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NINETEENTH YEAR OF PUBLICATION

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Established 1882

Vol. XX—No. XII.

OTTAWA, DECEMBER 31st, 1901.

Vol. XX—No. XII.

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 A simple and very economical manner of utilizing the Direct Pressure of **COMPRESSED AIR**

**MINE STATION PUMPING.**

Two Tanks in the Mine—  
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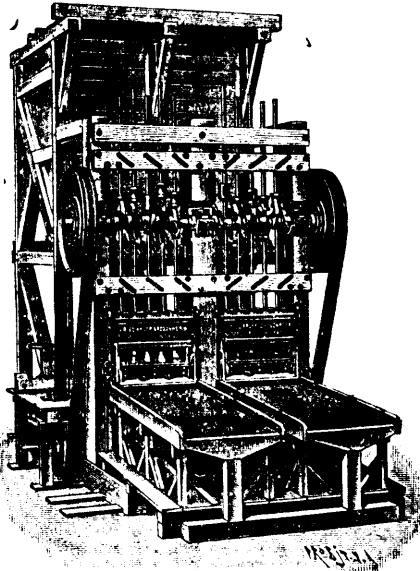
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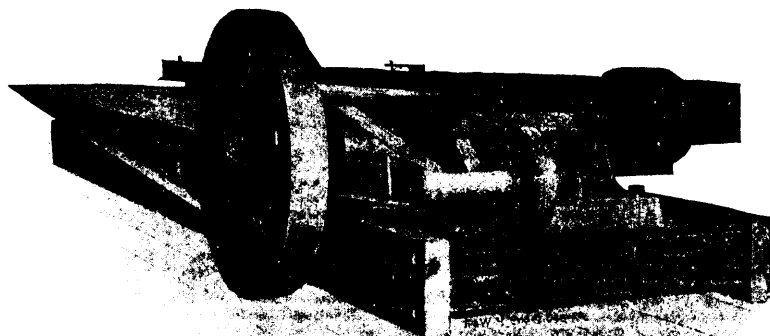
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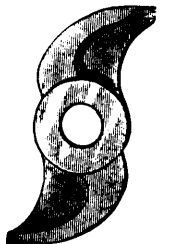
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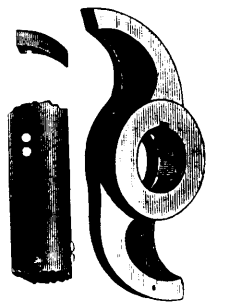
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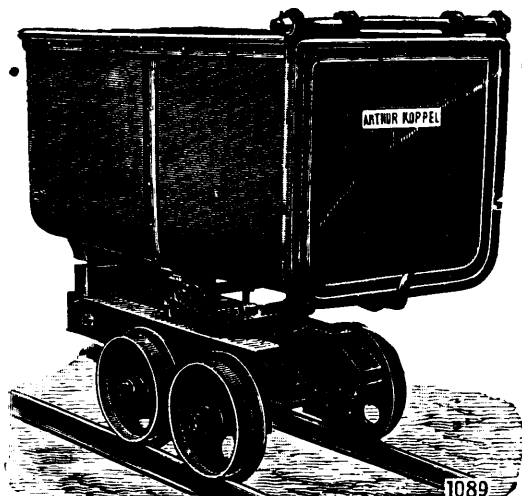
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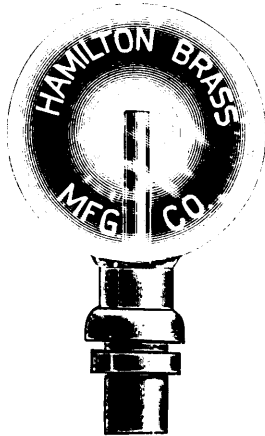
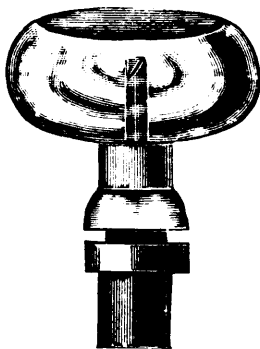
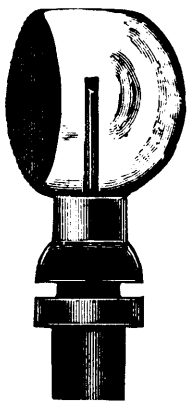
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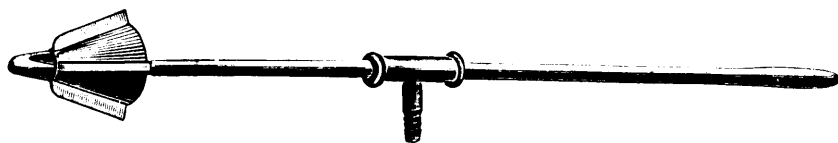
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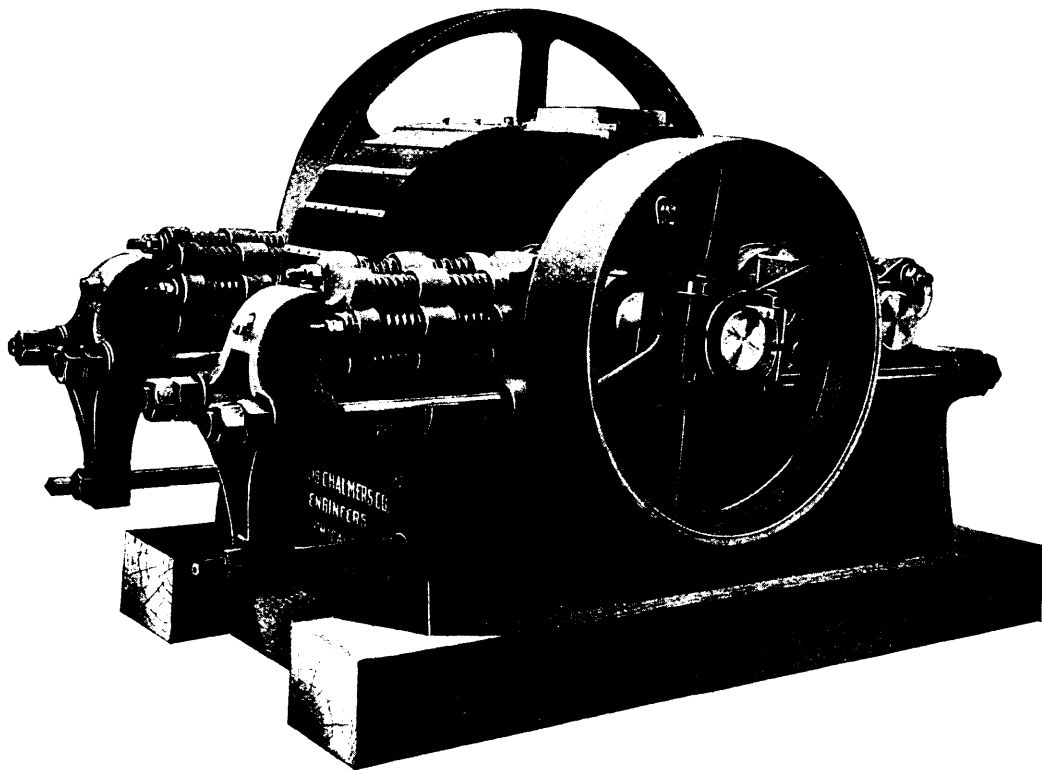
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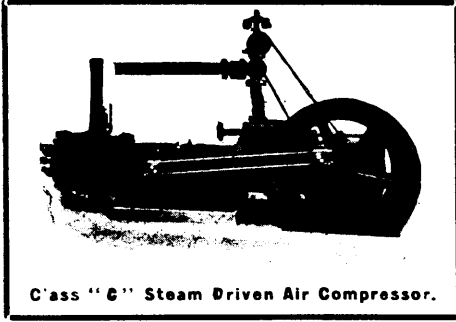
