Ste. Marie returning by way of the Hastings County gold mines, but as it was found impossible at the time to get such an attendance of members as this important field warranted the event was postponed.

LEGISLATION.

In accordance with a resolution adopted at the Annual Meeting a deputation from the Institute had an interview at Ottawa with the Premier, the Right Hon. Sir Wilfrid Laurier, and other Ministers, and asked for the disallowance of the "Act to Amend the Mines Act" adopted by the Ontario Government in 1900, imposing prohibitory taxation on copper and nickel ores. It is satisfactory to know that while the Dominion Government did not disallow the Act its constitutionality will be made the subject of a special test case between the two Governments at no very distant date.

LIBRARY AND READING ROOM.

Our collection of books, periodicals, maps, photographs, etc., has been considerably extended during the year, the following, among other works on mining and metallurgical practice being added: Schnabel's "Metallurgy," two vols.; Locke's "Gold Milling;" James on "The Cyanide Process," and Vol. IX of the "Mineral Industry." A large number of exchanges and periodicals were also bound and the photographs suitably framed. This collection, now a very valuable one, has attained such dimensions that the present quarters in the Windsor Hotel are becoming too small for its proper accommodation and it will be necessary very soon to seek additional premises either in the hotel or elsewhere.

The Report was adopted.

RESOLUTIONS OF SYMPATHY.

Mr. WM. BLAKEMORE having referred in feeling terms to the loss sustained by the death of Mr. J. Roderick Robertson moved the following resolution:—

"That the Canadian Mining Institute in Annual Meeting assembled desires to place on record its sense of the serious loss sustained by this Institute and by the mining community of British Columbia in particular through the lamented death of the late MR. RODERICK ROBERTSON and wishes to extend to his family its sincere sympathy in their bereavement."

The CHAIRMAN referring to their late co-worker Mr. James F. Lewis, intimated that he hoped to contribute to their Transactions an obituary note referring to his services to the mining industry and to the Institute.

TREASURER'S REPORT.

Mr. J. STEVENSON BROWN presented his statement of accounts duly audited covering the year ended 31st. January showing: Receipts \$4590.61; Disbursements \$3,633.21; Cash balance on hand \$957.40.

The report was adopted.

AMENDMENTS TO BY-LAWS.

The SECRETARY submitted copy of the By-Laws containing certain amendments recommended by the Council.

These were on motion adopted.

CANADIAN SOCIETY OF CIVIL ENGINEERS' BILL.

The CHAIRMAN—The Canadian Society of Civil Engineers is again seeking legislation in the Ontario and Manitoba Legislatures with the object of making it a close corporation in these Provinces. The bill was considered at a meeting of the Council last evening and it was decided to refer further action upon it to this meeting.

Mr. COSTE—The Bill is not so bad as it used to be. The exemption of the members of our Institute and those engaged in mining seems to cover the ground very well.

Mr. BELL—Let the other engineers—those who are not members of the Society—fight it if they want to.

The CHAIRMAN—When we look at this thing as members of the Institute we have no kick coming.

Dr. ADAMS—As an Institute we can guard ourselves as individuals.

Mr. BLAKEMORE—In the practice of my profession I may be called upon to survey or build a railroad. Would I not be required, under this Bill, to belong to the Canadian Society of Civil Engineers?

Dr. W. L. GOODWIN—I think the Institute has one or two courses open to it with regard to this Bill. In Section 2 "No person shall be entitled within the Province of Ontario . . . to act or practice as a civil engineer"; the term Civil Engineer is not defined here or elsewhere in the Bill. In Sec. 4 we find "All By-Laws of the Society shall be valid and shall be deemed to apply"—if enacted would this not give the Canadian Society of Civil Engineers what would amount to legislative powers? With regard to definitions, examination of the Quebec Act shows that the Society defines a C. E. to cover every kind of engineer whatsoever and there is nothing in this Bill to prevent them, if the Bill becomes law, from defining it in the same way in Ontario. In Section 2, Clause D "unless he is entitled to do so as the holder of a diploma or of a degree conferred by some institution of learning in the Dominion of Canada so to do." In this clause, the words "unless he is entitled to do so" are indefinite and Section 4 would give the Society power to make all By-Laws, define the kind of diploma or degree which would entitle the engineer to practice as a C. E. (also defined by the By-Laws of the Society). Section 2, Clause E together with Section 4 would give the power to apply any test whatever to engineers coming into Canada from Great Britain or the United States and while I do not wish to impute any unfairness or motive it would manifestly be unwise to give such powers to a Society which represents only a section of the engineering profession. Section 8 is as broad and fair as a qualification could possibly be made. It reads "This Act shall not be deemed to apply to members of the Canadian Mining Institute in so far as concerns their operations as mining or metallurgical engineers or in any way whatever in the management or operation of mines or metallurgical works." This power can be worked so as to inflict hardship on mining engineers and metallurgical engineers and on their employers. Had this Act been in operation during the past two years it might have been used to prevent, or to interfere with the designing and construction of the extensive projects and shipping facilities of the Helen iron mine under the provision of "Any other than a member of the Canadian Society of Civil Engineers." The whole objection to the Bill can be summed up as follows:—It must be first shown that legislation is necessary and that the engineering profession is suffering from the lack of it, and when this is established it must then be shown that it would be wise to confer such powers to a body duly representing a section of the engineering profession of Canada. I contend that such action would neither be wise nor just. If restrictive powers are to be given at all they should be given to some Society or Association which represents the whole engineering profession. Therefore, Gentlemen, I think the duty of the Institute is plain, not to touch the Bill at all in any way but let it meet its fate in the Ontario Legislature. (Applause.)

Mr. J. STEVENSON BROWN—The whole mining interests of Ontario might be prejudiced by the passing of this Act and it is our duty to oppose it.

Mr. B. T. A. BELL—The Bill hasn't got a thousand to one chance of passing anyway.

The CHAIRMAN—After hearing Dr. Goodwin's very lucid statement of object-

ion to the present Bill it seems to me to be the duty of the Institute to enter the fight again.

Dr. ADAMS—While fully approving of what Dr. Goodwin has said it seems to me we are expressly exempted as mining engineers from the operations of this Act. The supposition of Mr. Blakemore that he would be denied the right to design or construct a railway or dam seems to be very fully provided for by the exemption in favor of members of our Institute.

Dr. GOODWIN—The clause under C. E. in this Act is to be interpreted by the By-Laws of the Canadian Society of Civil Engineers. My objection is that the Act relegates to this Society, a body only representing a section of the engineering profession, powers which can by these By-Laws be made to apply to the whole profession.

After some further discussion the Secretary, on motion, was instructed to wire the Chairman of the Private Bills Committee in Ontario and Manitoba Legislatures protesting against the passage of any such legislation in favor of the Canadian Society of Civil Engineers.

SCRUTINEERS APPOINTED.

On motion, Messrs. H. W. DeCourtney and W. Blakemore were appointed Scrutineers for the election of officers.

APPOINTMENT OF AUDITORS.

On motion, Messrs. George Macdougall and H. W. DeCourtney were re-elected auditors for the ensuing years.

SUMMER EXCURSION.

The SECRETARY suggested that the excursion postponed last year, visiting the Sudbury, Sault St. Marie and Hastings County mining districts be, if possible, carried out this year. He also suggested that as these districts would be of particular interest to them, the members of the Lake Superior Mining Institute might be invited to participate in these excursions as the guests of the Institute.

Mr. COSTE—It would be to our advantage to have them with us.

The suggestion meeting with hearty approval of the members it was agreed to leave the details in the hands of the Secretary.

The meeting adjourned at one o'clock.

TUESDAY AFTERNOON.

The members assembled in the Club Room at three o'clock, Mr. J. E. Hardman in the Chair.

The CHAIRMAN, having called the meeting to order, expressed the regret of himself and the members at the unavoidable absence through illness of their President Mr. Chas. Fergie.

The following papers were read by title:—

1. Notes on Gold Dredging.
By F. Satchell Clarke, Vancouver, B.C.
2. On a Method of Mining Low Grade Ore in the Boundary District, B.C.
By Frederic Keffer, M. E., Anaconda, B. C.
3. On The Copper Bearing Rocks of the Eastern Townships.
By John A. Dresser, M. A., Richmond, Que.
4. On the Analysis of Insolubles.
By Douglas Lay, A. R.S.M. Nelson, B.C.
5. Notes on Wire Ropes.
By W. D. L. Hardie, M. E., Lethbridge, N.W.T.
6. Notes to Accompany Plan and Drawings of the Athabasca Mine, Toad Mountain, B.C.
By E. Nelson Fell, A.R.S.M., London, England.

ORES OF THE BOUNDARY DISTRICT.

Mr. R. W. BROCK of the Geological Survey gave an interesting address on the geological features and character of the ores of the Boundary Creek District of British Columbia.

A paper by Dr. Ledoux of New York on Copper Production in the same district was taken as read, Dr. Ledoux being unable to reach Montreal in time for the meeting in consequence of the floods.

DAWSON AND SELWYN PORTRAITS.

The CHAIRMAN—Before going on with the papers I would like to call your attention to the fact that we have with us the Acting Director of the Geological Survey, Dr. Robert Bell, and in the absence of the President, it becomes my duty to present to him for the Survey the portraits of two of its former Directors. These portraits were purchased by funds entirely separate from the Institute. We all recognize the great services rendered by them to make known the mineral wealth of this country. I have much pleasure in presenting them to the Survey on behalf of the Institute.

Dr. ROBERT BELL—I have to thank you all for your liberality in subscribing to the funds for these two splendid portraits of my predecessors—Dr. Selwyn and Dr. Dawson. The former was Director for twenty-five years and before that held posi-

tions in Australia and Great Britain. Dr. Dawson was on the Survey since 1875 and was Director for the last six years. The portraits will be very welcome to us. We have the portrait of Sir William Logan and now with these will make the three Directors. I have only again to thank you for the kindly thought which prompted the presentation of these portraits.

PRESENTATION OF THE STUDENT'S MEDAL.

The CHAIRMAN—Then called for Mr. C. V. Corless, an undergraduate of McGill, and on behalf of Mr. Fergie presented him with the President's gold medal awarded by the Council for the best paper contributed during the year to the Transactions of the Institute.

Mr. Corless briefly and suitably replied.

MINING PROGRESS IN CANADA DURING 1901.

Mr. B. T. A. BELL—Last year in my Annual Report to the members I incorporated a review of the principal features of our mining progress during the previous year. That statement was found to be of some service to the members and is my excuse for again presenting to you such authentic figures as I have been able to gather together respecting the mineral development of the Dominion during 1901. From figures furnished direct to me by the courtesy of the mine managers, and the returns given by the various Provincial Bureaus of Mines, a conservative estimate would place the total value of the mineral production of the Dominion in 1900 at a little over seventy millions of dollars, distributed as follows:—

YUKON.	
Gold, Silver, Coal	\$18,500,000
BRITISH COLUMBIA.	
Gold, Silver, Copper, Lead, Coal, Coke, etc....	20,713,501
ALBERTA, ASSINIBOIA, MANITOBA.	
Coal, Gold, Gypsum, Platinum, Building Material	1,700,000
ONTARIO.	
Copper, Nickel, Iron, Steel, Gold, Silver, Zinc, Arsenic, Corundum, Natural Gas, Petroleum, Salt, and other products.....	11,712,188
QUEBEC.	
Asbestos, Iron and Steel, Chromite, Graphite, Mica, Ochres, Barytes, etc.....	3,500,000
NEW BRUNSWICK.	
Copper, Manganese, Coal, Gypsum, Building Material etc	1,000,000
NOVA SCOTIA.	
Coal, Coke, Iron, Steel, Gold, Gypsum, Grind.tones, Building Material.....	13,000,000
Estimated Total Mineral Production of the Dominion of Canada in 1901.....	<u>\$70,125,689</u>

COAL.

In its relative value to the trade and commerce of the country the greatest of our mineral industries is unquestionably the production of coal which shows a considerable increase in tonnage and values over any previous year in the history of coal mining in Canada. From figures furnished direct to me from the collieries a close estimate would place the total quantity of coal mined in Canada in 1901 at 5,748,845 tons of an estimated value at the pithead of not less than \$18,000,000. The distribution of this output was as follows:—

From Nova Scotia	3,834,360 tons.	
“ British Columbia.....	1,529,210 “	
“ Alberta, Assiniboia and Manitoba....	370,275 “	
“ New Brunswick.....	10,000 “	
Yukon.....	5,000 “	
Total Coal Raised in 1901.....	5,748,845 tons.	<u>5,748,845 tons.</u>
Bituminous Coal imported during the year	3,135,158 “	
Total Bituminous Coal.....	8,884,003	8,884,003 tons.
<i>And Exported</i>		
To Great Britain.....	29,909 “	
“ United States... ..	1,395,142 “	
“ Newfoundland.....	83,153 “	
“ Other Countries	65,457 “	<u>1,573,661 tons.</u>
We also imported Anthracite Coal.....		7,310,342 “
		<u>2,024,383 “</u>
Making the total consumption of coal in the Dominion during the past calendar year.....		<u>9,334,725 tons.</u>

COKE.

The product of our coke ovens will also show a considerable increase. Returns show the output from Nova Scotia to have been 241,936 tons and from British Columbia 134,760 tons, or a total coke output of 376,696 tons. During the year we exported 57,505 tons and imported 652,710 tons.

IRON AND STEEL.

As Mr. Drummond will, doubtless, deal very fully with these industries in his paper, I will only briefly summarize the returns forwarded to me, showing as they do a very marked and extremely gratifying expansion over previous years.

ORE PRODUCTION.

<i>Province of Nova Scotia:—</i>			
Mined by Nova Scotia Steel Co.....		18,619 tons.	
<i>Province of Quebec:—</i>			
Mined by Canada Iron Furnace Co.....	11,808 tons.		
Shipped by Ottawa & Gatineau Valley Railway	750 "		
Other estimated.....	1,000 "	13,558 "	
<i>Province of Ontario:—</i>			
Mined by Lake Superior Power Co.....	261,203		
Shipped from Madoc via G.T.R.....	305 "		
" " Trenton via G.T.R.....	2,134 "		
Add difference to balance figures reported by Bureau of Mines.....	8,896 "	272,538 "	
Total Iron Ore mined in Canada in 1901....		<u>304,715 "</u>	

IRON ORE IMPORTED.

<i>By Dominion Iron and Steel Co:—</i>			
From Spain	23,411 tons.		
" United States	16,428 "		
" Cuba	11,191 "		
" Newfoundland	385,329 "	436,359 tons.	
<i>By Nova Scotia Steel and Coal Co:—</i>			
From Newfoundland	32,801 tons.		
" Cuba	117 "	32,918 "	
<i>By Canada Iron Furnace Co:—</i>			
From United States.....	9,275 tons.	9,275 "	
<i>By Hamilton Steel and Iron Co:—</i>			
From United States.....	56,849 tons.	56,849 "	
<i>By Deseronto Iron Co:—</i>			
From United States.....	17,602 tons.	17,602 "	
Or total Ore Imports of.....		553,003 tons.	

RECAPITULATION.

From Newfoundland.....	418,130 tons.		
" United States.....	100,154 "		
" Cuba.....	11,308 "		
" Spain.....	23,411 "	<u>553,003 tons.</u>	

IRON ORE EXPORTED.

During the calendar year we exported as per Trade and Navigation Returns 306,244 tons of iron ore of an estimated value of \$774,673.

PIG IRON MADE.