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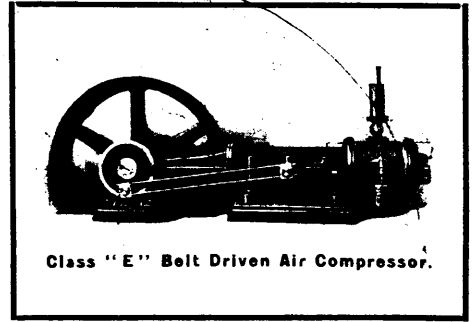
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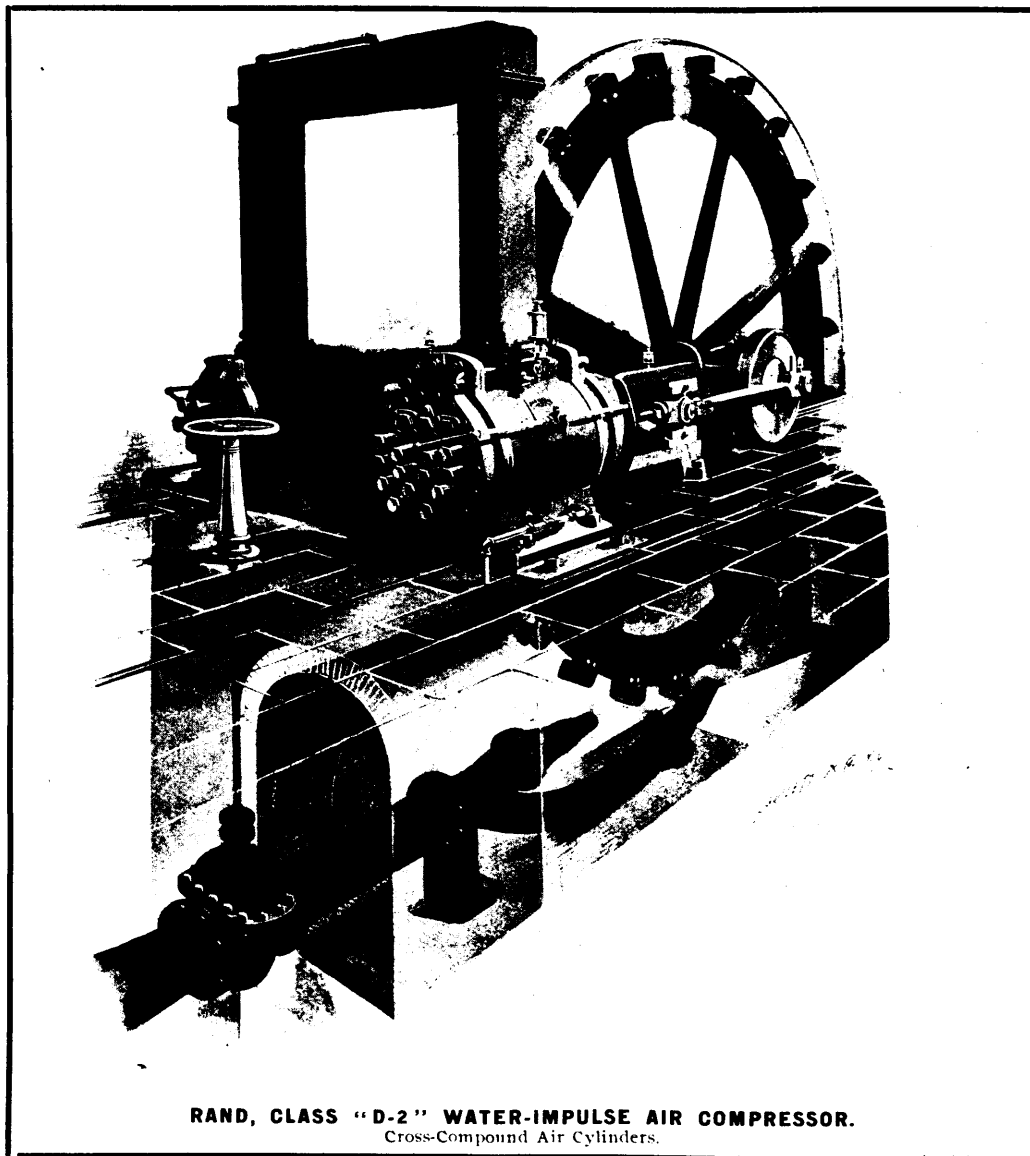
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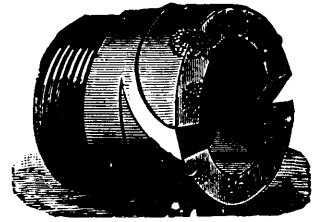
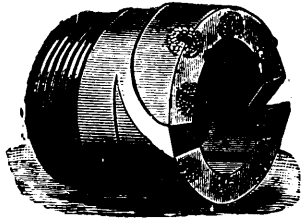
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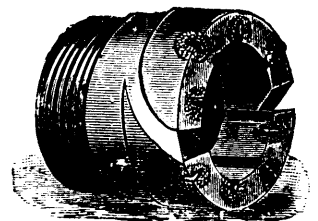
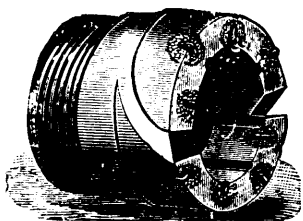
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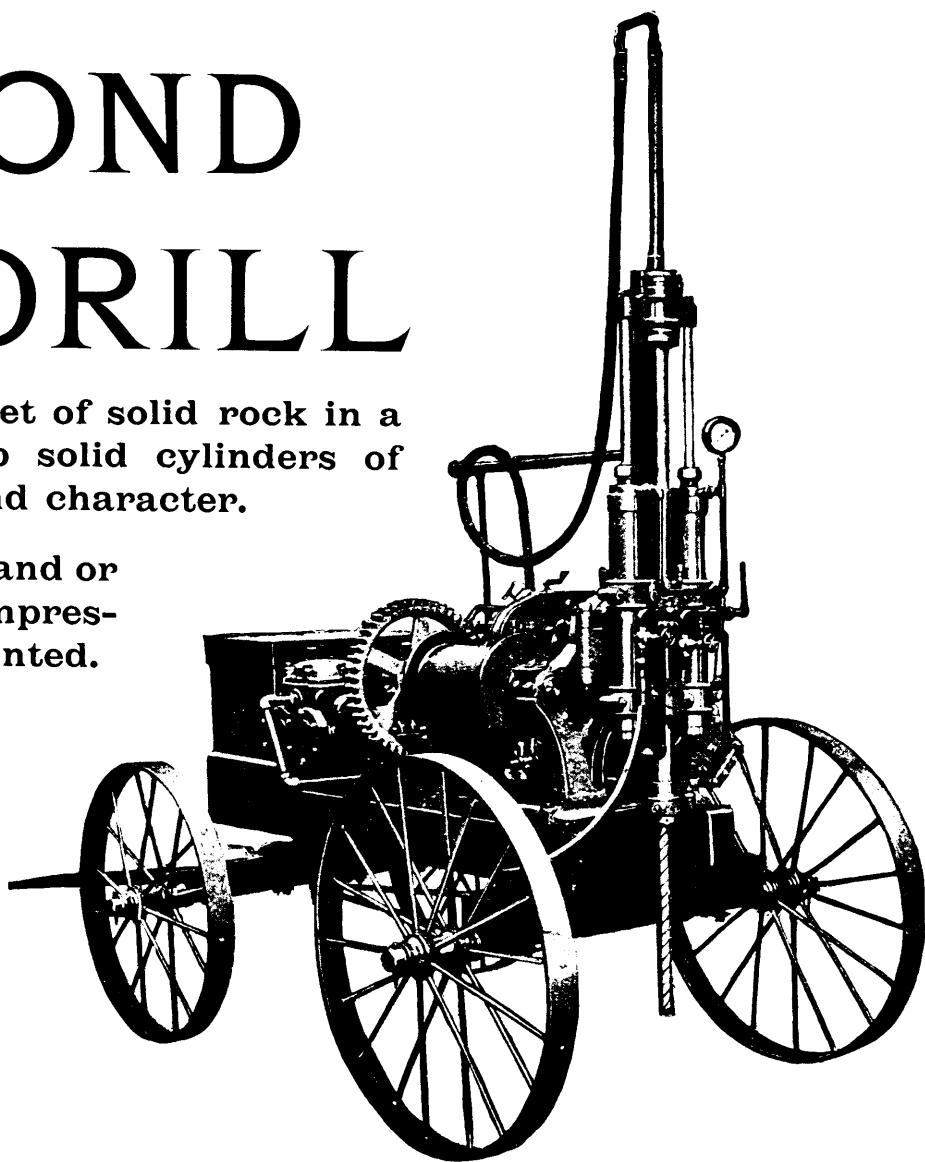
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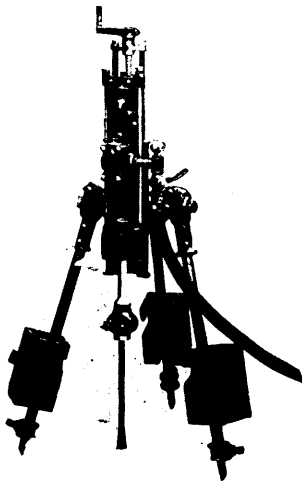
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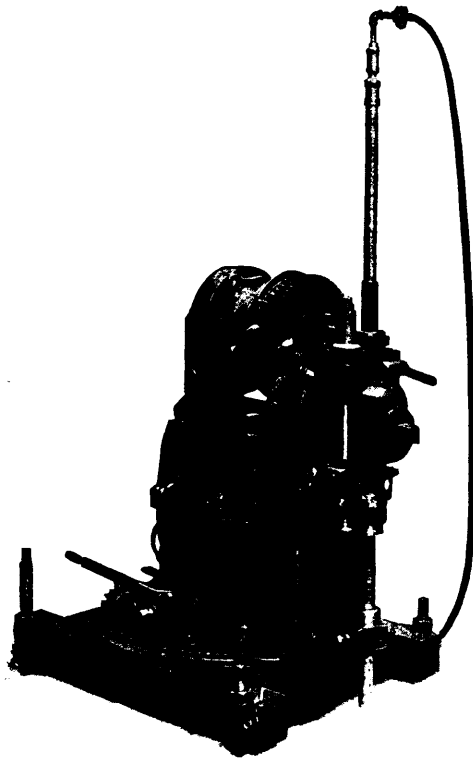
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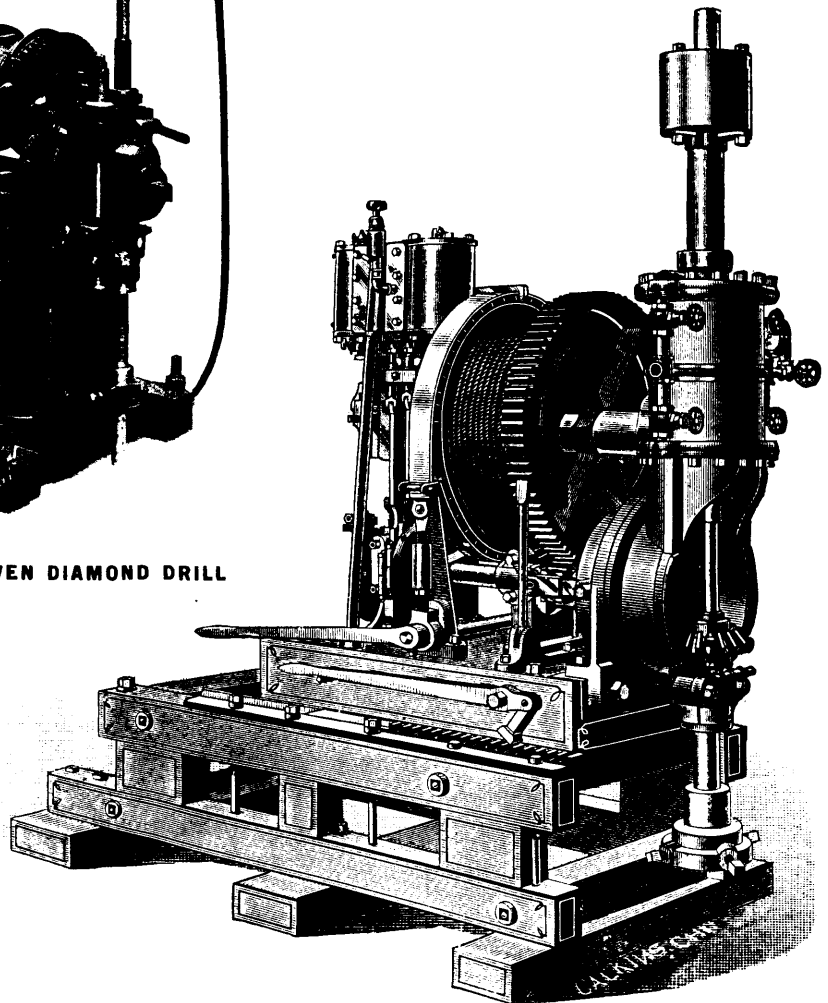
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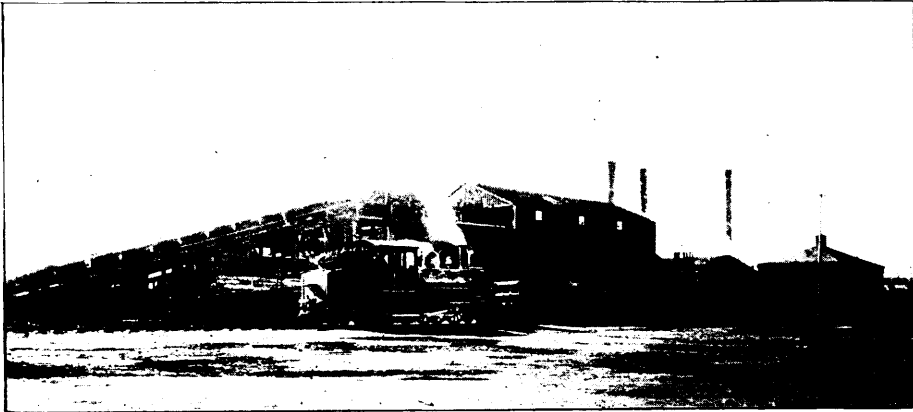
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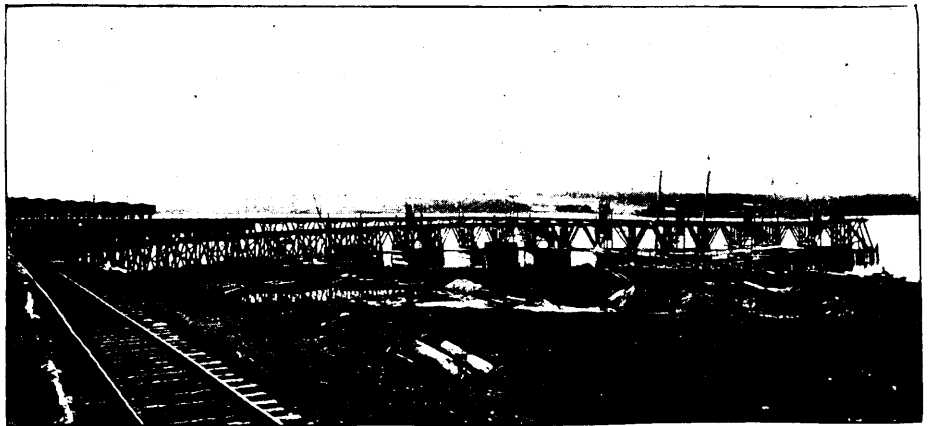
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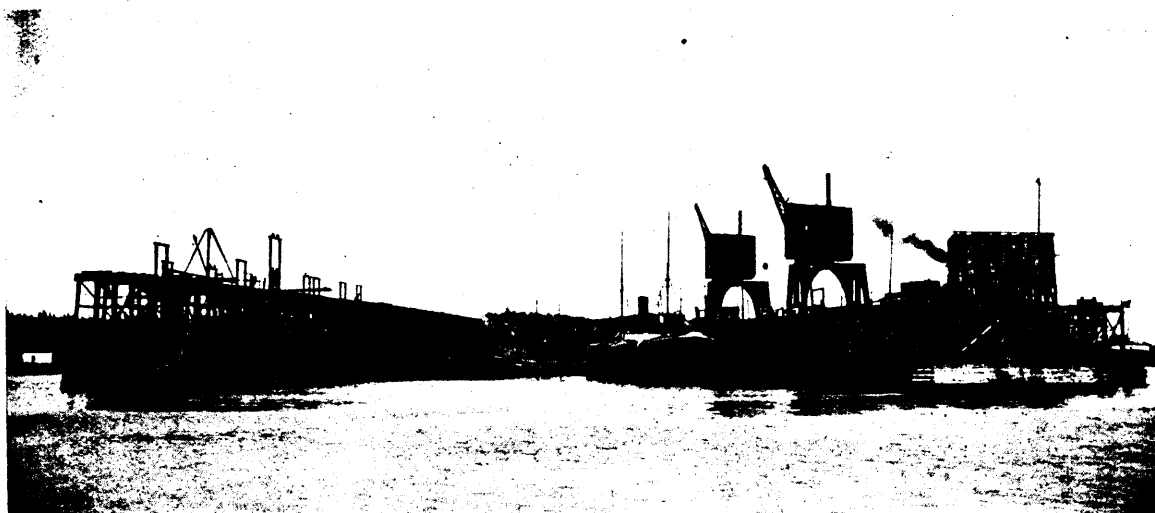
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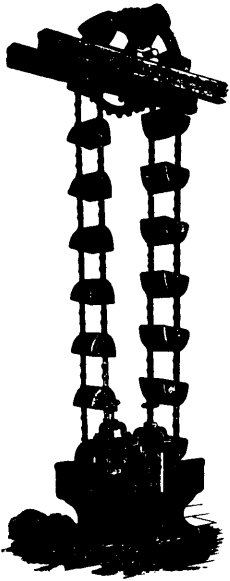
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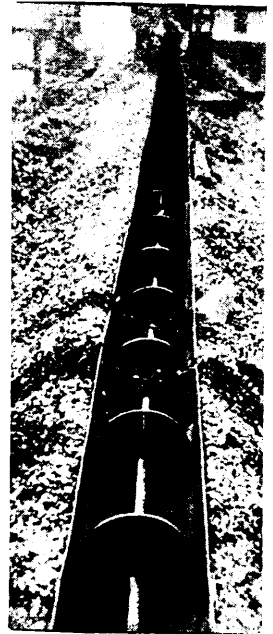


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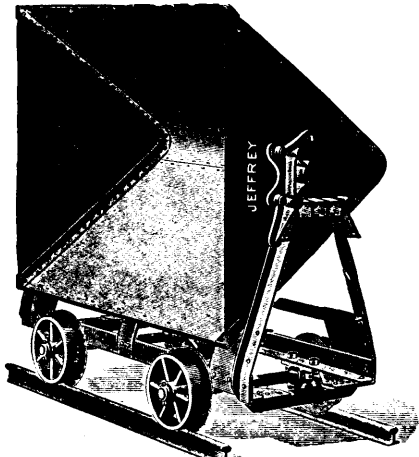
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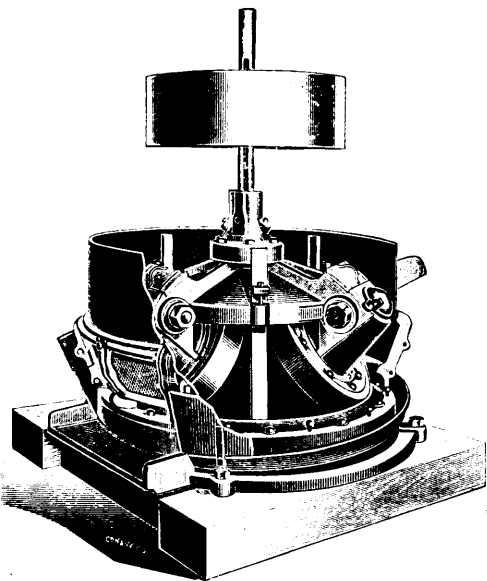
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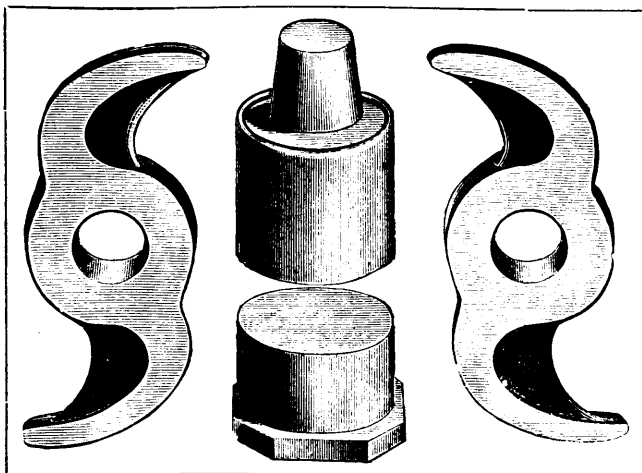
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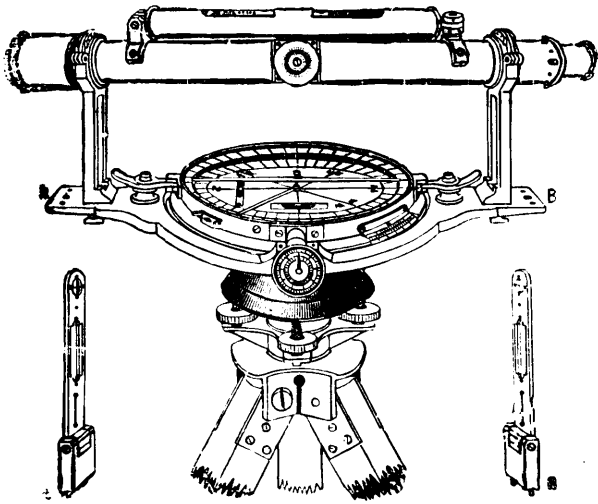
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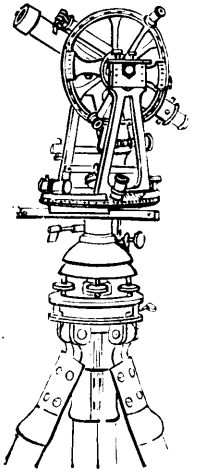
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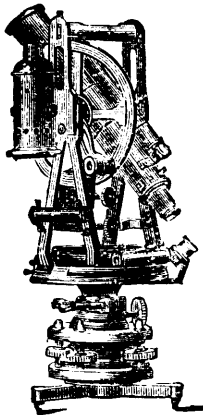
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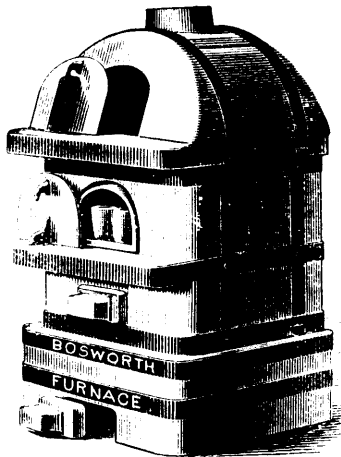
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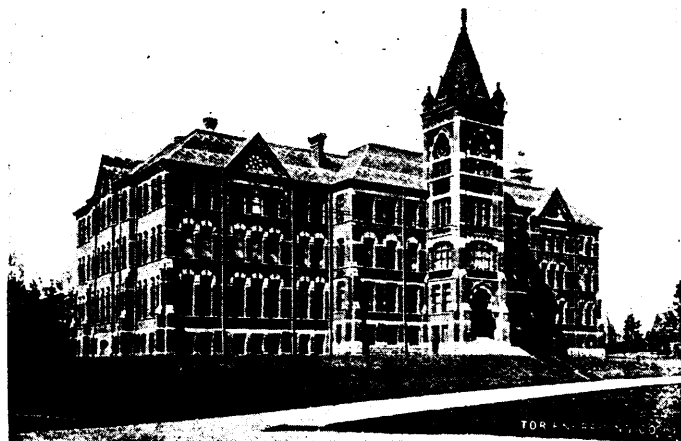
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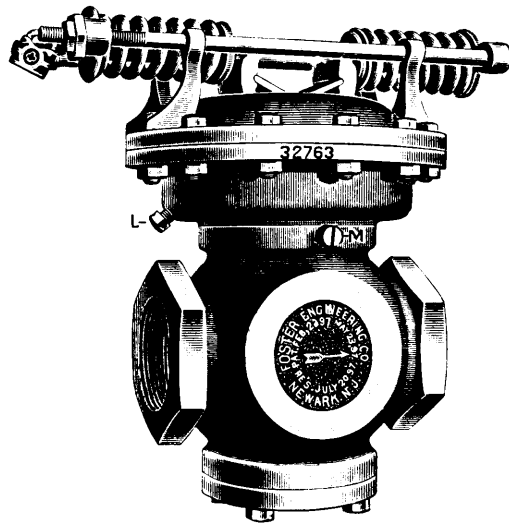
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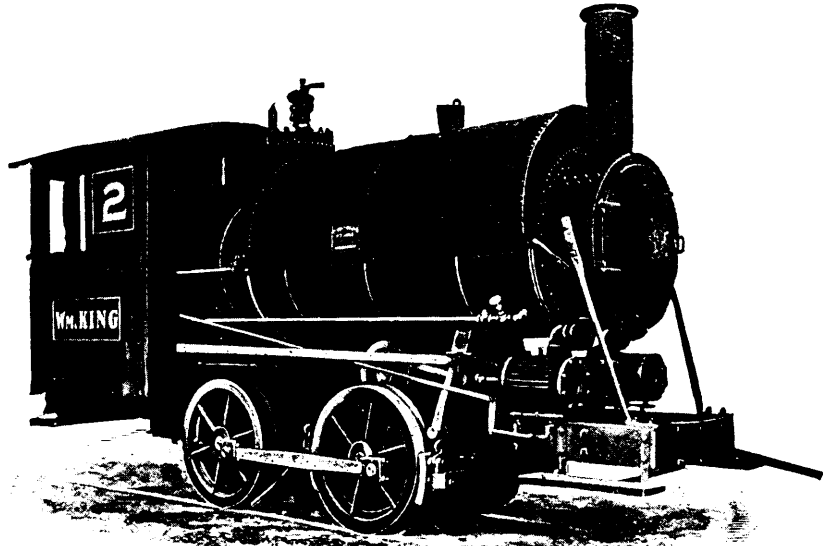
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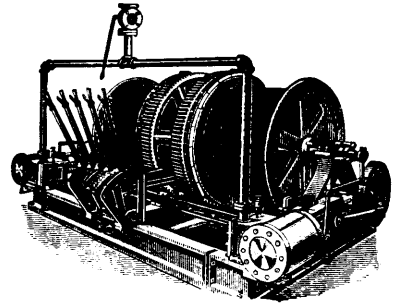
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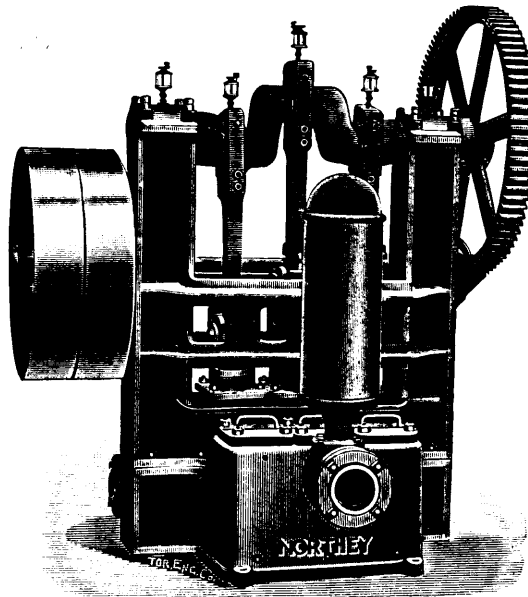
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19th YEAR OF PUBLICATION.

# The CANADIAN MINING REVIEW

Established 1882

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

B. T. A. BELL, Editor and Proprietor.  
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## Mining Experts.

An article with the above heading was recently printed by the *London Mining Journal*, which contains so much truth, and accords so well with our own sentiments that we reproduce it elsewhere in full. Besides the *Journal* several of our British exchanges, during the last month or two, have discussed what an expert really is, or should be, and the *Journal* has published some correspondence relating to the remarkable suggestion made by the president of the Institution of Mining and Metallurgy (Mr. C. Algernon Moreing) in his speech at the annual dinner of the Institution held on October the 17th. Mr. Moreing suggested that enrollment among the members of the Institution should be the "hall mark" by which the public could be sure that a man was a genuine qualified mining expert; to which the well known engineer, Mr. J. D. Kendall has objected, as an injustice to the many qualified men who decline to become members of the Institution. The correspondence (which has been carried through several numbers) is an illustration of the divergence of views which exists among engineers themselves, and is our excuse, if an excuse is needed, for bringing the matter prominently before the many mining engineers who form the constituency of the REVIEW.