<i>Province of Nova Scotia:—</i>			
Dominion Iron and Steel Co.....	111,014 tons.		
Nova Scotia Steel and Coal Co.....	26,793 "	137,707 tons.	
<i>Province of Quebec:—</i>			
Canada Iron Furnace Co.....	5,400 tons.		
Macdougall & Co.....	656 "		
Electrical Reduction Co.....	300 "	6,356 "	
<i>Province of Ontario:—</i>			
Canada Iron Furnace Co.....	33,648 tons.		
Deseronto Iron Co.....	9,975 "		
Hamilton Steel and Iron Co.....	67,512 "	111,135 "	
Total Pig Iron made in Canada.....		<u>255,198 tons.</u>	

PIG IRON EXPORTED.

Trade and Navigation Returns show that 57,600 tons of a value of \$593,739 were exported during the calendar year.

STEEL MADE.

<i>Province of Nova Scotia:—</i>	
Nova Scotia Steel and Coal Co., Ingots.....	25,678 tons.
<i>Province of Ontario:—</i>	
Reported by Bureau of Mines.....	14,471 tons of a value of \$347,280
Total Steel made.....	40,159 tons

IRON AND STEEL BOUNTIES PAID.

The following bounties were paid by the Dominion Government during the fiscal year ended 30th June last:—

ON PIG IRON.

<i>Canada Iron Furnace Co:—</i>	
Radnor Forges—	
Production to June 30th, 1901—	
5,463,945 tons from Canada ore at \$3.....	\$16,391 83
111,565 tons from foreign ore at \$2.....	223 13
<i>Midland, Ont:—</i>	
Production 7 m. to June 30th, 1901—	
18,948,10 tons from Canada ore at \$3.....	56,844 30
1,162,525 tons foreign ore at \$2.....	2,325 05
<i>Deseronto Iron Co:—</i>	
Production 14 m. to June 30th, 1901—	
54 tons from Canada ore at \$3.....	162 00
13,653 tons from foreign ore at \$2.....	27,306 00
<i>Dominion Iron and Steel Co:—</i>	
Production 5 m. to June 30th, 1901—	
27,643,695 tons from foreign ore at \$2.....	55,287 39
<i>Electric Reduction Co., Buckingham:—</i>	
Production January, 1900 to April, 1901—	
391 tons from Canada ore at \$3.....	1,173 00
<i>Hamilton Steel and Iron Co:—</i>	
Production 13 m. to June 30th, 1901—	
15,033,16 tons from Canada ore at \$3.....	45,099 48
38,678,07 tons from foreign ore at \$2.....	77,356 14
<i>John McDougall & Co:—</i>	
Production January 1st to May 14th, 1901—	
79,315 tons from Canada ore at \$3.....	2,379 46
<i>Nova Scotia Steel and Iron Co:—</i>	
Production 13 m. to June 30th, 1901—	
9,897,295 tons from Canada ore at \$3.....	29,691 88
18,509,705 tons from foreign ore at \$2.....	37,019 41
	<u>\$351,259 07</u>

BOUNTY ON PUDDLED BARS.

<i>Hamilton Steel and Iron Co:—</i>	
Production 13 m. to June 30th, 1901—	
5,567,695 tons at \$3.....	\$16,703 09

BOUNTY ON STEEL INGOTS.

<i>Hamilton Steel and Iron Co:—</i>	
Production 13 m. to June 30th, 1901—	
9,436,985 tons at \$3.....	28,310 96
<i>Nova Scotia Steel Co:—</i>	
Production 13 m. to June 30th, 1901—	
23,915,595 tons at \$3.....	71,746 78
	<u>\$100,057 74</u>

IRON AND STEEL EXPORTS.

(As per Trade and Navigation Returns.)

Stoves.....	\$ 7,438
Castings.....	67,140
Machinery.....	470,136
Sewing Machines.....	18,279
Scrap.....	168,438
Hardware.....	95,213
Steel.....	416,796
Bicycles.....	381,569
Parts Bicycles.....	78,547
Total exports.....	<u>\$1,703,556</u>

OUTPUT OF GOLD.

From Yukon	\$18,000,000
“ British Columbia	5,596,700
“ North West Territories	40,000
“ Nova Scotia	620,000
“ Quebec	1,440
“ Ontario	244,443
Total gold production	<u>\$24,502,583</u>

OUTPUT OF COPPER.

From British Columbia	\$4,951,698
“ Ontario	627,080
“ New Brunswick	100,000
Total copper production	<u>\$5,678,778</u>

IMPORTS OF COPPER.

Scrap	\$ 6,133
Ingots	121,562
Bars	593,344
Sheets	270,591
Tubing	42,729
Rollers	10,111
Rivets	6,828
Wire	99,540
Cloth	604
Other	49,405
	<u>\$1,200,847</u>

OUTPUT OF LEAD.

British Columbia	50,529,260 lbs. of a value of	\$1,970,641
Quebec shipped	554,000 “ “ “	11,350
	<u>51,083,260 lbs.</u>	<u>\$1,981,991</u>

LEAD IMPORTS.

Pig	\$137,561
Bar	69,178
Pipe	11,293
Shot	1,932
Other	53,105
Nitrate	12,533
Tea	50,145
	<u>\$335,747</u>

NICKEL MATTE.

Ontario, as reported by Bureau of Mines	\$627,080
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SILVER.

From British Columbia, 4,685,718 ozs. of a value of ...	\$2,624,002
“ Yukon	125,000
“ Ontario, 151,400 ozs. of a value of	84,830
“ Quebec (in concentrates) estimated	5,000
Total silver production	<u>\$2,838,832</u>

The quantity exported as shown by Trade and Navigation Returns was 3,513,500 ounces of a value of \$2,016,727, and bullion exported during the first six months of the year of a value of \$8,865 or a total of \$2,025,592.

ASBESTOS PRODUCTION.

The production of this valuable mineral is entirely confined to the Province of Quebec and during 1901 was the largest in quantity and value since this industry was established in the early eighties. Returns of shipments show :-

<i>Via Quebec Central Railway :-</i>	
From Coleraine	64,000 lbs.
“ Black Lake	9,520,551 “
“ Thetford Mines	48,431,750 “
	<u>58,016,301 lbs. or 29,008 tons.</u>
<i>Via Grand Trunk Railway :-</i>	
From Danville	5,468 “
<i>Via Ottawa Northern and Western :-</i>	
From Low	40,880 lbs. or 20 “
Total Asbestos shipped	<u>34,496 tons.</u>

ASBESTIC.

<i>Via Quebec Central Railway :-</i>	
From Black Lake	2,301,040 lbs. or 1,150 tons.
<i>Via Grand Trunk Railway :-</i>	
From Danville	4,758 “
Total Asbestic shipped	<u>5,908 tons.</u>

Of these shipments, Mr. Obalski, the Government Inspector of Mines has sent me the following distribution by grades :-

No. I	2,083 tons of a value of	\$348,579
No. II	2,660 “ “	263,855
Fibre	14,659 “ “	450,193
Paper stock	14,054 “ “	211,688
Asbestic	6,831 “ “	10,114
Total	40,287 “ “	<u>\$1,284,429</u>

These shipments were to Great Britain, United States, Germany, France and other countries.

COPPER PYRITES.

The production of this mineral which for many years has been confined to the Eustis and Nichols mines in the Eastern Townships of the Province of Quebec was augmented in 1901 by two new sources of supply in the same district and by the output from a promising mine in the Township of Massey, Ontario. A portion of this was utilized for the manufacture of sulphuric acid and other chemicals in Canada. The value of the year's production would probably approximate about \$160,000 of which Mr. Obalski estimates that \$126,000 came from the Province of Quebec.

CHROMITE.

The Eastern Townships of Quebec, as in former years, furnish the output of this mineral, which may be placed at \$50,000. Mr. Obalski estimates that the shipments of No. I grade amounted to 528 tons of a value of \$9,424 and 610 tons of No. II valued at \$7,320 with a balance on hand at the end of the year of 350 tons of No. I and 3,200 tons of No. II. It is worthy of note that several hundred tons have been used at Buckingham by the Electrical Reduction Company in the manufacture of ferro-chrome. One of the many remarkable things brought out by an examination of the Trade and Navigation Returns is that these quote the shipment of 759 tons at a valuation in excess of \$30.00 per ton, a figure entirely out of proportion to the market prices for this mineral.

MICA.

The production of Mica was, as in previous years, confined to the Provinces of Ontario and Quebec and in 1901 would approximate \$200,000. A feature of the year was the largely increased home consumption of mica for electrical insulation, its use in the manufacture for boiler coverings, and the steadily growing demand for it in Great Britain and on the Continent. The exports during the calendar year were:-

To	Cut.		Trimmed.	
	Lbs.	Value.	Lbs.	Value.
Great Britain	54,199	\$17,024	47,750	26,394
United States	203,537	49,846	11,329	1,547
Other Countries	4,440	1,690	3,230	427
	<u>262,176</u>	<u>68,560</u>	<u>62,309</u>	<u>28,368</u>
To	Untrimmed and Ground.		Total.	
	Lbs.	Value.	Lbs.	Value.
Great Britain	20,160	5,070		48,488
United States	269,856	49,834		101,227
Other Countries	4,285	721		2,838
	<u>294,301</u>	<u>55,625</u>		<u>152,553</u>

GRAPHITE.

This industry, although still not a very large one, gives evidence of growth and promises to assume larger dimensions in the near future. The bulk of the production in 1901 came from Ontario but the acquisition of the strong company recently organized in the United States to work the Walker Mine at Buckingham, Que., should give an impetus to the production of this valuable mineral during the present year. The exports during the calendar year are reported to have been 21,653 cwt. of a value of \$35,102. During the same period we imported plumbago, crucibles and other manufactures of graphite of a value of \$55,564.

PHOSPHATE.

The production of this, at one time, one of the prominent mineral industries of the Dominion, was, as last year, confined to the quantity raised as a by-product of mica mining in the Provinces of Quebec and Ontario and probably did not exceed a value of \$10,000 of which Mr. Obalski estimates that \$6,280 was furnished by Quebec. It is, however, significant that the Trade and Navigation Returns show an import of this mineral from the United States of a value of \$8,219 presumably for the Electrical Reduction Co. at Buckingham, Que., once the great centre of phosphate production in Canada.

OTHER MINERALS.

Trade and Navigation Returns for the year show the other exports to have been:—Felspar 4,369 tons of a value of \$10,973; Antimony (from Quebec) 10 tons of a value of \$1,643; Manganese 440 tons of a value of \$4,820; Slate 16,750 tons of a value of \$10,000; Salt 39,224 bushels of a value of \$6,510; Ochres 801,553 lbs. of a value of \$7,233; Gypsum crude 235,995 of a value of \$231,385; manufactured ditto of a value of \$15,333; Oil crude and manufactured, \$36,425; Granite, Limestone, Bricks and other building materials \$158,066; Grindstone crude and dressed, \$8,688.

BRITISH COLUMBIA.

This Province occupied the leading position among the mineral producing territories of the Dominion, the value of her mineral production in 1901 having increased from \$16,344,751 in the previous year to \$20,713,501. Mr. W. F. Robertson, the Provincial Mineralogist, in a bulletin issued last month, estimated the quantity and value of the various products as follows:—

	1900.		1901 (Estimated).	
	Quantity.	Value.	Quantity.	Value.
Gold, placer.....ozs	63,936	\$1,278,724	43,204	\$892,500
“ lode..... “	167,153	3,453,381	227,696	4,704,200
Silver..... “	3,958,175	2,309,200	4,685,718	2,624,002
Copper..... lbs.	9,997,080	1,615,289	30,736,798	4,951,698
Lead..... “	63,359,621	2,691,887	50,529,260	1,970,641
Coal.....long tons	1,439,595	4,318,785	1,529,210	4,587,630
Coke..... “	85,149	425,745	134,760	673,800
Other materials.....		251,740		309,030
Totals.....		\$16,344,751		\$20,713,501

Writing to me under date of 1st February, Mr. Robertson briefly reviews the features of the year's progress, as follows:—

“ This estimate, I am satisfied, will be found ‘ within the mark ’ when the final statistics are completed. It will be seen that the total gross value of the output, including coal, etc., has this past year increased some 25 per cent., while the product of the lode mines has increased from \$10,069,757 to \$14,250,541, or about 40 per cent. The tonnage of the lode mines for 1901 is estimated at 909,223 tons as against 554,796 in 1900, an increased output of about 64 per cent.

The value of the coal and coke industry is estimated as \$5,261,430, as against \$4,744,530 for 1900, an increase of over 10 per cent., and this is limited only by the limited market and defective transportation facilities, matters soon to be remedied.

These figures speak rather eloquently of the progress of the Province as a mineral producer. To review the Province by districts:—

As yet the *Northern districts* are entirely placer gold producers, and this year there is a decrease of some 35 per cent. in placer gold output. This is to be accounted for as follows:—

In *Atlin district* the camps are about changing from sluicing to hydraulic methods, and the couple of hydraulic plants expected to have made an out-put were tied up by legal squabbles between themselves and also with the owners of individual claims.

The *Chilkat section* has done nothing, partly owing to excessive rainfall, causing floods which three times washed away all works.

In the *Cariboo district* the hydraulic mines, notably the Consolidated Cariboo Hydraulic Company, found themselves short of water supply during the last part of the season, owing to the sudden warm weather in spring carrying off the snow very rapidly and so leaving no supply for the later months.

In *East Kootenay* lode mining is largely confined to low grade silver-lead ores, and the market price for such ores has been so exceedingly low as to leave little, if any, profit to the mines.

This is one of the most serious problems in the Province to be faced and cannot be here discussed. Relief from these conditions is hoped for by the establishment of a lead refinery now under construction. This section would have shown a considerable decrease but for the increased output of coal and coke.

IN WEST KOOTENAY.

Slocan has about held its own both in tonnage and values, the higher silver contents of the Slocan ores enabling shipments to be made despite the low market for lead-bearing ores.

Nelson is expected to make a very considerable increase owing to the increased

out-put of gold ores and to the resumption of shipping of ore from the Silver King mine (Hall Mines Ltd).

Trail Creek has always been a “ storm centre ” and had its share of labor troubles, but, somehow or other, the yearly out-put has increased despite certain stoppages.

In *Yale district* productive mining is practically confined to the *Boundary* section, where the enormously increased output of very low grade copper-gold-silver ores has been brought about by the establishment of transportation and smelter facilities.

The *Coast district* has about held its own both in coal and lode mining, a number of copper properties have come forward and promise much for the future.

The increase in production during the past year has been a very agreeable surprise to most people, so persistent have been the attempts on the part of certain unsuccessful operators to circulate reports to the contrary effect.

The so-called “ labour question ” has caused much uneasiness, but I think such is unwarranted. There is no doubt but that the mine labour obtainable in the Province is, on the average, very poor, chiefly through inexperience. Under normal conditions this would soon remedy itself, but when the tonnage out-put increases at the rate of 64% per annum it is quite impossible to expect that miners can be trained at that rate.

The rates of wages for this class of labor are very high as compared with the other provinces of the Dominion, but the demand for such labour is so great that it is no wonder that the men demand, and get, high wages.

It is recognized that many of the low grade properties cannot go on paying such wages; this means a delay until conditions are readjusted by time and an increased population. The only important strike that occurred during the year was in the Rossland camp, and this, I am glad to say, has been adjusted.”

YUKON TERRITORY.

While there has been a shrinkage in the value of the gold production, the progress of mining in the Yukon has been entirely satisfactory, the total output during the past year being estimated at about eighteen and a half millions of dollars, as follows:

Gold dust and bullion received at Government Assay Office	
Seattle.....	\$10,915,000
Purchased by United States Mint and Selby Smelting Company, San Francisco.....	6,680,000
Add dust not reported and dust used in Territory as a medium exchange say.....	1,000,000
Or an estimated production of.....	\$18,500,000

The production during the preceding years was:—1897, \$2,500,000; 1898, \$10,000,000; 1899, \$17,500,000, and in 1900, \$28,000,000. A district which has produced over \$73,000,000 in five years must take rank not only as Canada's greatest gold-field but as one occupying a leading position among the gold-fields of the world.