One may search dictionaries and encyclopedias in vain for a proper and comprehensive definition of the phrases "Mining Expert" and "Mining Engineer." There is a distinction between them which is not generally appreciated by the public, and is not always kept in mind, even by engineers themselves, but which is, we venture to think, quite an important one. A mining *Expert*, to be worthy of the name, needs not only that knowledge of mine engineering in its details which the mining engineer has, but also that special and wider knowledge which embraces familiarity with ore deposits in many places and under diverse conditions, as well as knowledge of the *business* conditions attaching to the industry. To the school training of the engineer must be added that practical training in mining and metallurgy which is obtainable only by personal experience; so far there is common ground for both the engineer and the expert. In addition the expert must have a sufficient knowledge of, and experience in, practical geology to enable him to ascertain the structure immediately surrounding any given ore-body, and must also have that inborn, or acquired, business sense which enables him to balance the *certain* cost of production per unit (under existing conditions) against the *probable* income per unit, from the venture. He must also be able to put these figures, together with the factors accruing from improved facilities, before his client in a clear, businesslike, and easily understood way. His tech-

nical views must be indisputable, while his economic views should be worthy of the greatest consideration, and subject to revision only by those men who are masters of finance in the marketing of the particular metals or ores under consideration. The *Engineer*, on the contrary, is primarily a man who, to the scholastic and practical experience above mentioned, adds an experience in those engineering matters and details which relate directly to the working of ore bodies; he has a mastery of the details and the principles relating to haulage, winding, winning of ores, handling of men, construction and maintenance of machinery connected with mines, and perhaps also the methods of transportation and reduction of ores. He need not have, necessarily, a knowledge of the economic conditions under which similar ores occur in other countries, or other districts, and he need not have special knowledge of the district, other than the geology of the deposit; nor need he know the costs and expenses of other departments than the mine department.

That these definitions set a high standard for the man who is fit to bear the title of "Mining Expert" we are aware, but that such a standard should obtain is most desirable, and will become patent to all our readers who will think the matter over carefully. In the articles to which we have alluded it is pointed out that, frequently a property which has been inspected and approved by a competent engineer is but too often a commercial failure because of the subsequent development and management of the property being left in incompetent hands. In such cases the failure of the enterprise is usually put upon the shoulders of the examining expert, instead of being laid at the door of the directors who imposed incompetent management upon the shareholders, or who disregarded the advice of the engineer, or who themselves were incompetent through inattention to business, through inexperience or through rascality. The discredit which has attached to mining ventures in Canada for several years past, and which is yet constantly attaching, is due in no small measure to the reason just mentioned. If the numerous investors in mining shares in Eastern Canada had chosen really competent and able engineers of sound repute to make examinations of the properties they contemplated investment in, and had paid him such a fee as would have placed him beyond the reach of temptation; and subsequently had followed implicitly his suggestions, taking care to elect for their directors men who were *competent* to direct, and willing to give some time to their board meetings that they might know what their engineer advised, instead of spending their time chiefly with the market value of their shares, mining would have been a favorite investment instead of being regarded as utterly unreliable and speculative.

The *Financial News* has said that "in fairness to mining experts it should be added that only in a limited sense is he responsible for the career of the company after its flotation." If an engineer who reports upon a property is not retained in a managing, or advising, capacity he can in no sense be responsible for the subsequent career of a company, but if he is retained in the above capacity, he is responsible to the extent to which the directors give him power and back him up. "If in spite of good direction and skilled management, the business is a failure, then, indeed, the views of the expert may be questioned and his opinions challenged, but until the success or failure of a mine as a producer of saleable mineral has been demonstrated, independently of all financial, commercial or administrative interests, it is unjust to lay the whole burden of failure on the shoulders of the mining expert."

The last five or six years of mining in Canada have shown clearly that the public as a rule do not care a rap whether a mining venture is sound or not; they have regard only to the paper certificates for shares, and look upon them as the chips or counters of a gambling game. They have not cared whether the quoted value of shares was fictitious or real (as recently in the now famous War Eagle), the one thing they have cared for is to know whether "big financial lights" were in the deal, if so then they "were in the game." The shares may run up or go down, and the engineers at the mine are praised or blamed accordingly; but this is not mining, though for a time it may masquerade under that name. The rocket-like rise and fall of "War Eagle," "Centre Star," "Republic," "Montreal and London," "Knob Hill," "Payne" and other countless shares was no feature of *mining* but a characteristic feature of the *share market*, as the REVIEW has time and again pointed out in the last few years.

In considering our last paragraph we are brought to look closely at the men who have been *directors* of mining companies, occupying positions which in law are considered responsible, but who have hastened to disclaim their responsibilities, and put it on the shoulders of their managers. "We know nothing of mining!" has been a favorite phrase in Toronto and Montreal. It is not important whether directors know anything of the technicalities of mining or not, but it is important that they should attend to their proper business of directing the financial and administrative departments of their company, and they should be responsible for the selection of the management they choose to impose upon the shareholders.

The REVIEW wishes to go on record as stating plainly that, if an incapable manager is sent to a mine *it is not his fault that he is put in that position*, but it is entirely the fault of the directors who have put him there; in this view of the case how many of the mining failures in Canada during the last six years are chargeable to the managers? We state unquestionably that the greater number should be laid directly at the doors of the board of directors. When a board selects a raw student with a certificate from a school of mines, or a book-keeper from a commercial house, or a voluble wind-bag from a strange town, whose sleekness of address and sanctimoniousness of appearance enables him to pick dollars from peoples' pockets in exchange for scraps of printed paper, that board, and not its appointees, are responsible to the shareholders and to the public whom they invite to purchase their shares. In other words, suppose real mining experts, as a class, are willing and anxious to do their duties to the community, is the community willing to, and does it, do its duty to them? In Canada during the last six years the answer unquestionably is "No."

An expert must keep in mind his own good reputation and the interests of his employer, and he also must have regard to the interests of the public to whom his employer may impart his opinion for the purpose of obtaining public support. That legislation, or enrollment,

in the membership of any technical institution, will, or can, enable the public to select *only* competent men to advise them, is in the highest degree improbable. No law, anywhere in the world that we know of, prevents any individual calling himself a mining expert, and membership in an organized body, society, or institution, as a rule, does not mean that its members are guaranteed to the public as qualified and honest; but simply means that one pays so much per year for the privilege of membership.

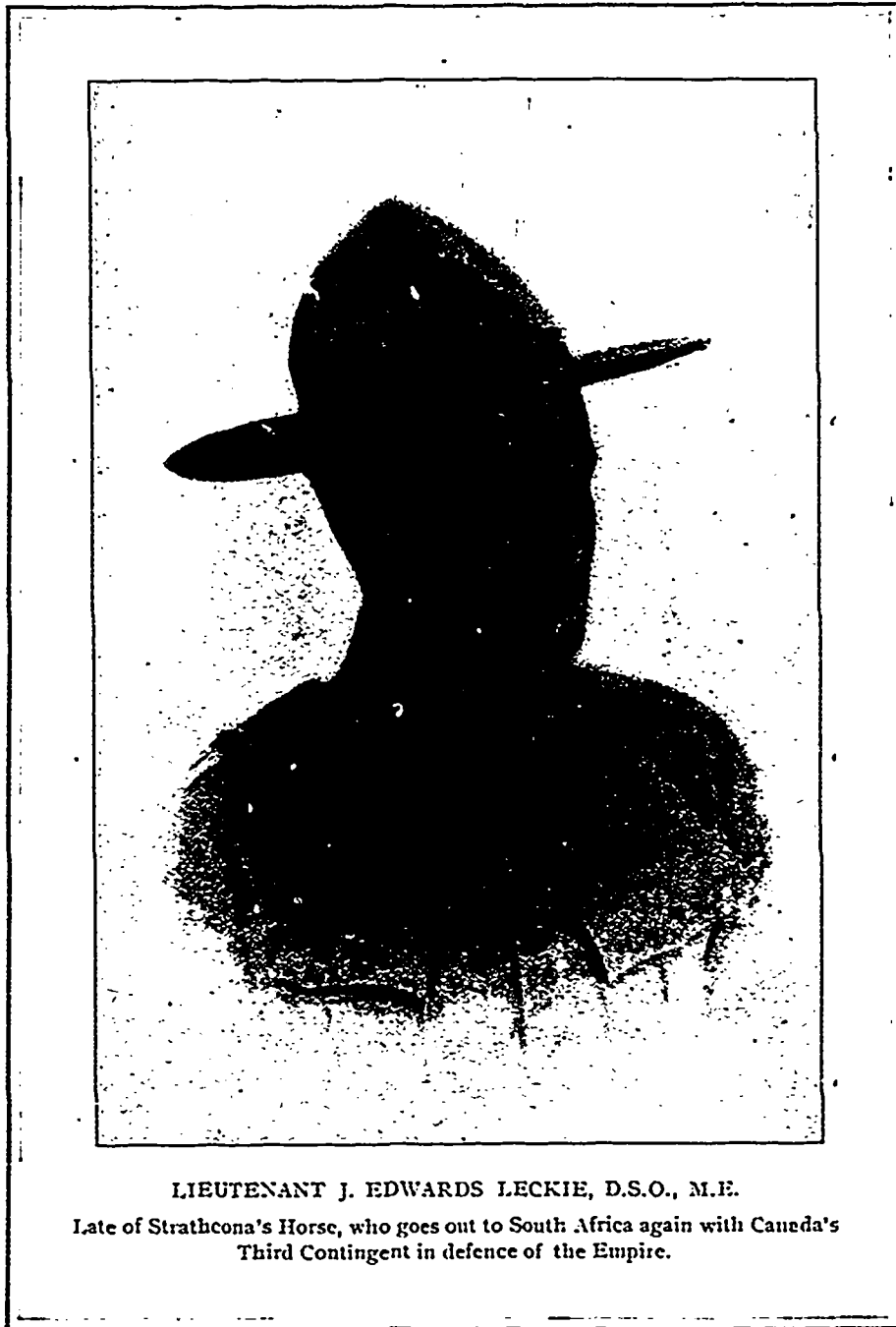
While the REVIEW agrees in the main with the desirability of putting, as Mr. Moreing says, a "Hall Mark" upon engineers, that the public may in a measure know who is qualified and who is the genuine article, yet we are equally in agreement with Mr. Kendall that membership in any institution would be an unjust criterion for a large number of fully competent engineers who may not choose to become members of that institution. The REVIEW has gone over this ground before, at the time when the Canadian Society of Civil Engineers sought to impose membership in that society as a qualification for any engineer electing to practice in Canada; the arguments we then used hold good now against Mr. Moreing's suggestion of membership in the Institution of Mining and Metallurgy. Were it possible to safeguard the practice of mining engineering as the practice of medicine is safeguarded, and without a concurrent obligation of membership in a society, the REVIEW believes the mining profession would thereby be placed upon a better basis, but at the present time this is impossible, and the man who is able, capable and honest needs no further vouching than his record, and his clients, give him.

No man who lacks a thorough training both practical and technical as an engineer and metallurgist, and who has not added to his training a wide experience in the management of mines or metallurgical works should presume to offer his services as an expert. It is not the best miner, nor the best metallurgist, nor the best manager, who can necessarily best perform the varied duties of an expert; such a one is he who combines with a broad experience a sound and well trained financial judgment. In the last analysis of this question the responsibility for a good engineer lies with the investor, for so long as men are willing to employ men of uncertain reputation, to accept opinions instead of actual, determined details and facts, so long as men do not demand as full a statement of facts about *mining* ventures as they demand about *manufacturing* or *mercantile* ventures; and so long as they prefer cheap men and decline to pay reasonable fees, just so long will the bogus mining expert be available for them, and help them with fake enterprises. The general public needs educating that it may put the blame of failure upon the promoter, the director, or the proper person instead of putting it solely upon the mining engineering profession. It further needs to understand what the functions and responsibilities of a mining expert or engineer are, and to realize that success in mining depends not upon luck, nor *solely* upon the engineer, but also upon the sound judgment and honest co-operation of the men chosen for the directorate of the enterprise.

The article from the *Mining Journal* is as follows:

"Some of our contemporaries have recently taken up the subject of reports by mining experts, and are comparing the present value of the shares in various mining companies with the price at which they were issued. This is a subject which falls peculiarly within the province of this journal, and it is one to which we have from time to time called the attention of our readers. As far back as 1894 we published a series of leading articles not only upon the duties of mining experts, but also upon those of every official of a mining company, from the chairman downwards, while every year we publish a return of the principal companies registered in the preceding twelve months, and of the engineer

FOR KING AND EMPIRE.



LIEUTENANT J. EDWARDS LECKIE, D.S.O., M.E.