Mining in the Yukon territory has been assuming a condition of much greater stability than prevailed during the previous years, and among the men who are acquainted with or are interested in the Klondyke gold fields there is a greater feeling of confidence and assurance that the richness and extent of the gold-bearing area is only just beginning to be truly appreciated. It is quite true that some of the richest spots on Eldorado and Bonanza Creeks have been almost worked out, often quite regardless of the cost at which the work was being prosecuted, for, let the working costs be ever so high, these costs still, in the cases of some of the richest claims, amounted to but a small percentage of the gross output of the mines. Although these claims are now seriously depleted, and although there may be no other part of the Territory where three miles and a half of a creek valley will yield twenty-five or thirty million dollars' worth of gold, as Eldorado Creek has done, still there are extensive tracts, in the bottoms of valleys, and on terraces along their sides underlain by gravel rich in gold, from which the precious metal will be washed out in large quantities for many years to come. The existence of the very rich pockets, such as those on Eldorado Creek, encouraged extravagance of every kind, but with the depletion of these profits, and the realization of the idea that the wealth of the country lies chiefly in its lower grade gravels, better machinery and organization and more economical methods have been introduced, and the district is entering a state of solid and quiet prosperity, founded on moderate profits, and moderately remunerative work for a large number of people, rather than on excessive profits and very high wages for a few.

In 1898 the method of mining all the deeper gravels, which are frozen from the surface down to bed rock, and far into bed-rock, was, in winter, to pick down through the frozen wall or “ muck,” then build fires in the bottom of the shaft so begun, and shovel out the gravel so thawed until bed-rock was reached. At the bottom of the shaft so sunk fires were laid against the sides of the gravel, and drifts were carried from thirty to forty feet away from the shaft, the ground thawed and mined being

hoisted by handwindlasses and piled in dumps to be washed when the streams began to flow in the spring. In most cases the wood used was hauled to where it was needed by dogs. As the ordinary rate of wages for labor of all kinds was \$1 an hour, this style of mining was very expensive, and none but the richest ground would pay a profit over working expenses. The next year thawing by steam was introduced, small boilers were taken to the mines, and used, not only to thaw the ground, but also to operate hoisting engines to raise the pay-dirt mined in the drifts to the surface. Then larger boilers were imported, pumps were set up to pump water, when water by gravity was difficult to obtain, and, finally, pulsometers were installed underground to pump hot water against the face of the gravel, and thus thaw the pay-dirt with hot water instead of with steam. While at first this underground mining was all done in winter, now, with the use of steam or hot water it can be done either in winter or in summer, and, if in the latter season, the pay-dirt can be mined, hoisted, dumped from self-dumping buckets into sluice boxes, and the gold washed from it in one continuous operation. During the past summer, most of the men who went to the Yukon were laborers who went with the intention of working for wages and making the best living possible. Many of the old-timers brought in their wives and families, and a spirit of general contentment has taken the place of the grumbling, unrest, and discontent of previous years.

In his report to the Hon. the Minister of the Interior the Hon. James H. Ross, Commissioner of the Territory, points out that the great requirement of the Territory is cheaper transportation. Every reduction in freight rates, every reduction in the cost of living in the Yukon makes possible the introduction and operation of a higher class of machinery and cheaper production of gold. At the present time, ground that could not be worked at a profit a year or two ago can now be successfully mined. It is confidently anticipated that large areas which have already been mined to the full extent that they probably could be at the time they were mined under the then existing conditions can soon be wholly re-worked at handsome profits. Transportation has been the serious obstacle to cheap mining. The expense, not only of getting things into the country, but of moving them from one place in the country to another, has been enormous. Many instances can be furnished where thrice, four, five, and ten times the cost paid for an article at Vancouver or Victoria for getting that article into position on some mining claim twenty or thirty miles from Dawson. He has endeavoured to aid in the cheapening of transportation within the Territory by providing for the expenditure of every available dollar upon the construction of a circle of roads connecting all the important mining creeks with Dawson, which is the centre of supply for the Territory. The road construction has been mapped out on a large scale, with the view of having each year's operations tend towards completion of a general system calculated to meet to the fullest extent the fullest possible needs of the people.

Last year, in this report, I referred to the development of the deposits of lignite on Rock Creek and Cliff Creek. The output of this coal during the year is estimated to have been about 5,000 tons, of a value at the pit of about \$50,000. Silver to the estimated value of \$125,000 was also won.

The total royalty collected up to 1st July last year, after deducting the exemption allowed by the regulations was \$2,192,645.41; of which \$596,368.03 was collected during the year ended 30th June last.

Up to July 1st, 1901 there were recorded 24,524 placer claims, 2,793 quartz claims, 16,573 renewals and relocations, and 25,020 assignments of claims. To the same period 59,449 free miners' certificates were issued, producing a revenue of \$596,168.62 and during the last fiscal year 12,511 miners' certificates were issued yielding a revenue of \$125,861.

Leases now in force to dredge for minerals in the submerged beds of rivers in the Yukon cover 270 miles. The total revenue received for leaseholds up to July 1st, 1901 was \$139,655.50 and for the last fiscal year \$2,650.

It is further worthy of remark that the general revenue from the Yukon during the year ended 30th June last, viz.: 2,011,311.07 is the largest on record, being an increase of \$207,787.01 over 1899-1900. The Government Assay office, established at Vancouver, treated up to 1st January last 465 deposits, representing 57,221 ounces gold of a value of \$939,654.41.

As an encouragement to miners to have their gold assayed at this office, the government has passed a regulation by which miners who personally deliver their gold at the office are refunded one per cent. on the net value of the gold upon which they have paid royalty, so that in the case of the rich miners the royalty is reduced to only four per cent.

GOLD DREDGING IN THE YUKON AND ON THE SASKATCHEWAN.

Leases now in force to dredge for minerals in the submerged beds of rivers in the Yukon cover 270 miles and in the North West Territories 911.75 miles. The total revenue received by the Dominion Government for dredging leases in the Yukon up to 1st July, 1901 was \$139,655.50 and for the fiscal year \$2,650. The total revenue

received for the rent of the leaseholds in the North West Territories up to July 1st, 1901 was \$20,262.71 and for the past fiscal year \$3,000.

On the Saskatchewan gold dredging is emerging from the experimental stage and gives promise of becoming a successful industry. Hitherto, the chief difficulty has been the saving of the fine gold but it is claimed that Mr. Hobson, the manager of the Saskatchewan Gold Proprietary, Ltd., who had two dredges, the Minto and Otter, at work intermittently on the river last season, has overcome this. Mr. McDonald, Chairman of the Universal Corporation and a New Zealand dredging expert of some standing, who has been supervising the operations of the Proprietary company claims that process of mining has centered down to one and one only successful method, that is the ladder and endless chain system.

Dipper dredges have been tried and found too slow; suction dredges have had their pipes cut out and the principle has been abandoned. The ladder and endless chain system has been the only one to prove successful. The Otter, Minto, and Alberta, the three dredges which were worked this summer, were fitted with this style of machinery, but none of them proved entirely satisfactory. The reason of this partial failure was not in the weakness of the principle but in the weakness of the machinery. The machinery had been designed in England by supposed to be competent mining engineers, but was found altogether too weak in parts to do the work which it was called on to do in dredging into solid gravel banks. Thus numerous breakdowns occurred and it was always some weak link in the machinery which was found to have given away. The Minto was launched on 4th of May, but it was not until July that the dredge could be got to work. She was run for only short intervals during the summer, the breakdowns being of frequent occurrence, and at last was condemned with her machinery and laid up for complete overhauling next season. The Otter made by far the best run of the three, though even she did not run like anything of her theoretical capacity. Probably at no time during the season did she run at more than ten cubic yards per hour, bar measurement. Her results would have necessarily have been much larger had she not been forced, through having no coal tender, to work on bars in the vicinity of the town which had been worked over by grizzley miners for the past thirty years.

The Minto worked about 2,000 cubic yards, her machinery being very unsatisfactory, and though much of the gold was lost, through these defects, she is reported to have saved at the rate of 28 cents per cubic yard. With all the dredges the amount of gold washed was not so great as it might be, but the amount of gold saved for each yard of gravel washed was quite satisfactory.

ALBERTA.

The output from the collieries at Anthracite and Canmore were 14,742 and 88,499 tons respectively, a total of 103,241 tons compared with 98,000 tons produced in the previous year. Lethbridge collieries of the Alberta Railway and Coal Co. also show an increase in production amounting to 35,233 tons, the output for the year being 217,034 tons as compared with 181,801 tons in 1900. The selling price of these coals f.o.b. at Winnipeg was \$9.00 for Anthracite and \$7.50 for bituminous coal.

Although the discovery of a first class coking coal along the line of the Crow's Nest Railway is not new, still nothing had been done towards its development till last summer, when the possibilities of profitable investment appears to have drawn the attention of capitalists to this field. The value of this coal, particularly to Eastern British Columbia where it can be utilized in the reduction of ores can hardly be estimated, while the coal measures are of such great extent that the working can hardly fail in time to be profitable. Mr. H. L. Frank and associates are expending a large amount of money in opening up their property at Blairmore.

ASSINIBOIA.

The production of lignite at Roche Percee will show an increase over previous years it being estimated that quite 43,000 tons were consumed in Manitoba and the Territories as far west as Regina. The selling price of this coal f.o.b. Winnipeg was \$3.75; at Melita \$2.60; at Brandon \$3.20; and at Regina \$3.30.

MANITOBA.

Of the large number of quartz claims taken up in 1898, 1899 and 1900 not more than fifty are to-day in existence and little or no development has taken place on any of them. Reference was made last year to the establishment of works by the Manitoba Union Mining Company for the treatment of Gypsum deposits located in the vicinity of the north eastern arm of Lake Manitoba and of the large deposit of natural cement in the Pembina Valley. Returns from the company show that the output of cement was about 5,000 barrels and the output of Gypsum 600 tons, and the management state that this output will be very largely increased during the present year. The price realized for the company's cement f.o.b. cars at Arnold, on the Morris Brandon branch of the C. P. R. is \$2 per ton; \$13 per ton was realized at Winnipeg for the output of Gypsum. A mill has been erected at a cost of \$15,000 and a steamer transports the plaster to Westbournes Delta, the terminus of the Canadian Northern Company's branch line at the southern end of Lake Manitoba.

At Lac du Bonnet, an elaborate brick plant has been established by the Lac du Bonnet Mining Developing and Manufacturing Company to exploit an extensive deposit of excellent clay. It is said that although the present daily output is only 30,000, the machinery has a capacity of 75,000 brick per diem. This deposit has been proved to be of value for the manufacture of brick, vitrified brick and drain tiles.

ONTARIO.

The mineral industry in Ontario made satisfactory, and in some branches, rapid progress during 1901. The chief metals characteristic of the Province are iron, nickel and copper, in all three of which large advances were made in quantity and value of output. The production of iron ore last year amounted to 272,533 tons as against 90,302 tons raised in 1900. The greater portion of the ore was from the Helen mine at Michipicoton owned by the Clergue interests. Search for other ore bodies has been very active. A large extent of "iron ranges" has been located, and energetic prospecting by diamond drills and otherwise is now going on. Sanguine men look for a duplication of the Mesabi and Vermillion ranges in Western Ontario. Three blast furnaces running steadily throughout the year made 116,370 tons of pig iron valued at \$1,701,703 as compared with 62,386 tons worth \$936,066 in 1900. Steel was produced by the open-heart process to the amount of 14,471 tons valued at 347,280 as against 2,819 tons worth \$46,380 the previous year.

The nickel mines of the Sudbury region increased the quantity of their output by 25 per cent. and the value by 130 per cent. The brisk demand and good prices which have prevailed during the year have led to more extensive operations, the matte which is now being produced being of much higher grade than formerly. The latter circumstance accounts for a considerable part of the increased value. During the year the Mond Nickel Company at Victoria Mines put their smelters in blast, and are now turning out an 80 per cent. matte by the bessemer process. The bulk of the production, however, remains at the credit of the Canadian Copper Company, whose low grade mattes are ground, calcined and re-smelted at the Ontario Smelting Works erected by Col. Thompson of the Orford Copper Company, which came into operation during the year. A noticeable feature of the year was the opening of the Creighton mine in the southwest corner of Snider township from which 500 or 600 tons of ore are being shipped daily to the smelters at Copper Cliff. This mine has every indication of proving to be an enormous deposit. The Manitoulin & North Shore Railway extending westward from Sudbury serves this mine as well as several other nickel properties, two of which, the Gertrude and the Elsie, are owned by the Lake Superior Power Company. A considerable tonnage of ore has been raised from these mines, and roast heaps have been inaugurated at the Gertrude of ore from both mines. Smelters are also to be erected there.

The yield of precious metals was somewhat smaller than in 1900, 14,293 ounces of gold worth \$244,443 being produced as against 18,767 ounces worth \$297,861 the previous year. The Mikado, Sakoose and Sultana mines in northwestern Ontario have remained steadily at work, and about the beginning of 1902 were joined by the Black Eagle, formerly the Regina, where a new thirty-stamp battery has been installed. In eastern Ontario the Deloro and Belmont mines have been doing good work. The production of arsenic at the former has also been greatly increased.

The yield of silver was 151,400 ounces worth \$84,830 as against 160,612 ounces valued at \$96,367 in 1900. Consolidation has recently taken place by which the West End, Porcupine, Badger, East End and Keystone mines have passed under the control of a new company. It is expected to undertake large operations and increase the present output.

The out-put of non-metallic minerals shows a small increase in value over 1900, the total being \$6,785,791 as against \$6,733,338. There was a decided increase in building materials, and a falling off in petroleum. The other principal items remain at pretty nearly the same level. The decrease in petroleum is partly due to the natural diminution in the output, which is about five per cent. less than in 1900, and in part to the fact that a larger proportion of crude than formerly is now used for fuel and in the making of gas. Natural gas also fell from \$392,823 to \$336,183. The decrease was partly due to the stoppage by the Ontario Government of the export from the Essex field to Detroit, which took place near the close of the year.

The making of cement is now assuming considerable proportions in the Province the out-put being 489,288 barrels as against 432,154 barrels in 1900. Some complaint is made of American competition and the out-put, though larger, was a little smaller in value, being estimated at 670,880 as against \$698,015.

Carbide of calcium was produced to the value of \$168,792 as compared with \$60,300 in 1900. Corundum worth \$53,115 and arsenic worth \$41,677 were also notable products.

The results of the year have been to demonstrate the importance and value of the mining industry in the Province, and were such as to lead to sanguine expectations for the future.

I am indebted to the courtesy of Mr. Gibson, the Director of Mines, for the following table showing the

MINERAL PRODUCTION OF ONTARIO FOR 1901.