Late of Strathcona's Horse, who goes out to South Africa again with Canada's  
Third Contingent in defence of the Empire.

upon whose reports the enterprise was commenced. Our contemporary, the *Financial News*, in a preface to its recent articles on the "Mining Expert," very justly remarks that "in fairness to the mining expert it should be added that he is only in a limited sense responsible for the career of the company after its flotation," and in this we heartily agree. Over and over again we have called attention to various mining adventures which have proved unsuccessful, not because the mines were intrinsically valueless, but because the management was left in totally unskilled hands, the direction being entrusted to a board not only ignorant of local conditions, but without even administrative experience. For failures of this class the expert is certainly not responsible. There is, moreover, another class of failure with which he has nothing to do—viz., that which results from manipulation of the shares, causing an inflation above their intrinsic value, and a subsequent but certain depression below it. We are here face to face with a grave danger to mining operations, and one which is constantly bringing them into discredit. The industry which, with the exception of agriculture, is the only one which deals with the production of the raw material upon which the wealth, not only of individuals but of nations depends, has surely enough inherent risks to deal with without the addition of others of a purely speculative and financial nature. There are geological risks, for lodes and mineral deposits are extremely erratic in their occurrence, and call for all the skill and knowledge of the expert: water risks, caused by either too much or too little of that essential element: risks of fire, transport, labour and supplies, and others too numerous to mention, all of which the skilled manager is prepared to encounter, and has been trained to face. But he is not capable, nor should he be expected to struggle with the financial problems caused by operations in Throgmorton Street. From these both he and the expert upon whose report the company was floated should be judged free. Unfortunately, however, the average shareholder displays an almost criminal carelessness as to the disposition of his money. As a rule he speculates for a rise. If this does not come off, then, regardless of the intrinsic value of the property, he is strongly tempted to say unpleasant things with regard to the expert. There is still another point of view which should not be lost sight of. For every property which a skilled and competent expert sees his way to recommend, there are at least a dozen others which he has unhesitatingly condemned. For thus saving the useless expenditure of capital he obtains no credit whatever: indeed it sometimes happens that the disappointed vendors are in a position to do him great damage for having conscientiously performed his duty. It would, therefore, only be fair, although legal consequences might render it impracticable, when preparing a list of the properties with which an expert has allowed his name to be associated, to prepare another of those with which he has not deemed it advisable to be connected, or as regards which he has not advised the expenditure of capital. The position of a mining expert is not a pleasant one. It is one of very great responsibility. If he, in the exercise of professional skill, condemns a property, which is by far his most common experience, he obtains no credit, but is sometimes made to suffer for his truthfulness. If on the other hand, he approves of a property, and the subsequent development be left in incompetent hands, he is again blamed and his reputation ruined if once his name become unfavourably known to the investing public. It is difficult to point out a remedy. Care should be taken to choose a really competent man and to pay him a good fee, which will place him beyond the reach of temptation. We can record an unhesitating conviction that, as a rule, an expert's report is really his honest opinion based upon his knowledge and experience. When his report is received his suggestions should be followed implicitly: should he himself be unable to superintend the subsequent operations great care must be exercised in appointing a competent manager, and also in electing a board which in fact as well as in name is a board of directors. Let them direct and let the manager

manage. If in spite of good direction and skilled management the business is a failure, then, indeed, the views of the expert may be questioned and his opinions challenged, but until the success or failure of a mine as a producer of saleable mineral has been demonstrated, independently of all financial, commercial or administrative interests, it is unjust to lay the whole burden of failure on the shoulders of the "mining expert."

#### The Annual Report of the Centre Star Company.

The REVIEW has received the Third Annual Report of the Directors of the Centre Star Mining Company, Limited, submitted to its shareholders on November 26th. This year the shareholders have not been favored with the opinions of the directorate, which occupied two or three pages of the text of the second annual report, nor have Mr. Wayne Darlington's opinions and boom telegrams been introduced; in fact the distinguished consulting engineer's opinions are conspicuous by their absence.

The report shows that the cost of production has been somewhat, and the cost of development very much, reduced which is greatly to the credit of Manager Kirby. At the same time the text of the General Manager's report does not give shareholders any substantial reason to believe that the value of the property has increased in any degree. In fact, from an examination of the report, it is evident that development work during the last twelve months has failed to reveal any considerable body of payable ore, and it confirms the opinion which the REVIEW expressed last year that the Centre Star Mine is a property of very small present real value.

Development work during the year has opened up the fifth level, which failed to show any ore (on the level) higher than \$9.37 smelters' gross assay value or \$3.37 net value, from which sum the costs of production and maintenance must be met. In a raise from this level we are told there are some fifty feet in length of pay ore assaying \$4.25 smelters' gross value which is about the average of last year. This small body is found in the first fifty feet below the fourth level but it does not run down to the fifth. The work on the sixth level (some 200 to 300 feet) has shown no values as yet, and the seventh level was not started at the time of the annual report. There is, therefore, a very small tonnage of payable ore in sight, which the manager estimates at 4,000 tons of about the same average value as the ore which has been sold during the past year.

For the year ending September 30th there were mined 72,645 tons, at an average cost for mining and development of \$3.53 per ton; nearly 8,000 tons were sold from the dumps, storage, etc., which cost 29 cents per ton for handling, making the total ore shipments for the year 80,419 tons, and reducing thereby the mining cost per ton from \$3.53 to \$3.21. The gross assay value of the ore shipped was \$14.64, the cost of freight and treatment was \$6.00, the cost of production (mine costs included) was \$3.90, the charge per ton necessary to redeem existing indebtedness, was \$2.26, leaving \$2.48 per ton as the margin for profit for the 80,419 tons sold:—

Smelters gross assay value, 80,419 tons.....	\$14.64 per ton.
Cost of freight and treatment per ton...	\$6.00
Cost of production (mine cost \$3.53) per ton .....	3.90
Cost of redemption of debt per ton.....	2.26
	12.16 per ton.
Margin per ton.....	\$2.48

Those who saw our analysis of the second annual report may remember that the REVIEW figured the actual future costs of extraction, shipping and smelting at about \$9.22; the amounts given in this report show that that cost has been pretty closely approximated, as



the actual figures from the report before us show \$9.90. This reduction is very creditable to Manager Kirby, but we regret to say it does not impress the REVIEW any more favorably with the value of the Centre Star stock as an investment. The company had a little over nine months active work during the fiscal year, when its operations were brought to a close by the Rossland strike in the month of July, and production from the entire camp was stopped.

With the small amount of reserves showing, we can not see that there is any special inducement for the LeRoi company to consolidate with the Centre Star and War Eagle. Doubtless an economy for the two latter companies would be effected in the charges for smelting, but the benefits to the shareholders of the LeRoi company are not apparent.

The market quotations for the stock averaged \$1.50 per share twelve months ago, to-day the quotations average 32 cents per share, which figure, in view of the report before us, is certainly high enough.

### The Slump in Copper.

In the October issue of the REVIEW we referred at some length to the decline in the price of copper and the situation very largely brought about by the manipulations of the Amalgamated Copper Company. In view of the continued fall in prices, it will not be out of place to refer again to this subject. The aim of the Amalgamated Copper people was to acquire so commanding a position by means of the acquisition of producing interests, not only in the United States, but elsewhere, as to enable it to control the markets of the world and dictate prices to the trade. M. Secretan had a like fantastic inspiration, though he set out to accomplish his purpose in a different manner, his scheme being to buy up secretly all available supplies, and thus place the market at his mercy. To this end he employed as his chief instrument the Societé des Métaux, and enlisted the support of a great Paris banking institution. He persuaded many of his wealthy acquaintances to join him in buying copper and storing it away, giving them in many cases his personal guarantee against loss in the event of the price falling. In this way he came, directly or indirectly, into possession of the best part of a hundred and eighty thousand tons of the metal, and drove up the price to \$835.00 per ton, in contrast with \$175.00 in 1884. When, in the following year, the inevitable collapse came, he and his group were found to hold about a hundred and sixty thousand tons. The rest of the story—the tremendous break in the price, which went down to \$175.00 per ton, the downfall of the bank which lent its resources in support of this insane gamble, and the bankruptcy of numerous private individuals, is still pretty fresh in the memory of the Paris and London metal exchanges. Our friends across the line, however, work on an altogether different and vaster scale. The Amalgamated Company was not satisfied with merely purchasing the metal from producers; it aspired to get control of the production itself by consolidating the mines in a great trust. Beginning with a capital of seventy-five million dollars, in shares of a hundred dollars each, which were issued in May, 1899, at par, in June of the current year the proprietary passed a resolution for increasing it to a hundred and fifty-five millions in order to acquire the Boston and Montana and the Butte and Montana undertakings at the price of five and a third Amalgamated shares for each one of the former company's shares, and the same number of shares of the Amalgamated for one and a third of the Butte and Montana Company. The value of the properties to be acquired for eighty million dollars was estimated by one leading firm of experts, engaged for the purpose, at seventy-five million dollars and by another at eighty-five million dollars. A discrepancy of ten million dollars was, however, a mere bagatelle, especially as, in anticipation of the "deal," the shares of the two com-

panies whose interests were to be acquired were raised to a point putting on them a market valuation of ninety million dollars, whereby it was made to appear that the Amalgamated people were "getting in" cheaply. But the measure of the latter's ambition was not yet by any means full. Other important producing interests were approached. It was greatly desired to capture the Calumet and Hecla, which had an annual production of upwards of ninety thousand tons, or about one-fourth of the entire output of the whole of the Butte district. But it failed in its efforts in this direction. At the time of the foregoing increase in the capital various interests outside the combine, representing an annual output of about forty million pounds of copper per annum, got together and under the lead of the Heinzes, who controlled the Montana Ore Purchasing Company, incorporated themselves as the United Copper Company with a capital of eighty million dollars, the object being to fight the Amalgamated Company.

The latter was stated, as far back as July last, to have been compelled to accumulate a stock of as much as a hundred and thirty-five million pounds of copper, after deducting all future sales, in order to enable it to support the market. This represented about 22 per cent. of the total output of all the mines in the United States, and it is believed that at a quite recent date it had increased its holding to upwards of a hundred and eighty million pounds, the addition being at the average rate of more than twenty million pounds per month. If this process were continued to the end of the year the company would have on its hands a very formidable proportion of the whole output for the twelve months. It is, however, said that the company has been secretly selling considerable amounts. The statement that it had disposed of a large quantity at 14 cents per lb. emanated from what is regarded as a tainted source, yet it would appear that confirmatory evidence has been forthcoming. If the fact of these sales were established beyond all possibility of doubt, it would cause no surprise in the trade, which has for many weeks past been plied with stories from several different and independent quarters that the company had wearied of its efforts to sustain the market, that it had accumulated a much larger stock of the metal than was found convenient, and that it recognized that the more it piled up the more it would have to accumulate. Another and widely credited story attributed to it an intention to "break" its price—17 cents per lb.—for electrolytic copper in order to bring about a collapse in the market quotation of the shares of those American and European producing companies which refused to throw in their lot with it. By this means, it was suggested, the combine would be able to purchase those shares on so extensive a scale as to give it a controlling interest. Several weeks ago it was publicly stated that overtures were understood to have been made to the Rio Tinto Company in order to induce it to come to some arrangement for restricting its output, and that the directors of the latter turned a deaf ear to the scheme. The Rio Tinto Board is composed of gentlemen whose policy is eminently conservative, and probably nobody in the world except the engineers of American trusts would have run the risk of encountering the rebuff that was certain to await them. It is possible that the Amalgamated Copper people are still hoping against hope that by bringing pressure to bear they may still succeed in inducing that important company to enter their fold, and that this object is being sought through the medium of a raid on the shares, aided by a collapse in the price of copper. It is also not unlikely that the breakdown in the latter has merely been effected for the purpose of enabling the people who run the combine to load themselves up with cheap shares, and that when they have acquired as many as they want they will once more proceed to lift the price of the metal and "corner" the "bears," of whom there must be many in existence; or, again, it may be that their one purpose is to compel outside producers in the United States to reduce their output. But all this and a good deal else in the



same connection is the merest speculation. Nobody not in the secrets of the inner ring can know to a certainty what is going on, the only known fact being that the copper market has been thrown into a state of utter demoralisation by these American manipulations.