PRODUCT.	1900.		1901.	
	Quantity.	Value. \$.	Quantity.	Value. \$.
Metallic :				
Copper..... lb.	6,728,000	319,681	9,074,000	627,080
Gold..... oz.	18,767	297,861	14,293	244,443
Iron Ore..... tons.	90,302	111,805	272,538	174,428
Nickel..... lb.	7,080,000	756,626	8,882,000	1,731,650
Pig Iron..... tons.	62,386	936,066	116,370	1,701,703
Silver..... oz.	160,612	96,367	151,400	84,830
Steel..... tons.	2,819	46,380	14,471	347,280
Zinc ore..... tons.	500	500	1,500	15,000
Total Metallic.....		\$2,565,286		\$4,926,379
Non-Metallic :				
Arsenic..... lbs.	606,000	22,725	1,389,056	41,677
Building Materials— (Brick, stone, lime, etc.) tons.		2,688,351		3,034,854
Carbide of Calcium..... tons.	1,005	60,300	2,771	168,792
Cement..... bbls.	432,154	698,015	489,288	670,880
Corundum..... lb.	120,000	6,000	1,068,000	53,115
Petroleum..... Imp. gals.	23,381,783	1,869,045	21,433,500	1,467,940
Natural Gas.....		392,823		336,183
Salt..... tons.	66,588	324,477	60,327	323,058
Other Products.....		671,602		689,292
Total Non-Metallic.....		6,733,338		6,785,791
Add Metallic.....		2,565,286		4,926,397
Total Production.....		\$9,298,624		11,712,188

QUEBEC.

The production of asbestos was the outstanding feature of the year in Quebec, the total value of the output being estimated to have been not much short of a million and a half dollars, the largest in the history of the industry. Three modern and splendidly equipped milling plants were installed at Thetford Mines, three at Black Lake, and one at Broughton. Seven companies operated all the year round and three others intermittently, occupying a force of about 1500 men. It is expected that with no change in the market twelve companies will be in operation in 1902 requiring a force of at least 2000 men. The other mineral products of the Province were iron ore, chromite, mica, felspar, copper pyrites, galena, burnt ochre, barytes, phosphate, and building material.

NEW BRUNSWICK.

Mining in New Brunswick was mainly confined to the production of copper, manganese, gypsum and building materials. A small quantity of coal was also won. At Dorchester the Intercolonial Copper Company mined 40,000 tons and have installed a first-class mining and treatment plant.

NOVA SCOTIA.

Mining progress in Nova Scotia was again chiefly remarkable for the continued and very gratifying expansion in the production of coal, coke, iron and steel. As already stated the total output of coal for the twelve months was in excess of 3,800,000 tons an increase of quite 500,000 tons over the production in 1900 and a result very largely, if not entirely, brought about by the operations of the Dominion Coal Company which raised 2,561,783 tons as compared with 1,999,737 tons in 1900. This company delivered 863,633 tons to St. Lawrence ports; it exported about 600,000 tons to the United States, principally for gas and coke-making; and the balance of its production practically went to the Sydney steel works.

The Dominion Iron and Steel Company has now its furnaces and converters running and this enterprise will very shortly be operating on a large scale, which means, unless some untoward change takes place in the trade that we are assured of a very material increase in our coal consumption during the present year. The output of the Province for the year was reduced by something like 70,000 tons of American coal purchased for the Intercolonial Railway.

The Nova Scotia Steel and Coal Co., have continued their regular operations at the Sydney Mines Pit, and have completed the construction of an up-to-date coking plant. They are engaged now in building a new shipping pier, and in opening the Lloyd's Cove seam.

In Inverness County considerable progress has been made in development. The Port Hood Colliery has been placed on a good footing for shipping coal. At Broad Cove, the development of that field has been steadily advanced in a substantial manner by the Inverness and Richmond Collieries and Railway Company.

American capital has taken hold of the Mabou district, and is preparing to win the submarine areas.

In Pictou County the only development of note has been the opening of one of the Marsh seams by the Nova Scotia Steel & Coal Co. It is stated that the coal from this opening is specially adapted for use in the converters of the Company, and that the entire output of the mine will be absorbed for this purpose.

In Cumberland County the development of the Springhill reserves of coal has been continued in a satisfactory manner, and the collieries have been overhauled and refitted in every respect. Much interest has been taken during the year in explorations in the other districts of the Province yielding indications of the presence of coal. The Provincial Government acquired some time ago five drills, two of these were of the "Calix" pattern, and have proved very successful. The other drills are the Bullock pattern, two being hand-drills, and the other a steam drill. These drills have been licensed to parties in various parts of the Province for prospecting for various minerals, and have proved highly successful. The results of explorations in the new coal fields appear, as far as carried out, to give proof of the presence of a number of seams of coal of good quality, and as a rule of about the thickness of the smaller seams worked in Cumberland County.

The following returns of the output of the various collieries during the twelve months have been compiled from figures furnished to me by the managers:—

COLLIERY RETURNS 1901.

Dominion Coal Co.....	\$2,561,783
Cumberland Railway and Coal Co.....	411,000
Acadia Coal Co.....	270,253
Nova Scotia Steel and Coal Co.....	237,184
Intercolonial Coal Co.....	204,402
Canada Coals and Railway Co.....	68,055
Gowrie and Blockhouse.....	20,700
Port Hood Coal Co.....	20,000
Cape Breton Coal Co.....	13,534
Inverness and Richmond.....	13,500
Sydney Coal Co.....	8,949
Other, estimated.....	5,000
	\$3,834,360

COKE MADE.

Dominion Iron and Steel Co.....	192,873	tons.
Acadia Coal Co.....	11,738	"
Intercolonial Coal.....	5,305½	"
People's Light and Heat Co.....	8,480	"
Nova Scotia Steel and Coal Co.....	23,540	"
Total.....	241,936	tons.

PIG IRON AND STEEL MADE.

Dominion Iron and Steel.....	pig iron	111,014	tons.
Nova Scotia Steel and Coal Co.....	"	26,793	"
do do.....	steel ingots	25,678	"

Gold Mining in Nova Scotia has practically remained stationary, the output being about 31,000 ozs.

The Richardson, Blue Nose, Brookfield, and most of the other regular producers report satisfactory yields. A number of new mines have been opened; but in a number of cases further work has shown that they cannot be depended on for permanent outputs.

The most encouraging feature of gold mining in the Province is the preparation being made to open the Dolliver Mountain district by a strong American syndicate. This lies on the same belt as the Richardson, and is believed to present even larger beds of medium grade ore. An up to date mining and milling plant is being installed by this company.

The gold and silver contents of the ores of the Cheticamp River in Inverness county have continued to attract the attention of the Cheticamp Mining Company, and it is reported that they are now able to effect a classification of the lead and zinc ores of that district, so as to put them in a marketable concentrated shape. The result of these operations will be watched with much attention for there are numerous indications in that district of the presence of mineral deposits of auriferous copper and lead ores.

The production of pig iron as stated was 137,807 tons. The only company carrying on iron ore mining operations was the Nova Scotia Steel and Coal Company, which mined about 18,000 tons at Bridgeville, Pictou County.

A little over 418,000 tons of Bell Island ore were imported for the furnaces at Sydney and at Ferrona. Ore was also imported from the United States, Spain and Cuba.

The explorations for iron ore were not marked with much spirit. A little work was done on the Whycocomagh deposits which resulted in tracing beds of ore still further north. The explorations completed at Nictaux in Annapolis County have shown clearly the enormous extent and great value of the iron ores of that district.

The remainder of the mineral production of Nova Scotia continued much as in previous years. The export of Gypsum was about 136,000 tons in addition to small quantities used locally for fertilising and architectural purposes.

The production of limestone was about 100,000 tons largely used for the furnaces at Sydney and Ferrona.

A few hundred tons each of Barytes and Infusorial earth were reported from various points.

The exploitation of the copper ores of Cumberland and Colchester Counties is being continued. At present a smelter is being erected near Wentworth with a capacity of 25 tons a day. At Cape D'Or, in Cumberland County, the Colonial Copper Company has done a lot of preliminary work on beds in the trap carrying metallic copper. It is stated that the indications are promising for a rich and extensive deposit.

The CHAIRMAN—I would call the attention of the members to the enormous amount of work entailed in getting these figures together by our Secretary (applause).

After some discussion by Messrs. Ingall, the Secretary, Chairman, and others, on the various methods adopted in Canada of computing values, and the necessity of adopting a greater uniformity in the dates of publication of statistics by the Provincial and Dominion Governments, the meeting adjourned at 5.30.

TUESDAY EVENING SESSION.

The members assembled at eight o'clock, Mr. Cornelius Shields, General Manager of the Dominion Coal Co., occupying the chair.

GOVERNMENT AID TO MINING.

Mr. C. SHIELDS, in taking the chair, expressed his pleasure at meeting the members of the Institute. It was a great honor to preside over such a distinguished gathering, particularly on the occasion of the discussion of such a question of so much moment as Government aid to Mining. The proposal to establish a Dominion Department of Mines, was a move in the right direction, one which had already been too long deferred.

Mr. J. E. HARDMAN then introduced the question in an excellent address, reproduced elsewhere in full in this issue. He dwelt upon the national importance of mining and of the urgent necessity of the establishment at Ottawa of a Department which would give special attention, not only to economic geology, but to the various phases of mining and metallurgical development which had of late years assumed a leading position in the industrial progress of the Dominion.

Dr. F. D. ADAMS—The question, "How may the government of a country promote the interests of mining and the development of its mineral resources?" is one which may find various answers according to the character of the country and the financial position of the government.

In every civilized country of the world at the present time there is a national geological survey, and the principal and avowed aim of these surveys is the development of the mineral resources of their respective countries. That is to say it is the universal opinion among the civilized peoples of the world that geological surveys are of practical benefit to them.

The law establishing the United States Survey provides that the Director shall have charge of the Mineral resources and products of the national domain." Now we in Canada are blessed with a very extensive national domain and comparatively limited financial resources, and the question which faces us is how can we best with the means at our disposal set about developing our mineral wealth.

I believe the most effectual way in which the government can do its share towards this development consists in increasing the efficiency of, and, if necessary, entirely remodelling an institution which we already have and which in times past has done good work for the Dominion. I refer to our Geological Survey, and would like to point out certain ways in which the efficiency of this valuable institution could be increased and the services which it renders to the country be made of more direct practical value.

The first and chief aim of all national geological surveys is the preparation of a good geological map of the country. On this is shown the distribution of the various rocks which form the earth's crust in these countries, and the position and distribution of all known mineral deposits. These maps also show the connection of the mineral deposits in question with certain geological formations, and hence, the distribution of the formations in question being shown, the areas in which additional occurrences are to be sought. This aeral mapping has been carried on for years by the Geological Survey of Canada and a considerable part of the more settled portion of the Dominion has been mapped. The value of many of these maps has been very widely recognized. I might cite as samples: Lawson's Geological Maps of the Lake of the Woods and the Rainy River District, which were of immense value in the development of that region; the maps by Dr. Geo. M. Dawson, of various portions of British Columbia, and Mr. Fletcher's maps in Nova Scotia.

This work should be continued until we have a good geological map of all those portions of the Dominion which are worth surveying geologically.

I believe, however, that this work, which occupies the greater portion of the

staff of the Geological Survey of Canada, might be carried out in a much more efficient manner than it is at present. We have to remember in the first place that in Canada there are no topographical maps. The township maps, issued by the Crown Lands Departments of the various Provinces, consist of a series of lot and range lines with a few lakes and streams indicated where they cross, or sometimes where they do not cross, the lines in question. They are innocent of all delineation of roads, hills, etc., not to mention contour lines. Some of these maps are tolerably accurate so far as they go, while others are intolerably inaccurate. When an attempt is made to put a series of these township maps together they cannot be made to fit. Like the Gentiles, each is a law unto himself. Further trials also await the man who, having compressed a series of these maps into compact form, endeavors to hang them unto the proper projection. He will find that this is, in almost every case, impossible. In the case of a map which Dr. Barlow and I recently made for the Geological Survey of Canada, of a large district in Central Ontario, it was found impossible to ascertain within four miles the position of one of the principal villages in the area, and special lines of transit survey had to be made from the Georgian Bay to Kingston to determine the precise location of this and other points upon the projection.

Now, in order to show the geological structure of any district, a good topographical map is absolutely necessary, and the geologist, with us, has to make it for himself. When, therefore, he undertakes the geological survey of any district he is obliged to spend, let me say three-quarters of his time in doing topographical work and one-quarter of his time in geological investigation. This is manifestly a great waste of time and money, for the geologist, who commands a higher salary than the topographer, spends most of his time doing topographical work which generally he cannot do as well as a specially trained topographer, while in some cases a man who is really a topographer is selected to make the survey and his geological work is accordingly of very indifferent quality. The general rule that a man cannot do two things well at the same time governs here, although for years the Canadian Survey have been endeavoring to show that it does not hold. In their case we may safely say that the exception proves the rule.

When we turn to the geological surveys of other countries we find that they employ a separate and distinct class of skilled topographers, who go into the area first and make a topographical map which is then handed to the geologist who uses it as the basis for his work. In order to make the Canadian Survey more efficient this plan should be adopted. The regular field staff should consist of two sections:—(1) topographers, and (2) geologists. The former class should be the more numerous and would not command such high salaries as the geologists. Each class would thus be enabled to do its work thoroughly and well and I venture to say that under this arrangement the geologists would accomplish much more work than they can do at present, and the geological maps *could be prepared and published more rapidly*, thus avoiding the delay in issuing maps of important areas, which is in many cases at present unavoidable. Under this plan of working moreover we would have in the case of every area surveyed, not only a good geological map but a good topographical map, which would have a value of its own for many diverse purposes.

The "folio" exhibited shows how the work of the United States Geological Survey is carried on in this direction. The country is divided up into quadrangles, which vary somewhat in size according to the circumstances of the case; and the survey of these quadrangles is taken up in the order of their relative economic importance. When the survey is completed the information which has been collected is presented in four maps, as follows:—

1. The topographical map of the area, which is uncoloured.
2. The geological map.
3. A second geological map, giving special prominence to all occurrences of deposits of special economic value.
4. A map with geological sections crossing it in certain lines which bring out clearly the geological structure of the area in question.

These maps are accompanied by a short explanatory text. These "folios" form part of the great geological and topographical map of the United States now in course of construction. Some fifty of them have been already published and they now appear at the rate of about ten per annum. I was informed recently by the Director of the United States Geological Survey that there was not a single important mining area in the United States from which he had not had applications asking that the necessary surveys be made and one or more of these folios issued for the districts in question.

Now, while in Canada we cannot undertake to do work so rapidly as this and while this precise form of publication is probably not the most suitable for us, we can certainly obtain many hints from these folios of the United States Geological Survey which will enable us to improve our Canadian maps.

There is another class of work which should be undertaken by the Canadian Geological Survey, and which would be of the greatest practical value to the country. This is "Mining Geology," and consists in the preparation of detailed reports or monographs on certain limited areas where mineral deposits of great economic value are

known to exist. These reports should be accompanied by geological maps on a large scale, and should embody the results of as complete a study of the area as is possible, in which all resources of modern knowledge are brought to bear upon the problems presented, and comparisons drawn with foreign areas of similar character, from the development and working of which much valuable information bearing on the areas surveyed could often be obtained. The reports should be clearly written, in language "understood of the people," so that they would be of direct practical value to all interested, either in the area in question or in mineral deposits having the character of those described. Prompt publication of such economic work is specially imperative, for its value as an aid to development decreases with every day and almost every moment of delay. As districts worthy of such study one might mention, among many others, the Copper-Nickel district of Sudbury, the Chromic Iron Ore district of the Eastern Townships, and the Iron Ore regions of certain portions of Ontario. How many camps in British Columbia would, during the past two or three years, have profited by such special study, and how many would even now profit by it?

For this work I believe geologists of special fitness and training should be selected, who might or might not be permanently connected with the Staff of the Survey. With proper assistance from the Topographical Staff and the Chemical Department, the work should go rapidly forward. It might frequently be found advantageous to secure the services of outside geologists or mining engineers, especially competent to report upon certain classes of mineral deposits, e.g., coal, manganese, graphite. For special pieces of work the men on the Survey staff engaged in this work should form a distinct class of Mining Geologists and especial prominence should be given to their work.