If affairs in the immediate future depended upon legitimate supply and demand the problem would not be a particularly difficult one to solve. Unfortunately it contains too many unknown factors. Even as regards so seemingly simple a question as that of consumption the best recognized authorities are unable to agree among themselves. On the one hand we are assured that, so far as Europe is concerned, it is increasing, and, on the other, that it is diminishing. To decide between the two is impossible. Yet from all the known facts bearing upon the industrial situation, the weight of evidence would appear to be greatly on the side of those who maintain that consumption is falling off. One has only to consider for a moment the immense check that has been applied to enterprise, especially in the electrical industry, in Germany, France, and Belgium, to be driven to the conclusion that less copper is being used now than either in 1899 or last year; yet we are told that deliveries are once more overtaking supplies, and stocks diminishing. The same has been said in regard to the position in the United States. Last year's output was about 268,000 tons out of a total production for the whole world of 486,000 tons. Ten years ago the world's production was only equal to that of the United States alone at the present time. It has been estimated that for the ten months to the end of October last the United States produced a little over 223,000 tons, or about the same amount as in the corresponding period of 1900. In the same interval it imported 50,000 tons, and started the year with a stock of 40,000 tons, making the aggregate supplies 314,000 tons. From this has to be deducted 68,000 tons exported, and an estimated home consumption of 138,000 tons, the nett result being that at the close of October there seemed to be a stock amounting to 108,000 tons. The several foregoing estimates are susceptible of considerable variations. Authorities disagree, but a fair average among the majority of them brings out the fact that the actual stock can hardly be less than 90,000 tons, the bulk of which is, or rather was, in the hands of the Amalgamated Copper Company a month ago, which, at the then price of the metal, represented a value of probably over five millions sterling. To carry that bulk of copper is no serious task for so powerfully backed an interest. But the question is not one that concerns its financial strength. Europe is finding much of its supplies in other quarters than the United States, and while production keeps up and consumption is on the wane the combine, in order to keep up prices, would have to meet this position by reducing its own production, or going on buying, or both, the only alternative being to throw up the sponge and permit prices to sink to a normal trade level. Most business men will no doubt be of opinion that the game of artificially keeping up the market must be about played out.

#### A Bounty Wanted for Arsenic Refining.

Readers of the REVIEW are aware that the problem of extracting the arsenic from the auriferous mispickel ores of Hastings County, Ont., has been successfully solved by the Canadian Gold Fields, Limited, an English company operating at Deloro. During 1900 this company produced 606,000 lbs. of arsenic of an estimated value of \$22,725 and for the first nine months of this year 975,054 lbs. of a value of \$30,432. The plant and process employed by this company were fully described in these columns in our issue of March last. With a view to promoting the further development of this important young industry, the mine owners and residents of Hastings County have petitioned the Dominion and Ontario Governments for a bounty, the

claims for which are fully set out in the following letter addressed to the Hon. the Minister of Finance by the Secretary of the Committee:—

"On behalf of the residents of this district who are asking to have Arsenic placed on the bounty list, and in compliance with your request, I herewith submit to your notice a few facts concerning the production of refined Arsenic in Canada, the market there is for it on this continent, and the condition of the Arsenic trade in England and in Europe.

The published information on Arsenic throughout the world is meagre. In the Library of Parliament at Ottawa there are only two items, one relating to a new lode of arsenical pyrites at Bastia, France, and one from Liege, Belgium, so what data I have been able to get together, is from information from other sources.

The principal source of the world's supply of white Arsenic has been Devon and Cornwall, and while the industry in England is declining (see *London Engineering* copied in *Kingston News* September 11th and *Montreal Star* August 31st) the old land yet holds the control of the Arsenic trade.

The Arsenic produced in England is obtained as a bi-product from the tin and copper ores and from what is locally called mundic ore; as long as England's mines produce tin and copper they will also produce Arsenic; but mining in Cornwall now is made very costly by reason of the great depths and size of the workings, and the enormous volume of water that must be pumped, hence it becomes very difficult for mines so situated to compete successfully with less expensive locations. To this fact is largely due the possibility of Canada becoming an Arsenic producer.

Europe produces Arsenic in large quantities, but the exact output for any one year I have not been able to ascertain. In the report from Liege before referred to, it will be seen that the exports to U. S. for latter half of that year (1898) were \$29,225. Germany produces and exports Arsenic. Portugal produces and exports Arsenic; one firm there has now in stock 1,500 tons, holding it for a higher price, and I understand that but a small percentage of their total area of arsenical deposits are as yet developed. Spain also contains ore from which has been extracted Arsenic and Silver; steps are now being taken to re-open an important mine of silver and Arsenic in Spain. I presume the conditions that warrant us here in seeking to establish the Arsenic industry in Canada, warrants the man in Spain in seeking the same object. Italy and Hungary also produce Arsenic.

From 1890 to 1901 Arsenic has varied in price from £12 to £23 per ton of 2,240 lbs. At present the price is low being quoted in New York at 3 cents per lb. and by reason of heavy stocks being held (one firm in Cornwall is holding 3,000 tons) the price is likely to remain low for several months, perhaps a year.

I may say that my informant tells me that both the stock of 3,000 tons in Cornwall and the 1,500 tons in Portugal are being held for a higher price than that now prevailing, and it is very possible that both these firms require a higher price in order to make a profit. It would be folly for us to seek to establish Arsenic production in Canada unless conditions were such that we could, when developed and when works of sufficient capacity were in operation, produce Arsenic of the very highest quality at a less cost per ton than anywhere else in the world, and I hope to show you that these necessary conditions do prevail in Canada.

What is now desired is that the Arsenic required in both the United States and Canada be supplied by Canada. We are in a better position to supply this trade than England or Europe can be, and it is the American trade we now figure on.

Under date of June 17, 1901 I am advised by Department of State, Washington, D.C. that in 1900 there were imported into U. S. 7,047,353 lbs. Arsenic, value \$333,153. For year 1899, 10,539,439 lbs., value \$415,066. In 1899 there were imported into the U. S. and Canada 5,567 tons of Arsenic. Canada during four years ending 1898 imported 2,224,783 lbs. valued at \$82,103. Since 1899 the Canadian imports would not show Canada's consumption, for some users have bought Arsenic direct from Canadian Goldfields, Limited, Deloro, Ontario.

*Arsenic* is duty free everywhere.

The present capacity of the only Arsenic works in America is

1,000 tons per annum located at Deloro, Hastings County, Ontario, 160 to 180 men employed; monthly pay roll \$7,000, besides outlay for wood, timber, etc.

The reason why we consider the U. S. market as tributary to Canada is that up to date no Arsenic has been produced commercially in the U. S. (See letter in *The Engineering and Mining Journal*, N.Y. July 6, 1901).

A deposit of mispickel and of realgar, both capable of producing Arsenic have lately been discovered in the State of Washington, but if Canada produces Arsenic in quantity they are not likely to embark in the business in Washington for the good reason that the conditions prevailing are very different to those in Hastings, nor is their mispickel equal to ours as an Arsenic producer—theirs contains both zinc blend and lead, either of which are difficulties in Arsenic production.

To increase the output of Arsenic in Canada from 1,000 tons to 5,000 tons per annum means the erection of four such plants as that now in operation at Deloro, and an outlay of fully \$600,000 in plant alone, and at least an equal amount would be required in order to pay for mispickel properties on which to work. It may be said that the actual *cash* investment to be made in Canada in order to produce 5,000 tons of Arsenic yearly would be fully \$1,500,000.

It would be very foolish on our part for us to seek to interest capital to this extent if we were not confident that we have the ore bodies on which such an amount could be invested with safety, but we have the ore, the labor, the water-powers, the fuel for many years, the railroads, the climate, the supplies of all kinds at lowest cost,—all we want is capital directed by skilled men in order to make this district prosperous.

A pay-roll of \$400,000 per annum will be the result of this effort if successful.

To produce a ton of refined Arsenic means the consumption of one ton of coke for refining purposes alone.

To produce 5,000 tons of Arsenic per annum in this district means 12,000 tons of freight per annum, most of it long haul, and much, high class.

The quality of Hastings' Arsenic is very high (See Prof. DeKalb's report *Canadian Mining Review* July 31, 1901).

The manufacture of casks in which to pack the Arsenic would, with an output of 5,000 tons per annum, be of itself an important industry, and would provide a paying market for elm timber now of little use. This district contains large quantities of this wood.

The desire to make Canada something more than "a hewer of wood and drawer of water" for other countries, can be assisted by Arsenic production.

The refined Arsenic produced in Canada and placed upon the market by the Deloro Company is the purest, and is now recognized by the trade as such. This was not always known to be the case, a very strong prejudice had to be overcome, and Deloro Arsenic was for a time sold in New York as English; now it is sold for what it really is, viz. Canadian Arsenic.

The consumption of Arsenic in America needs to be cultivated and it is the intention of men who are giving this business serious consideration to do so if they take it up, both in the line of agricultural chemistry and for manufacturers. This experimental work will cost a lot of money but will result in larger trade for our country if successful, and if not, will have cost the public nothing.

The fact that Arsenic is being, and can be produced in Canada, at less cost per ton than it can be anywhere else, is no miracle; it is made possible by reason of the gold contents in the ore from which the Arsenic is eliminated. This gold value is won and goes towards paying the costs of mining and treating, but unless the Arsenic is won also, the gold contents of the Hastings mispickel would not alone pay; our mispickel mines are Arsenic mines, not gold mines. The treatment of Hastings mispickel is an industrial, as well as a mining proposition in the true meaning of that term.

The gold contents of our mispickel, combined with our first class labor in plenty, our water-powers, and all other facilities required for the economical working of our large bodies of low grade ores, makes a fact of the assertion that Canada will be able to produce a ton of Arsenic, at a lower cost than it could be produced elsewhere if the required capital can be interested.

The same regarding pig iron could with truth have been said of Sydney, but saying it truthfully is not doing it. The capital and bounty combined with natural facilities made it possible for Sydney to produce a ton of pig iron cheaper than it can be done for anywhere else, and bounty combined with natural facilities and capital may be expected to have a like result on Arsenic in Hastings. It will be noted that the only arsenical ores referred to as gold bearing are our Hastings mispickel; Canada is unique in this respect, and it constitutes an element of strength for this business here.

You will also note the large number of men employed in works producing three tons refined Arsenic per day.

A bounty on Arsenical ore is asked for from the Dominion Government and the Ontario Government to run for a term of years and gradually decrease until the bounty is extinguished, time being given in which to erect works before bounty term commences.

I remain, dear Sir,

Your obedient servant,

JOSEPH JAMES,

Hon. Secretary of Committee.

**A Record Year in Canadian Asbestos.**

A year ago we pointed out that 1901 would be the banner year in the history of asbestos mining in Canada, and the unparalleled activity which has prevailed at the mines, the acquisition of new producers, the erection of costly milling plants, together with a greatly increased output and a considerable advance in prices have more than justified our prediction.

Complete figures for the year are of course not yet available, but by going carefully over the monthly statements of the Department of Customs we have been able to compile an interesting return of the exports from the first of the year to the end of October. These figures, which, by the way, we may say, are likely to be under, rather than over, estimated, show that the exports for the present year will be over the million dollar mark. This Quebec industry has always been highly profitable, but never more so than in 1901.

1901.	NO. I GRADE.		NO. II GRADE.		NO. III GRADE.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
January .....	40	\$4,000	84	\$4,700	1,197	\$23,085
February .....	26	2,605	280	12,600	915	17,956
March .....	352	13,250	104	5,450	1,044	24,962
April .....	86	8,625	186	10,580	1,251	31,465
May .....	1,895	43,084	141	8,683	1,683	41,796
June .....	616	54,069	414	18,989	1,816	44,280
July .....	361	46,875	204	11,329	1,380	35,808
August .....	431	56,185	351	11,850	2,377	53,585
September .....	418	52,605	171	9,080	2,217	46,473
October .....	203	21,728	118	5,765	4,198	108,987
Total .....	4,428	303,026	2,053	99,026	18,108	428,397

The following returns, compiled from the same source, shows the monthly distribution of these exports:—

1901.	NO. I		NO. II		NO. III		ALL GRADES	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
January—		\$		\$		\$		\$
To Great Britain ..	20	2000	57	3200	364	6975		
" United States ..	20	2000	27	1500	780	15585		
" Germany .....								
" Other countries ..					53	525		
Total .....	40	4000	84	4700	1197	23085	1321	31785
Carried forward ..							1321	31785