The addition of these Mining Geologists to the staff and the vigorous prosecution of this class of work by the survey is the chief innovation needed to make the work of this Department tell, as it should, in the development of our mineral resources. In connection with this class of work, the Survey could with great advantage arrange to co-operate with the Universities and so make use of the unusual facilities offered in the ore dressing and metallurgical laboratories of the Canadian Mining schools for the purpose of making concentration and other tests such as are now being regularly carried out in these laboratories, on ores, etc., from various portions of the Dominion.

Concerning the duties of the Survey in preparing annual mineral statistics, I will say nothing, not because this matter is not of importance, but because it has already been so well emphasized by Mr. Hardman. The Statistical Department should, however, extend its work and make itself of still further value to the country by publishing, at frequent intervals, bulletins on the Mineral Resources of Canada—as, for instance, one on the Iron Ores of Canada; others on Canadian Coal Fields; Canadian Asbestos Deposits; Canadian Clays, Building Stones, etc.—in which the information scattered through the various reports and thus not available as a whole to inquirers, would be gathered together, brought up to date, and published in convenient form. This Department should in fact undertake all the functions of a Bureau of Mines and Mineral Resources. For the satisfactory and economic working of the Survey, furthermore, the Chemical Department should be entirely reorganized.

The staff of the Survey would thus consist of the following classes of officers: (1) Mining Geologists; (2) Field Geologists; (3) Topographers; (4) Chemists and Assayers; (5) The offices of the Bureau of Mines and Mineral Resources. There would also be the Petrographer, the Palæontologists, the Accountants, the Museum staff, etc.

I believe, then, that the Government has in the Geological Survey the nucleus of a department which might render the most important and valuable assistance to the mineral history of the whole Dominion. The Survey however, needs to be *reorganized and extended*, and converted into a "Department of Mines and Geological Survey." (Applause.)

In my humble opinion, moreover, the establishment of a Department of Mines separate from the Geological Survey would be unwise. The aims, and to a great extent, the work of both departments would be identical. The work above outlined could be carried on by a single bureau far more satisfactorily, for no line of division between the two could be drawn. Neither a Geological Survey nor a Department of Mines could by itself attain its full measure of usefulness, and if two separate Departments were created there would be a continual overlapping of work, which would lead not only to confusion but to waste of time and effort, and loss of efficiency. Lack of proper co-ordination in the various classes of work, which is one of the weak points of the Geological Survey at present, could be entirely prevented by making one strong, well-organized department, which would undertake all the various sorts of work that the Government should be called upon to do in the interests of our mining industries. (Applause.)

Mr. W. BLAKEMORE—It is not my intention to take up much of your time, but I desire to follow up what has been so ably said by the previous speakers with a resolution to the following effect: "That the Canadian Mining Institute, in annual

session assembled, desires to direct the attention of the Federal Government to the magnitude and importance of our mining industry, which during recent years has developed so rapidly, and respectfully urges the increase of Government aid wherever possible, and the establishment of a strong and practical Department of Mines, believing that nothing will do more to develop the natural resources and promote the general prosperity of Canada." Now, I question that any gentleman who does not attend our meetings knows the magnitude of our mining industry—We have heard from the report of the Secretary, that the mineral production reached seventy millions of dollars. Now just for a moment let me call your attention to this fact, that only 20 years ago the total mineral production was not a great deal more than the single item of copper or nickel, and that will show you with what leaps and bounds it has gone forward. Let me make this suggestion, there is no impropriety in our endeavouring to impress the Government with the magnitude of the industry we represent and asking them to do more than they have ever done before on that account. (Applause.)

Mr. B. T. A. BELL—Before the motion is put to the meeting perhaps I may be permitted, as one who has been actively associated with the mining industries of this country for a period of some seventeen years, to emphasise the necessity of the establishment of a Department of Mines entirely separate and distinct, if need be, from the present Geological Survey, a Department whose chief aim shall be to give to the public more complete and more frequently published statistics of our mineral production, accurate and up-to-date monographs of mining districts and mining industries and information of a more commercial character than we have hitherto been able to obtain either from the Federal or Provincial Governments. The remarkable expansion of mining as an industry in Canada and its immense importance to the trade and commerce of the Dominion are not fully realized by the people of this country. It is significant that out of our mineral production last year, amounting to over seventy millions of dollars, the great bulk of our output was exported. My own idea is that greater prominence must be given to the commercial and business aspect of our mining industries, that one of the chief aims of a well equipped and capably administered Department of Mines would be to collect and furnish, not merely periodically in its reports, but on demand, the latest available data concerning the development and progress of our mining industries. Business men, capitalists enquiring into industries for the purpose of investment, require official data of a business character and the Government should be able to supply them with it. More attention should be given to such questions as the capital invested in our mines, the dividends paid, cost of extraction and treatment, labor, machinery equipment, mining and metallurgical practice, markets, freights, and the numerous other questions of a commercial nature which people desirous of placing money in an industry naturally desire to obtain from an official source. By combining the technical with the industrial and commercial, by employing a competent staff of economic geologists and topographers, together with a corps of first-class mining engineers a Department of Mines will do much to advance the development of the great mineral resources of the country. (Applause.)

Dr. ROBERT BELL—I would like to say a few words not only upon the Geological Survey but upon the remarks of the gentlemen who have preceded me. There seems to be an impression that we are not practical. The Geological Survey was instituted to do practical work and it has done so since the moment I have been connected with it. I began a little more than a boy and I have travelled and worked from Nova Scotia to the McKenzie River, from the Rockies of British Columbia to Baffin's Bay, until I have come to be regarded as a sort of living index to the younger fellows of the work of the Survey. Sir William Logan was a practical man and did practical work and we have endeavored to do that ever since. I am glad that some suggestions have been made wherein the work of the Survey might be improved. I have always said that more should be done in the direction of economic geology and we have tried to do so far as we could. Dr. Adams has pointed out the importance of topographical work preceding the Geological Survey; that is all very well if the Government would undertake it. We are obliged to do topographical work simultaneously with the geological work. Dr. Bell then referred to the work done by McConnell in the Yukon, by Gwillim in Atlin, by Brock in the Boundary, by McEvoy, in the Crow's Nest Pass, by Low, and other members of the staff. I don't want anything more practical than the work of these men. We want science first and business after. I had almost forgotten about the chemical branch; we have good chemists and they are very hard working men. Dr. Hoffman goes back to his laboratory every night and his heart is in his work. I think our chemical work is done well. Altogether we are doing, I think, excellent work on behalf of the country.

Mr. B. T. A. BELL—Just a remark—The object of this discussion is not to criticize the Geological Survey, for we all recognize the value and importance of that excellent institution. We do, however, urge upon the Government the necessity of a Department of Mines which will give to the public more information of practical utility to business and mining men than hitherto has been available from any Government source.

Mr. BLAKEMORE—When I made use of the words practical men I did not as

Dr. Bell has done refer to him as a California saloon keeper. I think that in any mining department whether attached to the Geological Survey or not there should be attached permanently or in an advisory capacity a first-class mining engineer with a practical experience in mining.

Mr. EUGENE COSTE—I think it was in 1884, if I remember correctly, that a Parliamentary Committee investigated this question and made a report to the Government the outcome being the establishment of the present Mines Branch of the Geological Survey to which Mr. Ingall and myself were appointed. It has been said here to-night that it has not been the fault of the Geological Survey if foolish investments in mines have been made. I differ somewhat from this view. Of course there will always be foolish speculations in mines, as in other matters, but if at that time the Geological Survey had done what the Parliamentary Committee of the House of Commons had recommended it to do and Mr. Ingall and myself had been given a free hand to carry out and develop the work of that Mines Branch I am not so sure but that many of the foolish investments might have been prevented. Although appointed mining engineer in charge of the Branch I was not given a free hand and finding it impossible to carry out the work as I conceived it ought to have been done, I sent in my resignation. There is no question now that a properly equipped mining Department should be organized with a competent staff of mining engineers, economic geologists, topographers and assayers. So far the Federal Government has not appreciated the magnitude and importance of the mining industries of the Dominion. They have, until recently taken no steps to inform themselves upon their necessities and requirements. Had there been a properly constituted Mining Department at Ottawa I venture to say there would have been no such bungling in the mining regulations adopted for the Yukon. When that great gold field was discovered they were taken by surprise, they had no one to advise them, regulations were made and changed every week and for that matter are being changed yet, creating no end of dissatisfaction in that country. Now if the Government had had in its service a first-class mining engineer to advise them questions of this character would be greatly simplified. There is no doubt the Government should pay more attention to the mining industries and organize a proper Mining Department, either in connection with the Geological Survey or out of it, but it must be organized and established on a thorough business basis. (Applause.)

Dr. EUGENE HAANEL—I came here rather to listen than to speak, nevertheless, I have been very deeply interested in the papers that have been presented,—ably and well done. The one point that has presented itself to me from the discussion is that a Department of Mines is an absolute necessity for the mineral development of Canada and I am exceedingly sorry that Mr. Sifton could not be with us to hear what you have said, but he was ordered to go South. I think my report to him will encourage him on this subject and greatly strengthen his hands.

Mr. J. C. DREWRY—I am not a member of the Geological Survey nor a Mining Engineer, nor a practical man from California, but as one trying to make an honest dollar in mining out there in British Columbia. I am very glad to be here. We all acknowledge that the work of the Geological Survey is good but it could be made better and more practical—that is the word to use—and I hope that Mr. Sifton will go on and establish a Department of Mines—swallow up the Geological Survey if necessary—but at all events go ahead and give us an institution that will be practical and useful.

Mr. B. T. A. BELL—Would it not be well to adjourn this discussion until tomorrow afternoon?

Mr. EUGENE COSTE—Can't we get through to-night?

Mr. HARDMAN—As the seconder of the resolution I would say that we expect other members from a distance to-morrow and it might be well to give them an opportunity of discussing the resolution.

Dr. J. B. PORTER—Mr. Drewry has just suggested that the Department of Mines might possibly swallow up the Geological Survey and Dr. Adams has suggested that we should dwell at more length upon the extreme importance of the Department of Mines being subordinate to the Geological Survey. Now it seems to me that this is immaterial but it is essential I think that both should be operated under one head. Let us not double the Bureaus but rather have one do the whole thing.

Mr. B. T. A. BELL—I would suggest that the resolution be remitted to a Committee consisting of Messrs. Shields, Hardman, Coste, Dr. Bell, Dr. Goodwin, Blake-more, Dr. Adams and Professor Miller, and that their report be presented at to-morrow afternoon session.

Mr. JAMES MCEVOY—While the Geological Survey is doing good work still there is room for improvement and we might suggest improvement along the lines of the United States Geological Survey.

Mr. C. SHIELDS—It seems to me that the action of the Meeting should be clearly set forth in one resolution and it is possible that the one we have before us might be improved—might be made much stronger.

Mr. B. T. A. BELL—Then moved the appointment of the Committee. Carried. The meeting adjourned at 10.30 p.m.

WEDNESDAY AFTERNOON.

The members reassembled at three o'clock, Mr. John E. Hardman, S.B., M.A.E., presiding.

CIVIL ENGINEERS' BILLS.

The CHAIRMAN—The Committee appointed to examine and report upon the Canadian Society of Civil Engineers Bills present the following resolution:—

Resolved that the Canadian Mining Institute having examined and considered the Civil Engineers Bill now before the Ontario and Manitoba Legislatures is of the opinion that this Act should not be passed since it gives powers to the Canadian Society of Civil Engineers which should not be given to any one branch or section in the present condition of the engineering profession. Such powers should be retained by the Government itself or reserved for a society or association representative of the whole profession.

The Committee also suggests that action relative to the proposed Bill in B.C. be placed in the hands of the Secretary with power to act in the premises.

(Signed) JOHN E. HARDMAN.
DR. W. L. GOODWIN.
WM. BLAKEMORE.
E. COSTE.

The resolution was then put to the Meeting and adopted.

NATIONAL IMPORTANCE OF MINING.

The CHAIRMAN—On behalf of the Committee to which last evening you remitted Mr. Blakemore's resolution, I have to report that we have been in session all morning but have been divided upon two resolutions, the one by Mr. Blakemore and an amendment to it proposed by Mr. Coste adding the words "and which shall include the present Geological Survey and all necessary branches".

Mr. Coste seconded by Dr. Adams moved the adoption of the amendment.

Mr. Blakemore, seconded by Mr. J. C. Drewry moved for the adoption of the original motion.

Mr. Jas. McEVOY—We should have more in these resolutions. The Geological Survey should be reorganized and it would be advisable, it seems to me, to clearly specify to the Government the lines upon which this reorganization could be made effective.

Mr. EUGENE COSTE—In support of my amendment I would only say that we must recognize existing conditions and I feel that we should not be too radical in our recommendations. The Geological Survey already exists and any new Department of Mines should, in my opinion, include the Survey.

Mr. INGALL—As a Government officer do you understand either resolution to mean the abolition of the Survey?

The CHAIRMAN—The resolution as I understand it does not interfere with the Geological Survey at all. The motion brought up last night is one for a recommendation to the Government for an entirely different department devoted to mining alone. Therefore, answering Mr. Ingall's question, I can't see for my own part why the Survey has anything to say or is in any way connected with this resolution asking for a Mines Department.

Mr. BLAKEMORE—Replying to Mr. McEvoiy I do not think it would be wise at this stage to introduce any details into the resolution.

Dr. W. L. GOODWIN—The difficulty I find with Mr. Blakemore's resolution is that it recommends the establishment of a Department—a new Department of Government.

Mr. B. T. A. BELL—That is just what it means and that is just what we want.

Dr. GOODWIN—Just so; but the Government may not regard so large a scheme as practicable from their point of view. On the other hand Mr. Coste's resolution leaves to the Government the establishment of a Bureau devoted to mining and the other branches that would be necessary, in such a way that would conveniently fit in with existing conditions. I think the Survey should be mentioned in our resolution because it would be unwise to disconnect the work that the Geological Survey is doing which is the scientific basis of mining. I would suggest a Department of Mines and Geology, which would represent all branches coming within the purposes and powers as employees of the Government.

Mr. GEORGE CAMPBELL—I, for one, do not believe in half measures. We have Departments of Marine and Fisheries, of Agriculture and of Labor, why not have a Department of Mines?

Dr. ADAMS—The basis of a Department of Mines should be the Geological Survey. If Mr. Blakemore's resolution goes before the Government they will say the Mining Institute does not consider the Geological Survey to be of any value to the country and to the Department of Mines. Now we do consider the Survey to be of value to the country and to the Department of Mines. A former speaker has compared the Departments of Mines with that of Agriculture and Fisheries but the analogy is not quite appropriate. Mineral lands are owned by the Provinces—the Federal Government has no control of mines in the Dominion.

Mr. B. T. A. BELL—Yes they have—What about the Yukon and the Territories?

Dr. ADAMS—When these Territories become Provinces, as they will ultimately, the mining lands will pass from the Dominion into their control, as at present in the older provinces.

Mr. B. T. A. BELL—I see we have with us to-day our old friend Captain Adams one of the pioneers who, eleven years ago, promoted the organization of the Quebec Mining Association out of which our present Institute has evolved. I am sure I voice the sentiment of everyone present when we welcome Captain Adams back again to our meetings. Perhaps he has something to communicate to the discussion!

Captain R. C. ADAMS—I am very much surprised at the kind illusion made to me in asking me to address the meeting. I regret to say that I am not in very good health and am not prepared to make a speech. I am, however, heartily in favor of a Government Department or Bureau which will classify and concentrate the information concerning mines collected by the Provinces.

The CHAIRMAN having called upon Mr. T. W. Gibson, Director of Mines for Ontario.

Mr. T. W. GIBSON—Not having been present last evening I am not acquainted with the lines of the discussion but from what I have gathered from the remarks of the speakers this afternoon it seems to be merely a difference of opinion as to details. Whether the establishment of a Department of Mines with a responsible Minister, or a sub-department which should include everything connected with the mining industry—which of these methods will be the better is not easy to decide—but I would like to bring this point before the meeting that in working out a scheme the Government must take into consideration what is being done by the Provincial Governments. The mining lands in all the older Provinces are the property of the Provincial Governments and the laws governing them are made by the Provincial Legislatures. Hence in a scheme of this kind, while I am not at all desirous of opposing anything that the Institute may suggest, care will have to be taken that the work of any new Department or Bureau does not conflict with the operations of the Provincial Governments. It will interest the members to know that the output from our mines in Ontario last year has grown to a value of twelve millions of dollars as compared with nine millions of dollars in the year 1900. (Applause).

Mr. JAMES McEVOY—I think we might overcome the difficulty by using the words "A Geological" instead of "The Geological Survey". (Laughter).

Captain ADAMS—I would ask Mr. Bell what a Department of Mines will do more than the Geological Survey does now?

Mr. B. T. A. BELL—I am afraid Captain it would take me three or four full sessions of the Institute to do that satisfactorily. (Laughter).

Prof. T. L. WALKER—I think I am right in maintaining that geology is a wider subject than mining. If the Geological Survey is to fall from its present position to that of a subordinate branch of a Department of Mines that would be a step backward.

Dr. ROBERT BELL—There is a great deal of force in what Professor Walker has said and all I can say is if you can't do us any good don't do us any harm.

Mr. B. T. A. BELL—I would call the attention of the Chair to the irrelevancy of this discussion. We are discussing the question of a Department of Mines with which, at this stage, in my humble judgment, the Geological Survey as an institution has nothing whatever to do.

The CHAIRMAN—I am anxious to confine the discussion to the question. We are not discussing the Geological Survey we are simply asking for greater recognition of the mining industry. The relation of the Geological Survey to a Department of Mines is a matter of expediency which may very well be left in the hands of the Minister of Interior and the Government. We say to them—these are our views give the mining industry a show.

Mr. EUGENE COSTE—We have discussed this matter for sometime now and I am emphatically in favor of embodying in the resolution the reference to the Geological Survey. In doing so we do not say that we want the Survey to occupy an inferior position. The words have been put there to show the Government that it is necessary to have not only a Geological Survey but a topographical and all the other branches in order to make a Department of Mines complete and efficient. Why not say it in plain words? I think it will help matters.

Dr. ROBERT BELL—This is a very important matter. I agree with what Mr. Coste has said. He has been a member of the Geological Survey staff and appreciates us but I think in the way he puts it he does not appreciate us. In the United States the Geological Survey is supreme and most comprehensive and includes a Division of Mines and Mineral Statistics.

Mr. BLAKEMORE—Having withdrawn his resolution the Chairman put the amendment, moved by Mr. Coste seconded by Mr. Blakemore as follows:

Resolved that the Canadian Mining Institute in Annual Session assembled desires to direct the attention of the Federal Government to the magnitude and importance of our mining industry which during recent years has developed so rapidly and respectfully urges an increase of Government aid

wherever possible and the establishment of a strong and practical department of mines or of a department which shall be devoted to the interests of the mining and metallurgical industries and which shall include the geological Survey and all other necessary branches.

The motion was carried by a large majority.

NOTES ON GOLD MILLING AT REPUBLIC WASHINGTON.

Mr. FRITZ CIRKEL presented an exceedingly interesting paper. He described the ores of the Republic District in Washington and their peculiarities. He then referred to the various systems of treatment which had been tried, closing with a description of the large mill erected by the Republic Mining Company upon the designs of Mr. Jackling.

WEDNESDAY EVENING.

The members reassembled at 8 o'clock in the Ladies Ordinary there being a very large attendance.

Prof. W. G. MILLER opened the session with a paper describing the "Varied Mineral Resources of Eastern Ontario". He referred to the iron mines, the newly-opened corundum mines and other resources of the country. This paper—of which we hope to represent an abstract later—was illustrated by a number of maps and photographs presented by means of lantern slides. In conclusion Prof. Miller said that Ontario was producing as great a variety of mineral substances as any part of the world of equal area, while as a whole Canada had a record as a mineral producing country of which she might justly be proud.

ILLUSTRATED ADDRESS ON THE YUKON.

After the conclusion of Prof. Miller's paper, Mr. F. B. Wade, of Dawson, addressed the Institute, by invitation, on mining in the Yukon. Mr. Wade was one of the pioneers in the first great rush to the Klondike, and was for three years chief law officer of the Dominion in that territory. In his address he adopted the method of contrasts, showing both verbally in his address, and by a large number of fine lantern slides, the different state of affairs in the North four years ago and to-day. The Chilkoot Pass in the first rush and the passenger train on the Yukon and White Pass Railroad—the roughly built barge of the prospector and the Yukon River steamer—the Dawson tents and the brick-built city of to-day—with numerous similar contrasts of to-day, all effectively brought out by the photographs.

Unfortunately, however, Mr. Wade added, the Yukon had had the same experience as all the other mining camps in Canada, that at the outset, at any rate, it had to a certain extent failed to attract Canadian immigration. This, however, was commencing to correct itself, and he believed that the Census would show that, though somewhat tardy, the Canadian was commencing to take an interest in the country and to share in the patrimony to which he was entitled. He spoke of the great gold output of the Klondike, and of the rapid growth of Dawson, which, four years ago, was only a place of a few tents, and to-day showed an assessment of \$12,000,000. It was sincerely to be hoped that the time was not far off when Canadians would wake up to the fact that the Klondike was growing, and that the young man who went out today into the world to fight his way was in a very different position from the young man of a few years ago.

To one point especially the speaker referred with justifiable pride, and that was the excellent order preserved in the region and the absence of violence and lawlessness, which have been only too prevalent at Nome and in other mining districts which might be mentioned. This was largely due to the admirable organization and handling of the Northwest Mounted Police, a force of which Canada has just reason to be proud.

Mr. Wade expressed, in conclusion, his belief that the next excitement in the Yukon will be in quartz mining. Already there are many quartz locations, and two stamp mills are in operation on custom work, chiefly on test runs. The general opinion in the district is that the gold in the creeks has not been carried far, but has been very probably derived from the quartz ledges crossed by the streams, which are visible in many places in the form of narrow stringers. There are, he believes, many indications that intelligent prospecting will show substantial grounds for this opinion, and that quartz mining and milling will be prominent in future operations. At any rate, the gold industry of the Yukon promises to take on a permanent form, and to be an important factor in the mining industry of Canada for a long time to come.

At the conclusion of Mr. Wade's address a vote of thanks was unanimously passed, and the Institute adjourned until the next day.

The meeting adjourned at 11 o'clock.

THURSDAY MORNING SESSION.

The session opened at eleven o'clock in the Library, Mr. Hardman in the Chair.

OFFICERS AND COUNCIL FOR 1902.

The Scrutineers, who had previously examined the ballots, reported the election of the following Officers and Council for the ensuing year:—

PRESIDENT.

Mr. Charles Fergie, Intercolonial Coal Co., Westville, N.S.

VICE-PRESIDENTS.

Dr. Frank D. Adams, McGill University, Montreal.

Mr. Robert R. Hedley, Hall Mining and Smelting Co. Nelson.

Mr. Eugene Coste, M.E., Prov. Nat. Gas and Fuel Co., Toronto, Ont.

Mr. Graham Fraser, Nova Scotia Steel and Coal Co., New Glasgow, N.S.

COUNCIL.

Mr. John B. Hobson, M.E., Con. Cariboo Hydraulic M. Co., Bullion, B.C.

Mr. Frank Robbins, M.E., North Star Mining Co., Nelson, B.C.

Mr. W. F. Little, H. W. McNeill Co. Ltd., Anthracite.

Mr. Frederick Keffer, M.E., B.C. Copper Co., Anaconda.

Mr. Cornelius Shields, Dominion Coal Co. Sydney, B.C.

Mr. R. E. Chambers, M.E., Bell Island, Newfoundland.

Mr. W. L. Libbey, N. Brookfield, N.S.

Mr. D. W. Robb, Robb Engineering Co., Amherst, N.S.

Mr. A. P. Turner, Canadian Copper Co., Sudbury, Ont.

Mr. P. Kirkegaard, Canadian Gold Fields Ltd., Deloro.

Mr. E. A. Sjostedt, Lake Superior Power Co., Sault Ste. Marie, Ont.

Professor Courtenay DeKalb, Boston, Mass.

Mr. J. T. McCall, Canada Iron Furnace Co., Montreal.

Mr. B. Bennett, King Bros., Thetford Mines, Que.

Dr. J. Bonsall Porter, McGill University, Montreal.

Mr. George R. Smith, M.L.A., Bell's Asbestos Co., Thetford Mines, Que.

TREASURER.

Mr. J. Stevenson Brown, Montreal.

SECRETARY.

Mr. B. T. A. Bell, Editor *Canadian Mining Review*, Ottawa.

LOCAL BRANCHES OF THE INSTITUTE.

Mr. B. T. A. BELL suggested a resolution in favor of organizing local sections of the Institute in the various mining centres of the Dominion. He explained that if his plan was adopted the sections would be organized under the charter and by-laws of the Institute; their members would be members of the Institute; and papers presented at the meetings would be regarded as Institute papers and find full record in the volumes of the proceedings. He further explained that the object of this plan was to interest many who were unable to attend the Annual Meetings owing to the long distances to be travelled. Moreover, the local sections would be able to hold more frequent meetings, at such intervals as they might decide for themselves and thus create and maintain an interest which would be of value to the Institute generally and also to local mining.

The recommendation was generally approved and the following resolution presented by Dr. W. L. Goodwin was unanimously adopted:—

"That in view of the great extent of the Dominion and the long distances to be travelled by many members in order to attend the meetings of the Institute, it is expedient to organize local sections in mining towns and camps and other centers, and the Council is hereby empowered to take such action as is necessary to carry out this recommendation."

THURSDAY AFTERNOON.

The Meeting was called to order at 3.30 p.m. Papers illustrated by lantern projections were presented as follows:—

On the Iron Ores of Hudson Bay.

By Prof. G. R. Mickle, Toronto.

On the Iron Ores of Kitchener, B.C.

By Wm. Blakemore, Fernie, B.C.

On Gold Dredging.

By Dr. J. Bonsall Porter, Montreal.

On the Electro-Metallurgy of Copper Nickel Ores.

By Wm. Koehler, Cleveland, Ohio.

These papers and the discussion upon them occupied the whole of the afternoon.

ANNUAL DINNER.

At eight o'clock eighty members and their guests sat down to an excellent menu provided by the Windsor Hotel. A capital instrumental and vocal programme was presented, the intervals being interspersed with very brief speeches in response to a limited number of toasts. A thoroughly enjoyable gathering broke up about twelve o'clock.

FRIDAY MORNING.

A brief business session was held in the Library of the Institute on Friday morning. On motion it was decided to award a gold medal to be known as the Institute's Gold Medal for the best paper contributed to the proceedings of the Institute during the year. A deputation comprising Messrs. Hardman, Brown, Bell, Adams, Coste, Kirkgaard, Dr. Goodwin, and others was appointed to present to the Government the resolution respecting the organization of a Department of Mines.

The proceedings terminated with votes of thanks to the Chairman and to the Treasurer and Secretary.

NEW COMPANIES.

ONTARIO.

New York and Ontario Gold Mining Co., Limited.—Incorporated 28th February, 1902. Authorized Capital, \$1,000,000; in shares of \$10.00 each. Head Office:—Kingston, Ont.

English River Gold Mining Co., Limited.—Incorporated 28th Feb., 1902. Authorized Capital, \$1,000,000; in shares of \$1.00 each. Head Office:—St. Catharines, Ont.

COMPANY NOTES.

Le Roi.—Returns for February:—"18,794 tons of ore were shipped to the Northport smelter, containing 6,111 ozs. of gold, 12,461 ozs. silver, and 300 tons copper. Gross value (reckoning copper at 16 cents per lb., as in former monthly returns), \$225,696; average value, \$12.00 per ton. Taking yesterday's New York quotation for copper, namely, 12 5-16 cents per lb., reduces the averages value to \$10.83 per ton."

Ymir.—Cablegrams.—"For the second half of last month, level No. 10, 50 feet; main shaft, 19 feet." Office note.—"This makes the total length of the tunnel at this date 2,084 feet, and the depth of the shaft 713 feet."—Later advice: "Have commenced to operate cyanide process."

Le Roi No. 2—The manager cables:—"Rosslund, 5th March—Shipments last month amounted to 3,630 tons, containing 2,042 ozs. of gold, 4,885 ozs. of silver, 94 tons of copper. Estimated net profit, after deducting all smelting and mining charges, \$22,800." (Office note.—"The decrease in the amount of tonnage shipped is due, in the first place, to February being a short month; and, secondly, to the fact that the power plant was shut down for five days for repairs.")

Velvet Rosslund Mine.—Cable received 28th February gives the following first returns from smelters:—"69 tons yielded 69 ozs. gold, 75 ozs. silver, 8,472 lbs. copper, wet assay. Gross value, \$2,442, or an average of \$35.39 (£7 1s. 6d.) per ton. Net proceeds, \$1,500.23, or an average of \$21.74 (£4 7s.) per ton, after deducting smelters' charges. Crosscut to the west at 500 feet level is now in 64 feet."

Bosun Mines.—Telegram from the manager reports 160 tons galena and 100 tons zinc shipped during the month of February. Smelter returns for 160 tons, \$5,344.

The Whitewater Mines.—The following cablegram has been received from the company's representative at Nelson, British Columbia:—"During last month 5,700 tons have been milled, producing 474 tons of concentrates. Approximate profit on month's working is \$210 (£43)."

Arctic Slope Hydraulic.—At a meeting held on 10th December last, the following were elected directors for the present year:—Hon. F. Peters, Hon. Senator Reid, Quesnel, Capt. William Grant, William Munsie, A. Stuart Robertson, C. T. Penwill and F. W. Vincent. The directors afterwards met and elected Hon. F. Peters, President, Capt. Grant, Vice President, and Donald Fraser, Secretary. The new Board of Directors have made an entire change of management, and appointed Mr. J. H. Munroe, hydraulic superintendent for this season. Mr. Munroe has had considerable experience as a hydraulic miner, and started for the company's mines in Omenica on the 20th ultimo. Last year a considerable quantity of gold was recovered, but very much larger results are expected this season.

CONSOLIDATED CARIBOO HYDRAULIC.

The following is excerpted from the report of Mr. J. B. Hobson at a meeting of the shareholders held in Toronto on 23rd January last:—

The mine was operated only 104 days 1½ hours, with a quantity of water varying from 2,000 to 2,750 miner's inches, being 67 days 12 hours less than the season of 1900, when the water supply was sufficient to keep the mine in operation for a period of 171 days, 13½ hours.