## MONTHLY DISTRIBUTION OF ASBESTOS SALES—Continued.

1901.	No. I		No. II		No. III		ALL GRADES	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
<i>Brought forward.</i>		\$		\$		\$	1321	31785
<b>February—</b>								
To Great Britain..					249	4980		
" United States..	26	2600	280	12600	629	12436		
" Germany.....					17	340		
" Other countries		5			20	200		
Total.....	26	2605	280	12600	915	17956	1221	33161
<b>March—</b>								
To Great Britain..			30	1750	205	4925		
" United States..	352	13245	62	3100	712	18147		
" Germany.....			12	600	62	11240		
" Other countries		5			65	650		
Total.....	352	13250	104	8450	1044	24952	1500	43662
<b>April—</b>								
To Great Britain..			57	3130	30	450		
" United States..	86	8625	110	6290	989	26421		
" Germany.....			18	1080				
" Other countries			1	80	232	4594		
Total.....	86	8625	186	10580	1251	31465	1523	50670
<b>May—</b>								
To Great Britain..	50	4800			135	3925		
" United States..	1700	12084	141	8683	1548	37871		
" Germany.....								
" Other countries	165	26200						
Total.....	1895	43084	141	8683	1683	41796	3719	93563
<b>June—</b>								
To Great Britain..	15	2400	65	4275	270	4754		
" United States..	230	22405	87	5835	1449	36418		
" Germany.....	15	2520	145	4109	75	1498		
" Other countries	356	26744	117	4770	52	1610		
Total.....	616	54069	414	18989	1846	44280	2876	117338
<b>July—</b>								
To Great Britain..	91	13825	50	2500	46	1054		
" United States..	65	8550	2	144	943	23649		
" Germany.....	50	8100	102	7686	391	11105		
" Other countries	155	16400	50	999				
Total.....	361	46875	204	11329	1380	35808	1945	94012
<b>August—</b>								
To Great Britain..	85	13671	5	625	115	1825		
" United States..	135	23884	196	8225	2182	50898		
" Germany.....	86	7280	150	3000	80	862		
" Other countries	125	11350						
Total.....	431	56185	351	11850	2377	53585	3159	121620
<b>September—</b>								
To Great Britain..	95	13900	131	6580	651	12564		
" United States..	95	13160			1516	32408		
" Germany.....	73	11745	20	1000	50	1501		
" Other countries	155	13600	20	1500				
Total.....	418	52605	171	9080	2217	46473	2806	108158
<b>October—</b>								
To Great Britain..	23	3330	90	4125	142	3275		
" United States..	155	15998	20	1000	3284	87131		
" Germany.....	25	2400			552	15366		
" Other countries			8	640	212	3215		
Total.....	203	21728	118	5765	4190	108987	4511	136480
Total exports of Canadian Asbestos, to 31st October.....								830449

## OUR ILLUSTRATIONS.

## Lieutenant Jack Leckie, D.S.O., M.E.

As everybody knows, Canada is again giving tangible evidence of its very pronounced fealty to the British flag by the despatch of another contingent of mounted troops to aid the Mother Country and our glorious Empire in rounding up the guerilla Boer. To this last, as it did to all the other contingents we sent out, infantry, artillery and mounted troops, the mining profession yields its quota of officers and men.

Major Hamilton Merritt of Toronto, who goes out to South Africa as second in command of this very fine body of men, has been in practice as a mining engineer for many years, having served on the Royal Commission appointed by the Ontario Government to make a report upon the mineral wealth of Ontario, and, for a year or two after its inauguration, as lecturer in mining engineering at the Kingston School of Mines. Major Merritt went out to South Africa shortly after the war broke out, doing good service in the field as an officer of Brabant's Horse.

A Commission has been given to another old friend, Captain Bruce Carruthers, one of the Governors of the Kingston School of Mining. When the call to arms came, Carruthers, who is a gentleman of means and who had held a Commission in a British cavalry regiment, applied unsuccessfully for a Commission in the first Canadian contingent. He was, however, determined upon seeing service and, rather than be left behind, he went out to South Africa as a private and returned with the regiment a non-commissioned officer.

The officer, however, who is most widely known to the mining profession in Canada is Jack Leckie, the youngest son of that veteran in Canadian mining enterprise, Major Robert G. Leckie. Lieutenant J. Edwards Leckie, after graduating at our Royal Military College, spent several years down in Nova Scotia in charge of the Torbrook iron mines, after which he went out to British Columbia and established a consulting practice with the firm of Leckie & Harris at Greenwood. When Lord Strathcona raised his splendid regiment of mounted infantry, Jack Leckie was given a commission as lieutenant, and for conspicuous gallantry in the field was awarded the D. S. O. He had also the distinguished honor of receiving from the hands of the King the colors presented to the regiment on its return from active service.

The REVIEW, we are sure, voices the sentiments of every one of its readers when it heartily wishes these gallant fellows, Merritt, Leckie, and Bruce Carruthers, a pleasant voyage, the best of good luck, and a safe return to the land of the maple.

## Our Iron Industries in Ontario.

One of the outstanding features of the year just closed has been the steady development of our iron mining and smelting industries in Ontario, Quebec and Nova Scotia. The following returns of the exports of iron ore and pig iron for the ten months ended October last speak for themselves of the progress being made in these industries:—

1901.	IRON ORE.		PIG IRON.	
	Tons.	Value.	Tons.	Value.
January.....	551	\$1,096	146	\$3,708
February.....	348	1,829	111	3,076
March.....	628	14,906	82	1,716
April.....	342	546	975	18,800
May.....	4,294	10,759	169	4,113
June.....	48,703	121,913	1,471	22,084
July.....	26,338	65,627	2,775	48,050
August.....	56,315	142,084	5,119	59,884
September.....	61,844	152,179	3,301	43,604
October.....	6,038	14,608	15,175	131,395
Total.....	205,401	\$525,547	29,324	\$336,430

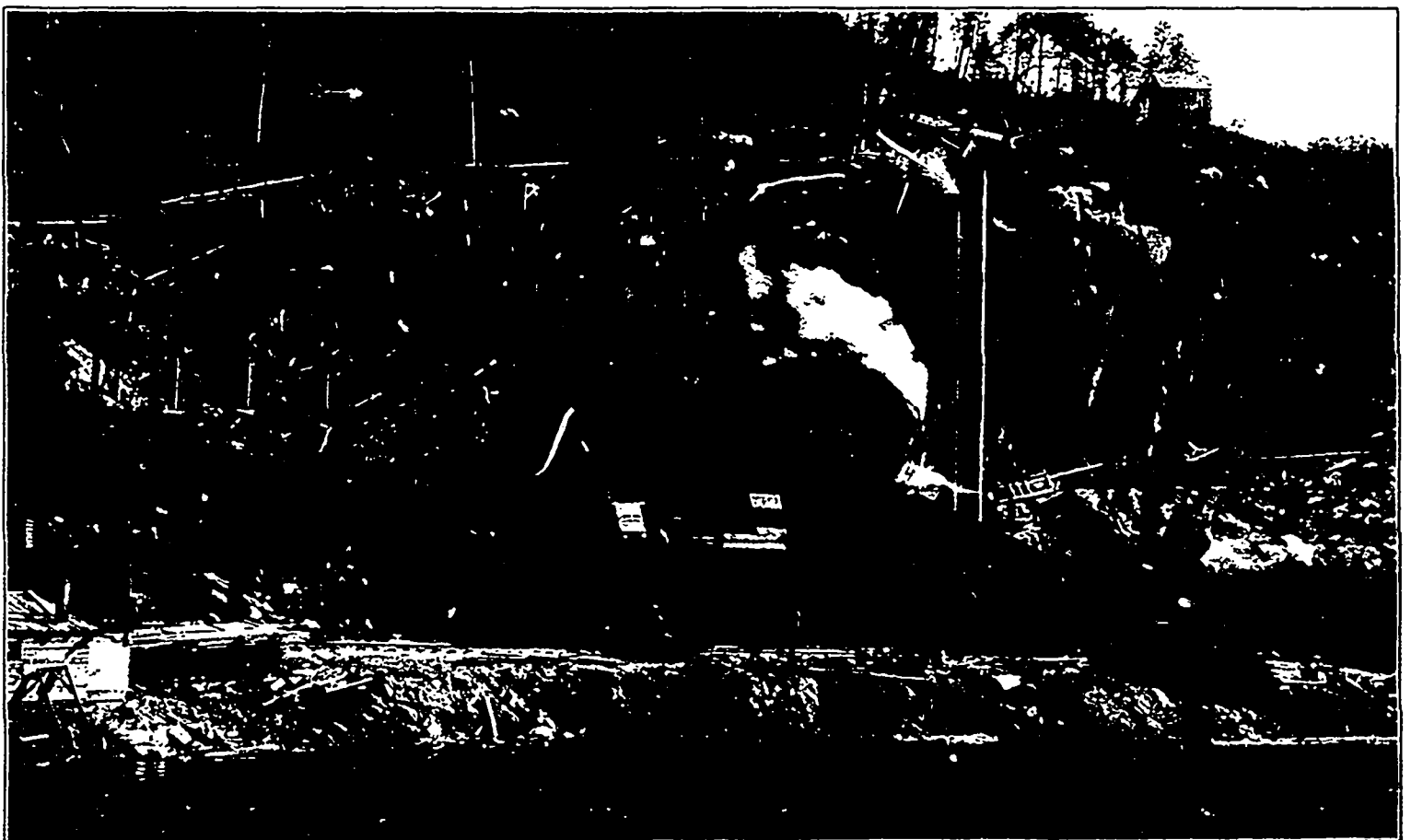
**Anglo-Canadian Gold Estates.**—It has been decided to postpone the installation of a stamp-mill at the Elizabeth mine, Lake of the Woods, for six months, during which time underground work will be pushed on so that there may be an unfailling supply of ore to draw upon when the crushing machinery is in. The site is practically ready for the mill, so that, at any time that it is thought advisable, the machinery can be put in.

**Electric Drills at the Payne.**—Mr. A. C. Garde, manager of the Payne mine, Slocan District, B.C., reports the installation of three electric drills which are giving entire satisfaction.

IRON MINING IN ONTARIO.



Helen Iron Mine, Second Bench ; August 1900.

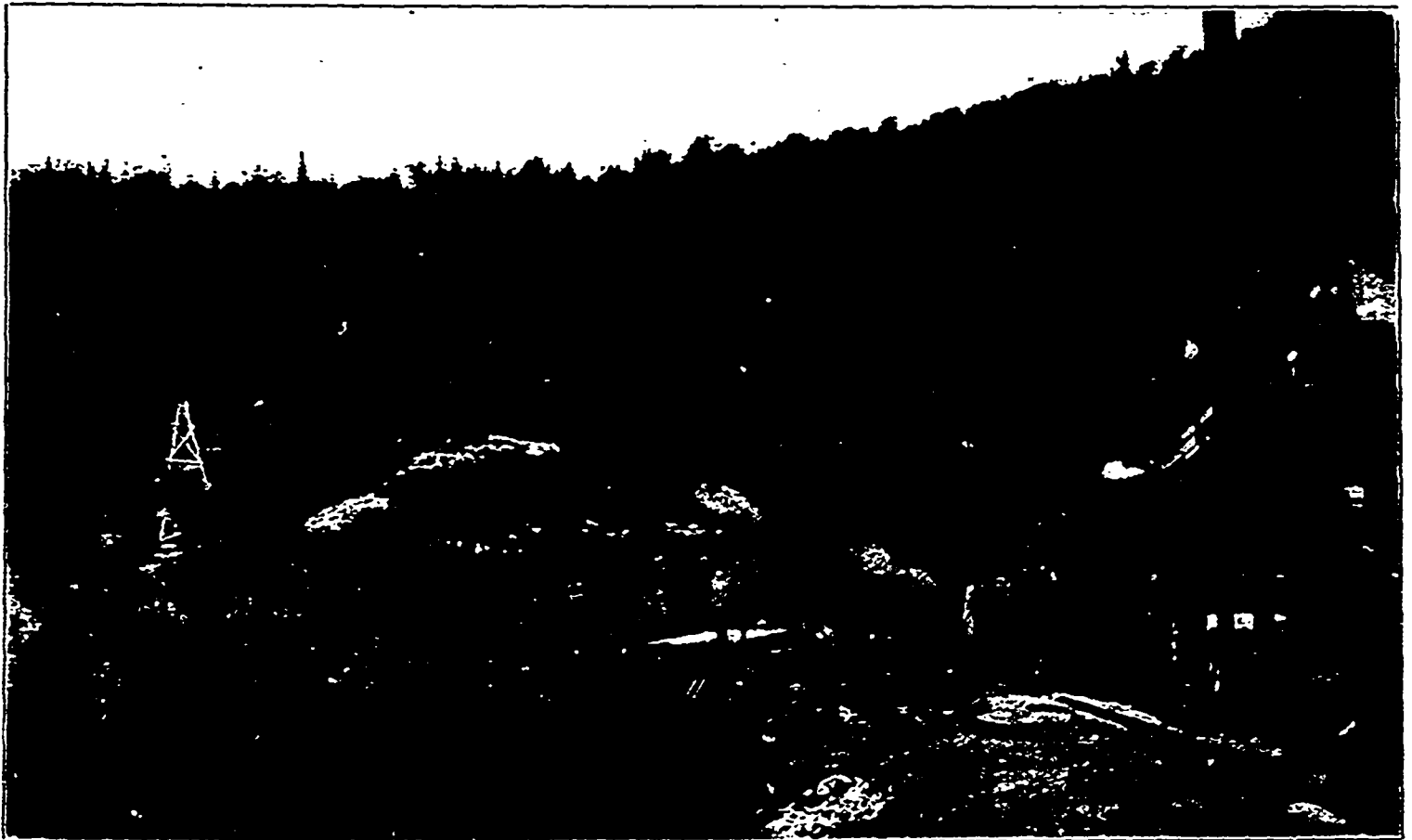


Helen Iron Mine : Plant for Crushing Ore.