The shortness of the water supply was caused by the unusually light winter snowfall and the hot, dry weather that prevailed during the spring and summer months. The season's mining operations were divided into two runs, as follows:—

Washing was commenced on the Upper Bench in Pit No. 1 on the 20th day of April, and was continued for a period of 88 days and 20 hours, ending on the 31st day of July. During the progress of the run 217,677 miner's inches of water were used to wash out 2,202,126 cubic yards of top clay, gravel and sliderock from the main bank and rims of the channel deposits, from which was recovered 6,664 ounces of gold, valued at \$113,452.17, an average yield of about 51¹/₁₀ cents per cubic yard, and a daily product of \$1,289.22. The duty attained for the water used was 10²/₁₀ cubic yards per miner's inch. Washing operations were confined to the removal of the top deposits, with the exception of 66 hours' washing on the Lower Bench, when water was used to remove the broken rock excavated while lowering and advancing the main bedrock sluice out to make the grade necessary for the removal of the gravel from the Lower Bench to the dumps. The increased duty attained for the water used was owing to the thoroughly disintegrated condition of the indurated top clay capping and hard top gravel deposits lying on the rims, produced by the three bank blasts successfully exploded during the winter and spring. The small product secured for the run was owing to a falling off in the yield of the gravel on the east side of the channel, caused apparently by a short turn of the east rim to the west,

which continued at an angle of about 40 degrees for a distance of about 150 feet up stream. This sharp turn induced a crossing of the current in the ancient stream from west to east, which eroded under and caused immense slides of bed-rock to fall from the east rim into the ancient channel, that replaced the high-grade deposits found so continuous before the deposit of slide-rock was encountered. The inclusion of so large a mass of barren slide-rock and low-grade deposits during the run was disappointing, but not discouraging; for it is well known that such cross-currents and accompanying low-grade deposits are of common occurrence in all ancient and modern streams, and are usually followed by higher grade stratified gravels, deposited on the bars and benches formed above such current crossings.

The second run, commenced on the 4th day of August, included a period of 16 days 5½ hours, ending with the exhaustion of the water supply on the 29th day of August.

During the progress of the second run 40,573 miner's inches of water were used to wash from the Upper Bench 215,036 cubic yards of clay gravel and slide rock, from which was recovered 1,687¹/₁₀ ounces of gold, valued at \$28,821.34, an average yield of 14³/₁₀ cents per cubic yard, and a daily product of \$1,835.12. The duty attained for the water used was about 51³/₁₀ cubic yards of gravel per miner's inch. The falling off of the duty of water below that of the first run, resulted from the inclusion of a large quantity of broken rock removed from the slide deposit. The complete removal of the deposit of slide-rock and the great improvement in the value of the deposits as the workings were advanced up the stream, explains the cause of the increased daily product for the run.

During the progress of the season's operations, about 3,126 cubic yards of gravel from the Lower Bench was washed through the main cut and sluice section No. 1, from which was recovered coarse gold, amalgam and nuggets valued at \$3,978.00, an average yield of about \$1.27 per cubic yard of gravel washed. This product is included with that of the previous runs.

Had the water supply been sufficient to carry the season's operations to the 1st of November, the product for the season would probably have reached a figure equal to, if not larger, that of the season of 1900.

ROSSLAND GREAT WESTERN.

At the first annual meeting of the shareholders held in London a few weeks ago the Chairman, in referring to the business of the Company, said:—"A reference to the table on page 15 of the report will show you that the work of extraction of ore was only carried on for one hundred and seventeen days out of a period comprising some four hundred and fifty days. With regard to the strike and its origin and the manner in which it was successfully combated by Mr. Macdonald, the Le Roi shareholders were given a lucid and very fair account by Mr. Hill, the Chairman of that Company, at its meeting on Friday. Probably most of you have read it, and I need not therefore, travel again over ground with which you are perfectly familiar. I notice at that same meeting a statement was made that this company was liable for a profit wrongfully made out of stores sold to Le Roi mine. I do not think for a moment that that claim can be substantiated. I shall be glad to render any explanation in my power after I have done with regard to any item either in the balance sheet or in the profit and loss account upon which further light is wished by anyone present. In the meantime I may say, turning to the balance-sheet, that the item on the debtors' side £265,17s. 1d. sundry creditors, is made up of payments to lawyers here and in Rosslund for professional services and a payment to the Le Roi Company of £85. The large amount of £24,051 on the same side due in Rosslund comprises £11,000 due to the Northport smelter, and £9,600 due to the Le Roi Mining Company, also £2,150 due to the bank at Montreal for loans, which have since been paid off. The same is the case with the bill payable to the Bank of Montreal £4,123. On the credit side of the balance-sheet there is a small item of £257 for a town lot on the Great Western and another on the Nickel Plate. Sundry debtors include about £13,600 due in London and £5,800 in Rosslund, a total—to be exact—of £19,480 3s. 9d. The whole of this, with the exception of £1,700 has since been paid. There does not appear to be any item in the profit and loss account which requires further explanation. With regard to the future of this property it must be clear to you from Mr. Macdonald's report that it must largely depend upon the value of the ore to be exposed on and below the 600 ft. level, and bearing upon this question Mr. Macdonald informs me that the shaft sunk on the Great Western proves that the south vein of the Le Roi runs right through the property. Owing, however, to the swampy nature of the ground in the neighborhood of the Great Western shaft and the consequent expense of keeping it in repair, it is not intended to use it, but to run a drive from the 600 ft. level to the Nickel Plate through the Golden Chariot and the Great Western, thereby exploring the vein between these points, a distance of about 2,000 ft. Having regard to the fact that your property lies within the recognized limits of the mineral belt, the belief is warranted that when your mine is fully developed it will be a profitable producer. Mr. Macdonald is present in the room, and will be pleased to answer any questions you may put to him. To this very short and rather bald statement I only want to add a few words of personal explanation. I understand from the tenor of the circular that you would very much like me to retire from this Board. I shall only be too pleased to go off the Board if that is your wish. I may say that as a Board we have endeavored during the last six months unsuccessfully to obtain practical mining men upon this Board as our Colleagues, but it is not so very easy to do that when a mine is going down hill and not up. All I would beg of you to do is to consider carefully before you make what is classically called a clean sweep. Do not make it so clean as to include everybody who is familiar with the affairs of the company. In that remark I am referring to my colleague, Mr. Dealtry, who has worked preserveringly at this mine. Although I do not want to leave this Board, if you think my services are of any good, I trust the shareholders will continue the services of Mr. Dealtry, the secretary and Mr. Macdonald. As a matter of form, I now propose that the reports and accounts be received and adopted."

Mr. A. B. Dealtry seconded the motion.

CROW'S NEST PASS COAL.

The fifth report to the Directors covering operations for the year ended 31st December last shows:—

The net profits for the year after paying all operating expenses, and all charges of every kind at head office and mines, amounted to \$270,848.39. This amount has been derived from the various departments of the Company's business, viz: the sale of coal and coke, from waterworks, house rents, electric light, etc. After paying dividends at the rate of ten per cent. per annum a balance of \$28,142.89 has been carried forward to credit of profit and loss.

During the year the Company has issued \$500,000 new stock (under the authority of supplementary letters patent dated 19th February, 1901,) at a premium of sixty per cent. and \$300,000 premium paid in was also added to profit and loss account, making a total sum at credit of that account (including the amount already there from the earnings of 1900) of \$517,017.41.

The Directors are pleased to state that the Company's operations are progressing most satisfactorily under the management of an efficient staff. They have reason to expect still more satisfactory results will be shown at the end of the present year.

SULTANA MINE OF CANADA.

The Directors herewith submit the Balance Sheet and Profit and Loss account for the period from the 1st October, 1900, to 30th Sept., 1901.

During the year £12,161 16 1 has been spent at the Mine as follows:—

Mine Development	£3,100	12	0
On Buildings, Boats, Assay Plants, Mine Equipment and Electric Light, etc.	564	13	11
Working Expenses in Canada charged to Profit and Loss Account	8,496	10	2
	£12,161	16	1

During this period gold has been won to the value of £8,186 17 10, made up as follows:—

Per Mr. Strong's Report....	\$36,329	95
Bullion credited by Bank on 2nd Oct. not included in Mr. Strong's Report.....	1,516	78
Proceed of concentrates....	1,614	10

\$39,460 83 at 4.82 equals £8,186 17 10

The Directors regret that their anticipations of good returns from the ore body at the south shaft referred to in the last report have not been realized, for some time payable quartz was won, but it became gradually lower in value and was abandoned for the time being. Disappointed here, the Directors, acting on the advice of the Manager decided to concentrate their efforts on locating the faulted ore body. This as is shown in the Managers Report enclosed herewith, they are hopeful, has been accomplished.

The Shareholders will, no doubt, remember that in October an issue of 5,000 Preference Shares of £1 each was made on certain terms and conditions, nearly 4,000 of these shares have been applied for and with the funds so obtained the Directors are driving the seventh Level North East, with a view to proving the existence of the ore body as located by the diamond drills. Definite information should be received from the Mine about the end of April. In the meantime, two drills are engaged stoping ore above the third Level, and the mill will be put into operation on day shifts early in January, 1902.

COLONIAL COPPER COMPANY.

This Company, now engaged in erecting an extensive copper mining and smelting plant at Cape D'or, Bay of Fundy, Nova Scotia, has issued the following statement of its finances as at 31st, December last:—

Assets.

Mines, Real Estate and Property.....	\$ 10,000,000.00
(Including all Property, together with improvements, machinery, buildings, etc.)	
Treasury Stock (885,569 shares).....	885,569.00
Furniture and Fixtures.....	1,477.30
Accounts and Notes Receivable.....	173,984.64
Cash.....	43,914.32

Liabilities.

Capital Stock.....	5,000,000.00
Accounts Payable.....	3,815.76
Surplus.....	6,101,129.50

\$ 11,104,945.26

During the past year we have sold 203,832 shares of the Treasury Stock, on which we realized \$292,727.25, leaving a balance of 885,569 shares on hand. Our accounts receivable and cash on hand December 31st, 1900, as in last year's balance sheet, amounted to \$89,676.35. By adding to the latter the receipts for the past twelve months, and deducting from the result \$217,898.96 (present cash and accounts receivable) shows a gross expenditure of \$164,504.64 for the year.

The disbursements at the mines for salaries, machinery, tools, buildings, land purchased, supplies and incidental expenses of all kinds, amount to \$154,280.56. The New York office expenses were \$10,224.08, which includes rent, salaries paid to officers and employees, printing, advertising, express, postage, together with all sundry and incidental items.

Referring to the matter of liabilities, our accounts payable at the close of the fiscal year amount to the nominal sum of \$3,815.76. This comprises sundry items which could not be audited and paid prior to closing the books. It has been the managements policy since the organization of this corporation to pay cash for everything, thereby saving all cash discounts, and enabling us in every instance to buy at much lower prices than we could on time purchases. This fact must be an additional assurance to those financially interested, as without debts we can supply our first earnings to the payment of dividends.

ST. EUGENE CONSOLIDATED.

The following is a statement of the financial affairs of this company, covering the operations for the year ended 30th September, 1901:—

Assets.

Mines and Mineral Claims	\$3,200,000	00
Cash in Banks—		
Bank of Toronto (Rossland).....	\$105,741	45
" (Toronto).....	4,093	00
		109,834 45
Machinery, Buildings and Equipment—		
Compressor Plant	\$13,954	24
Boiler Plant.....	6,477	57
Concentrator Plant.....	42,862	88
Air Lines	11,693	24
Tramways	11,911	31
Machine Drills and Fittings.....	5,121	97
Mine Buildings	14,440	15
Offices and other Buildings	13,698	68
Flumes.....	19,708	78
Cars and Rails	10,135	86

Stores on hand	150,004	68
Toronto Office Furniture.....	27,168	41
Accounts Receivable.....	307	23
Capital Stock Discount.....	10,465	87
	134,100	00

\$3,631,880 64

Liabilities.

Capital Stock.....	\$3,500,000	00
Accounts Payable—		
War Eagle Con. M. & D. Co.	\$2,145	97
T. G. Blackstock	4,375	00

Profit and Loss	6,520	97
	125,359	67

\$3,631,880 64

Profit and Loss Account.

To Cost of Mining and Development—		
Labor and Supplies	\$213,129	95
Compressor Labor.....	5,090	16
Compressor Supplies	7,309	06
Machine Drills and Fittings	7,492	36
Tramway Expense	5,411	41
Salaries.....	8,196	64
Office Expense.....	2,388	01
Assay Office Expense.....	1,825	93
Surveying	1,180	79
Concentrator Expense.....	34,236	93
Sundry Expense	1,628	93

287,889 86

To Amount written off for Depreciation—		
In Plant, etc.....	20,019	12
To Travelling Expenses.....	511	50
" Interest and Exchange.....	2,522	70
" Legal Expenses	436	88
" Mine Accidents.....	113	00
" Taxes	12,210	02
" Insurance.....	1,185	50
" Consulting Engineer's Fees	1,100	00
" Auditor's Fees.....	155	00
" Trail Smelter Examination Expenses	2,670	79
" Managing Director's Salary.....	4,375	00
" Capital Stock Discount	14,900	00

\$384,962 80

To Dividends Nos. 1 and 2.....	\$210,000	00
" Balance carried forward	125,359	67

335,359 67

By Balance brought forward.....	\$684,322	47
" Ore Sales (20,020 tons).....	124,909	03
" Rents	556,040	11
" Transfer Fees.....	3,351	58
	21	75

\$684,322 47

CANADIAN GOLD FIELDS SYNDICATE.

The following is excerpted from the report to the Directors submitted at a meeting held on the 4th ultimo:—

During the year 1901, mining in British Columbia was carried on under most trying conditions, namely: serious labor troubles, excessive freight and treatment charges on lead ores, and the remarkable fall in price of both lead and copper. That the industry has been able to survive these troubles and difficulties, is but an additional proof of the wonderful extent and richness of the mineral deposits of that Province.

In December 1900, the English price of lead was £18 per ton. The present price is £10 16s, or considerably below the average price of the last twenty years. Present indications are that the price will again advance within the next few months.

One great drawback to the profitable mining of silver and lead ores, has been the fact that the smelters charged an excessive freight and treatment rate, and shipped all of the smelter product out of the country to be treated in foreign refineries. The Dominion Government have recognized the burden under which the industry was laboring, and have granted a measure of relief (altogether too little in my opinion) in the way of a bounty for the production of pig lead from ores mined and smelted in Canada, extending over a period of five years. This has induced the C. P. R. to begin the erection of a lead refinery in connection with their smelter at Trail, B. C., which they expect to have ready for operating about the middle of May, 1902. The British Columbia smelters have announced a reduction in freight and treatment charges of from three to four dollars per ton on silver lead ores, taking effect January 1st, 1902.

It will thus be seen that the situation has materially brightened within the past few weeks. I confidently expect to see it still further improved and expect in the early spring to see the St. Eugene concentrator operating to its full capacity earning dividends for the stockholders of the St. Eugene Consolidated Mining Company Limited, in which the Canadian Gold Fields Syndicate Limited, are interested to the extent of 640,000 shares.

DIVIDENDS.—In spite of the adverse conditions referred to, we have been able to pay our stockholders two dividends or three per cent. each during the year 1901, amounting to \$35,746.68. These dividends were earned before the price of lead went down to the present low figure.

THE SLOCAN SUNSET.—The bond on the "Sunset" property, near Whitewater, B. C., which was taken in June 1900 was thrown up on March 31st, 1901. Continuous development work had been carried on in the interval and about 53 tons of high grade ore was taken out and shipped. The ore was very bunchy and finally pinched out, so the bond was thrown up. It is to be regretted that the "Sunset" property in no way justified the report made by the Company's Mining Engineer. His connection with our company ceased on April 1st, 1901.

THE COMMONWEALTH GROUP.—But little work was done on the Commonwealth Group during 1901. Owing to the adverse conditions previously referred to I deemed it advisable to curtail our operations. A tunnel was driven 126 ft. on the Commonwealth vein; a new trail made to the upper workings and a comfortable cabin 16x20 ft. erected near the mouth of the upper tunnel. The new tunnel cut through the top of an ore chute about 40 feet long and from 2 to 4 ft. wide, of a good grade of ore, but the tunnel had not reached the ore chute towards which it was being driven, when work was suspended for the season. The Canadian Gold Fields Syndicate Limited, own 400,000 shares out of the 700,000 issued shares of the Commonwealth Mines, Limited, leaving 800,000 shares still in the treasury of the Company.

THE TRUE BLUE.—Work on the properties of the True Blue Copper Mines, Limited, near Kaslo, B. C., has been steadily carried on since March 1901, with very gratifying results. A good ore chute of very high grade copper ore, is now being opened up on two levels. The pay or chute in the upper level is 16 inches wide but on the intermediate level it has widened to 4 ft. The cross-cut tunnel has intersected the vein on the third level showing it to be 15 ft. wide, but the ore chute has not yet been reached. The cabins on the property have been repaired and put in good condition; a large ore sorting house has been erected at the mouth of the lower tunnel; a new trail has been made from the property to Kaslo, and four of the claims have been surveyed and applications filed for Crown Grants. Two car-loads of high grade copper ore are now en route to the smelter, and the smelter returns will be known within a few days. There are at least ten car loads of similar high grade ore, blocked out in sight. All of this has been accomplished on an expenditure of \$7,500.00 of which the Canadian Gold Fields Syndicate Limited, has only furnished \$5,000.00 the balance being the proceeds of the sale of 50,000 shares of True Blue Stock to the business men of Kaslo. Further development work should be done on the True Blue Group, as the property is now one of proved merit. I believe that our investment in the True Blue Copper Mines, Limited, will not only re-coup us for our loss in the Slocan Sunset, but will make us a substantial profit. It will be necessary, however, to have further funds to carry on the work in order to put the property on a paying basis, but the present good showing of ore abundantly justifies going ahead with the work. As soon as the returns have been received from the ore now en route to the smelter, an opportunity may be presented the stockholders of the Canadian Gold Fields Syndicate, Limited, to purchase shares of the True Blue Copper Mines, Limited, at five cents per share, to the amount of 250,000 shares. This would provide a fund of \$12,500 which will be spent exclusively on the further development of the True Blue Group and I believe will result in putting that property in a position to justify the erection of an aerial tram and the beginning of regular shipment. The aerial tram would result in a saving of about \$4.00 per ton in the marketing of the True Blue ore. It will be remembered that the True Blue Copper Mines, Limited, is incorporated under the laws of British Columbia with an authorized capital of \$1,500,000, divided into 1,500,000 shares of a par value of 10 cents each. Of this about 750,000 shares have already been issued leaving 750,000 shares still in the treasury of the company. The Canadian Gold Fields Syndicate, Limited, own 390,000 shares, or a little over 50 per cent. of the issued capital of the company. It is high-

ly desired that the Canadian Gold Fields Syndicate, Limited, and their friends, should continue to hold control of the True Blue Company so as to direct its management and protect our large and valuable interest.

SUNSET NO. 11.—No work was done on this Group of properties during 1901. I am of the opinion that an arrangement can be made with English capitalists to take over our Rossland properties, forming an independent company with ample working capital. I am working on the details of such a plan and in a short time will submit the whole matter to your consideration.

"JENNIE AND ELDON" Mineral Claims.—No work has been done on either of these claims during 1901.

ST. EUGENE CONSOLIDATED MINING COMPANY LIMITED.—Our holdings in this company still stands at 640,000 shares of the par value of \$1.00 each. Owing to the low price of lead, and that fact that none of the Canadian smelters could handle the output, the St. Eugene concentrator was only operated for about five months in 1901. During that time about 11,000 tons of silver lead concentrates were shipped mostly to Antwerp. The St. Eugene Consolidated has paid two dividends amounting to \$210,000.00 and at the end of their financial year had a cash balance on hand of \$125,359.67. The Canadian Gold Fields Syndicate, Limited, received \$38,400.00 in dividends from the St. Eugene Consolidated; while our holdings in that company only cost us \$145,448.23. It will thus be seen that the investment was a highly profitable one, as it yielded us a return on our investment of over 25 per cent. for 1901. Development work has been steadily carried on all through the year, and there are now over 200,000 tons of ore blocked out in sight in the mine. A shaft has been sunk for a distance of one hundred and forty feet (or over sixty feet below the level of Moyie Lake), and there is no water to bother or interfere with the work. A level is being driven 125 ft. below the collar of the shaft and in a short time the big ore chutes already opened up in the tunnels above, will be developed on this new level. This will practically double the amount of ore in sight. These ore chutes have already been proved to a depth of 300 ft. by diamond drills so it is merely a question of doing the work to block out the ore. The St. Eugene Consolidated continues to justify the claim made for it—that it is one of the biggest lead mines in the world. The concentrator has been still further improved so that it now has a capacity of 425 tons per day. Owing to the improved conditions it is confidently expected that the St. Eugene Consolidated will resume shipments at an early date.

WINDERMERE DISTRICT.

This winter has been marked by steady progress in the mines of this district. Whilst there is nothing notable to record we learn that the various properties are showing up in a manner satisfactory to their respective owners and justify more attention to this district than capitalists have so far accorded it.

No large shipments of ore will be made from any of the mines as on account of the unsatisfactory condition of the metal market at present only such ore has been taken out as has been encountered in the course of opening up the properties.

Your correspondent estimates that the amount of ore to be forwarded to the smelters when navigation opens in April will be as follows:—

From the Paradise Mine.....	150 to 200 tons.
“ McDonald Creek Mines.....	80 to 100 “
“ Delphine Mine.....	70 to 80 “
“ M. T. Mine.....	30 to 40 “

Most of this ore is now at the Columbia River awaiting the steamers' arrival.

A GOLD DREDGING RECORD.—The establishment of the gold-dredging industry in New South Wales has been attended by many bitter disappointments and much financial loss, the bulk of the public flotations having been disastrous failures. This notwithstanding, a number of companies have demonstrated that on certain watercourses and with plants adapted to local conditions, gold dredging can be carried on profitably. Four of the public companies have reached the dividend-paying stage. Among these the Araluen Central is quoted by the Sydney "Daily Telegraph" as a conspicuous success. For some time past this dredge has held the record for Australia, and in one week recently working short time (110 hours), it recovered 165½ oz. gold, thus eclipsing its previous best return of 152 oz. When the fact is considered that there is almost sufficient clear profit in this return to pay a 6d. dividend on 10s. shares, it will be recognized that the shareholders have one of the few prizes among many blanks.

MINING ENGINEER.

WANTED—Position by Mining Engineer with 20 years practical experience in charge of iron and coal mines in England. Surface and underground work; boring, sinking, and developing; erection of machinery; management of men, etc. Holds English Government certificate as Colliery Manager.

Address:

H. WILSON, 1570 Ontario St., MONTREAL.

Molly Gibson.—Shipments this year have been as follows :

1902	Tons.	Assay Value.	Freight and Treatment.	Nett Value.	Average Net Value per Ton
January . . .	266	\$11,392 15	\$2,790 80	\$8,601 35	\$32 34
February . .	447	16,232 33	4,184 91	12,047 42	26 99
Total . . .	711	\$27,624 48	\$6,975 71	\$20,648 77	\$29 04

The Number Five Tunnel is now in 200 feet beyond the cross-cut, making 450 feet in all. This work is being pushed as rapidly as possible. Cross-cutting to the parallel vein will be begun shortly, when shipments will probably be augmented.

**WANTED
FOR A LIBRARY.**

COPIES of Volumes I, II and III of the Federated Canadian Mining Institute ; Volumes I and II General Mining Association of the Province of Quebec ; Vols. I, II and III, Canadian Mining Institute. Cash will be paid for any or all of these copies.

Write "J.B.," *Canadian Mining Review*, Ottawa.

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We are open to act as Fiscal Agents in Boston and New England for the sale of the Treasury Stock of a good Mining Company. Address with full particulars

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FOR 1902

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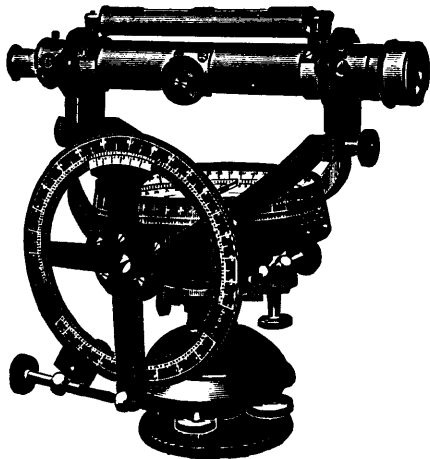
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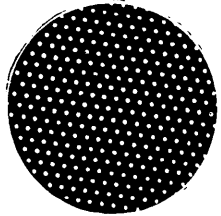
Gold Medals, Inventions Exhibitions, 1885, and Mining Exhibition, 1890

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3—Courses in Chemistry, Assaying, Mineralogy,

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For further information see the Calendar of Queen's University.

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For further information see the calendar of Queen's University.

Next Session begins October 3rd,

... 1900 ...

Matriculation Examination held at Queen's University, Sept. 20th.
Unmatriculated Students admitted to Special Courses.

The School is provided with well equipped Laboratories for the study of Chemical Analysis, Assaying, Blowpiping, Mineralogy, Petrography and Drawing. In the Mining Laboratory the operations of Crushing, Amalgamating, Concentrating, Chlorinating, Cyaniding, etc., can be studied on a large scale.

FOR CALENDAR OF THE SCHOOL AND FURTHER INFORMATION APPLY TO 

Dr. W. L. GOODWIN,

DIRECTOR

SCHOOL OF MINING,

KINGSTON, ONTARIO.

Did You Hear the Thunder?

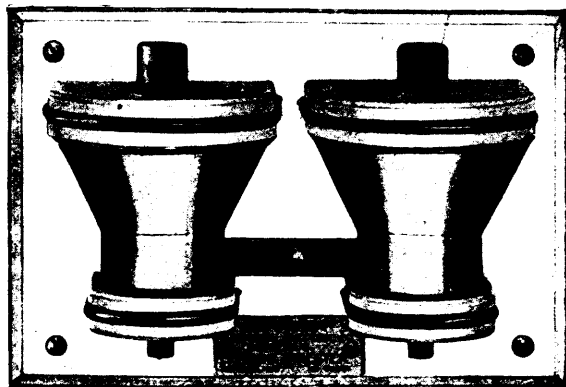
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Leases for Mines of Gold, Silver, Coal, Iron, Copper, Lead, Tin

—AND—

PRECIOUS STONES.

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

GOLD AND SILVER.

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

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

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

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

MINES OTHER THAN GOLD AND SILVER.

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

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

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

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

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

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

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

THE HON. C. E. CHURCH,

Commissioner Public Works and Mines,

HALIFAX, NOVA SCOTIA.

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ORNAMENTAL AND STRUCTURAL MATERIALS IN ABUNDANT VARIETY.

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

Mining concessions are divided into three classes:—

1. In unsurveyed territory (a) the first class contains 400 acres, (b) the second, 200 acres, and (c) the third, 100 acres.
2. In surveyed townships the three classes respectively comprise one, two and four lots.

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

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

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

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

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

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

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

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

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

The fullest information will be cheerfully given on application to

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



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 \$10.00 per acre for soft coal, and \$20.00 for anthracite. Not more than 320 acres can be acquired by one individual or company. Royalty at such rate as may from time to time be specified by Order in Council 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 \$10.00 per annum for an individual, and from \$50.00 to \$100.00 per annum for a company, according to capital.

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

The claim shall be recorded within fifteen days if located within ten miles of a Mining Recorder's Office, one additional day allowed for every additional ten miles or fraction. The fee for recording a claim is \$5.00.

At least \$100.00 must be expended on the claim each year or paid to the Mining Recorder in lieu thereof. When \$500.00 has been expended or paid the locator may, upon having a survey made and upon complying with other requirements, purchase the land at \$1.00 an acre.

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

The patent for a mining location shall provide for the payment of royalty on the sales not exceeding five per cent.

PLACER MINING, MANITOBA AND THE N.W.T., EXCEPTING THE YUKON TERRITORY.

Placer mining claims generally are 100 feet square; entry fee \$5.00 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 \$10.00 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 \$10,000.00.

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 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, \$100.00 per mile for first year, and \$10.00 per mile for each subsequent year. Royalty ten per cent. on the output in excess of \$15,000.00.

PLACER MINING IN THE YUKON TERRITORY.

Creek, Gulch, River and Hill Claims shall not exceed 250 feet in length, measured on the base line or general direction of the creek or gulch, the width being from 1,000 to 2,000 feet. All other Placer Claims shall be 250 feet square.

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

The person or company staking a claim, and each person in his or its employment, except house servants, must hold a Free Miner's Certificate.

The discoverer of a new mine is entitled to a claim 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 \$15.00. Royalty at the rate of five per cent charged on the gross output of the claim, with the exception of an annual exemption of \$5,000.00.

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, not exceeding ten in number, may work their claims in partnership, by filing notice and paying fee of \$2.00. 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 \$200.00, or in lieu of work payment may be made to the Mining Recorder each year for the first three years of \$200.00 and after that \$400.00 for each year.

A certificate that work has been done or fee paid 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*.

HYDRAULIC MINING, YUKON TERRITORY.

Locations suitable for hydraulic mining, having a frontage of from one to five miles, and a depth of one mile or more, may be leased for twenty years, provided the ground has been prospected by the applicant or his agent; is found to be unsuitable for placer mining; and does not include within its boundaries any mining claims already granted. A rental of \$150.00 for each mile of frontage, and a royalty of five per cent. on the gross output, less an annual exemption of \$25,000.00 are charged. Operations must be commenced within one year from the date of the lease, and not less than \$5,000 must be expended annually. The lease excludes all base metals, quartz and coal, and provides for the withdrawal of unoperated land for agricultural or building purposes.

PETROLEUM.

All unappropriated Dominion Lands shall, after the first of July, 1901, be open to prospecting for petroleum. Should the prospector discover oil in paying quantities he may acquire 640 acres of available land, including and surrounding his discovery at the rate of \$1.00 an acre, subject to royalty at such rate as may be specified by Order in Council.

JAMES A. SMART,

Deputy of the Minister of the Interior.

OTTAWA, 9th Dec., 1901.

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 ; zinblend, galena, pyrites, mica, graphite, talc, marl, brick clay, building stones of all kinds and other useful minerals have been found in many places, and are being worked at the present time.

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

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

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

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

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

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

HONORABLE E. J. DAVIS,

Commissioner of Crown Lands,

or

THOS. W. GIBSON,

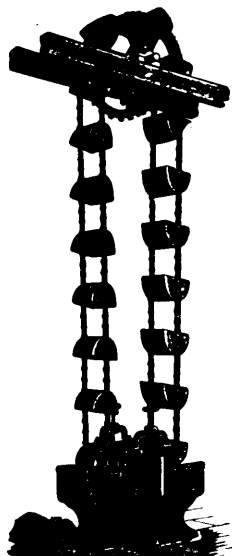
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Toronto, Ontario.

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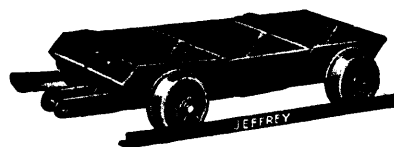


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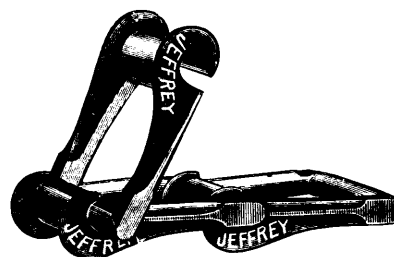
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