IRON MINING IN ONTARIO.



Temporary Ore Dock of Lake Superior Power Company, Michipicoton Harbor.

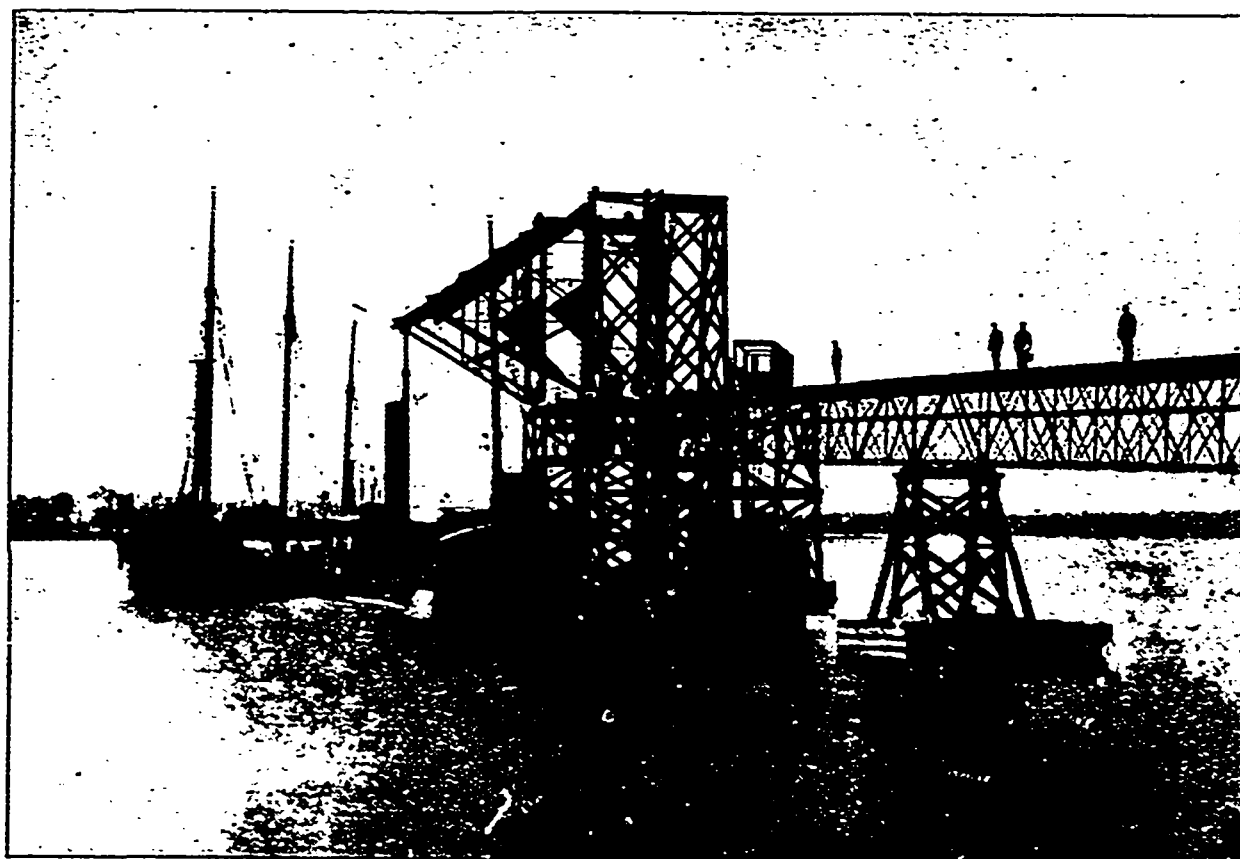


Helen Iron Mine: General View, August 1900.

IRON MINING IN ONTARIO.



Charcoal Iron Plant of the Deseronto Iron Co. at Deseronto, Ontario.



Unloading Iron Ore at Pier of the Deseronto Iron Co.

IRON MINING IN ONTARIO.

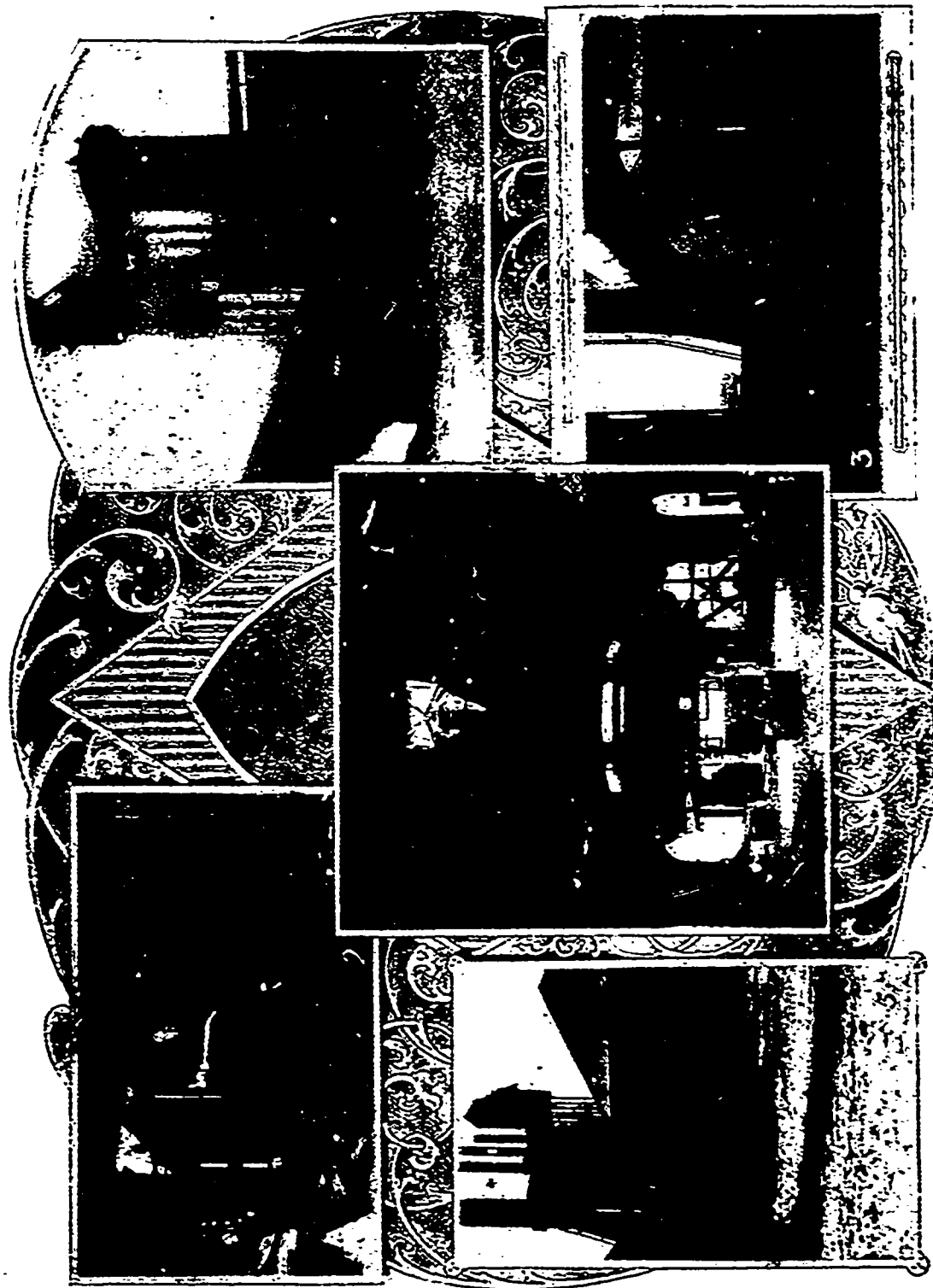


Blast Furnace Steel Works of the Hamilton Steel & Iron Co., at Hamilton, Ont.



Rolling Mills and Forge of the Hamilton Steel & Iron Co., Hamilton, Ont.

IRON MINING IN ONTARIO.

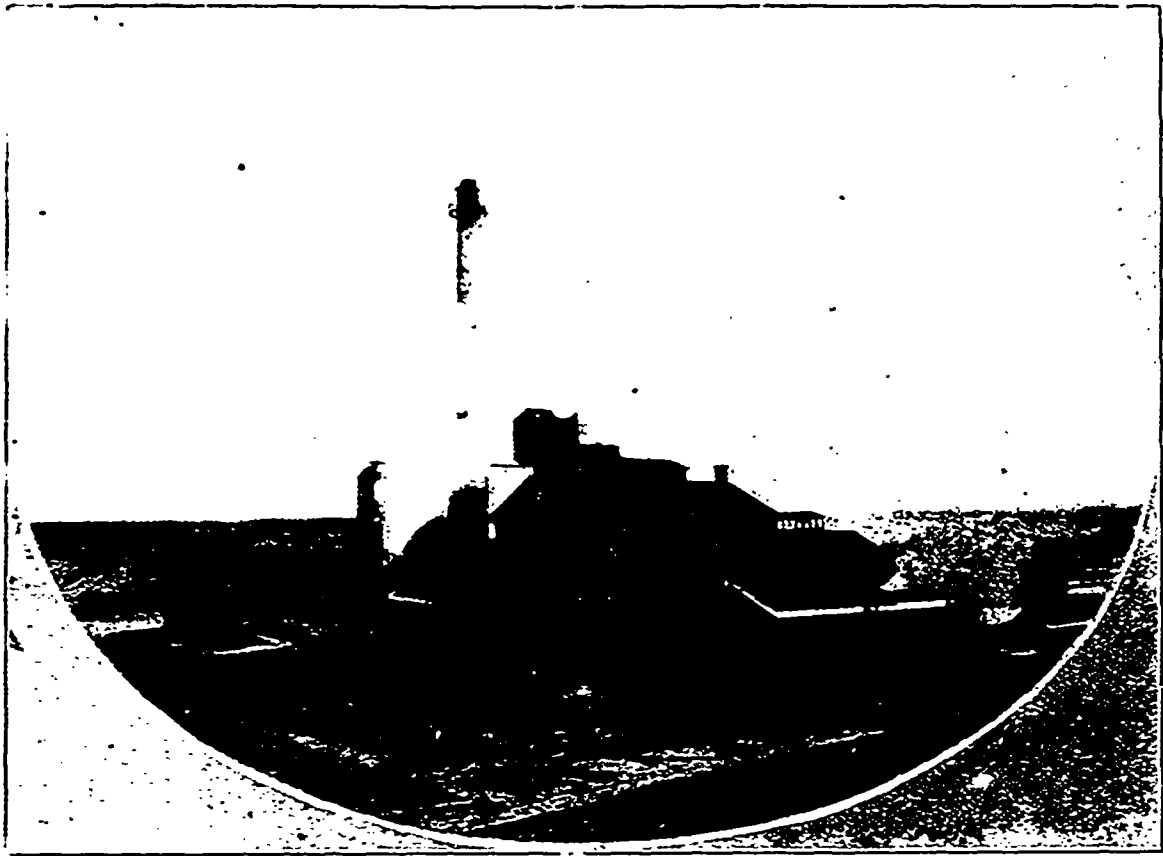


INTERIOR OF FURNACE PLANT, HAMILTON STEEL & IRON CO.

- 1.—Interior of Cast House and Front of Furnace.
- 2.—Showing Gas Connections to bottom of Stoves and Hot Blast Main.
- 3.—Base of Draft Stack with Sixty inch Waste Gas Main from Rollers.
- 4.—Cast Hot, Furnace, Stoves, Hot Blast Tower, Hot Blast Engine House, and portion of Stack House.
- 5.—Rear end of Stack House and Stoves; shows Cold Blast connections on top of Stoves.



IRON MINING IN ONTARIO.



Furnace Plant of the Canada Iron Furnace Co. at Midland, Ont.



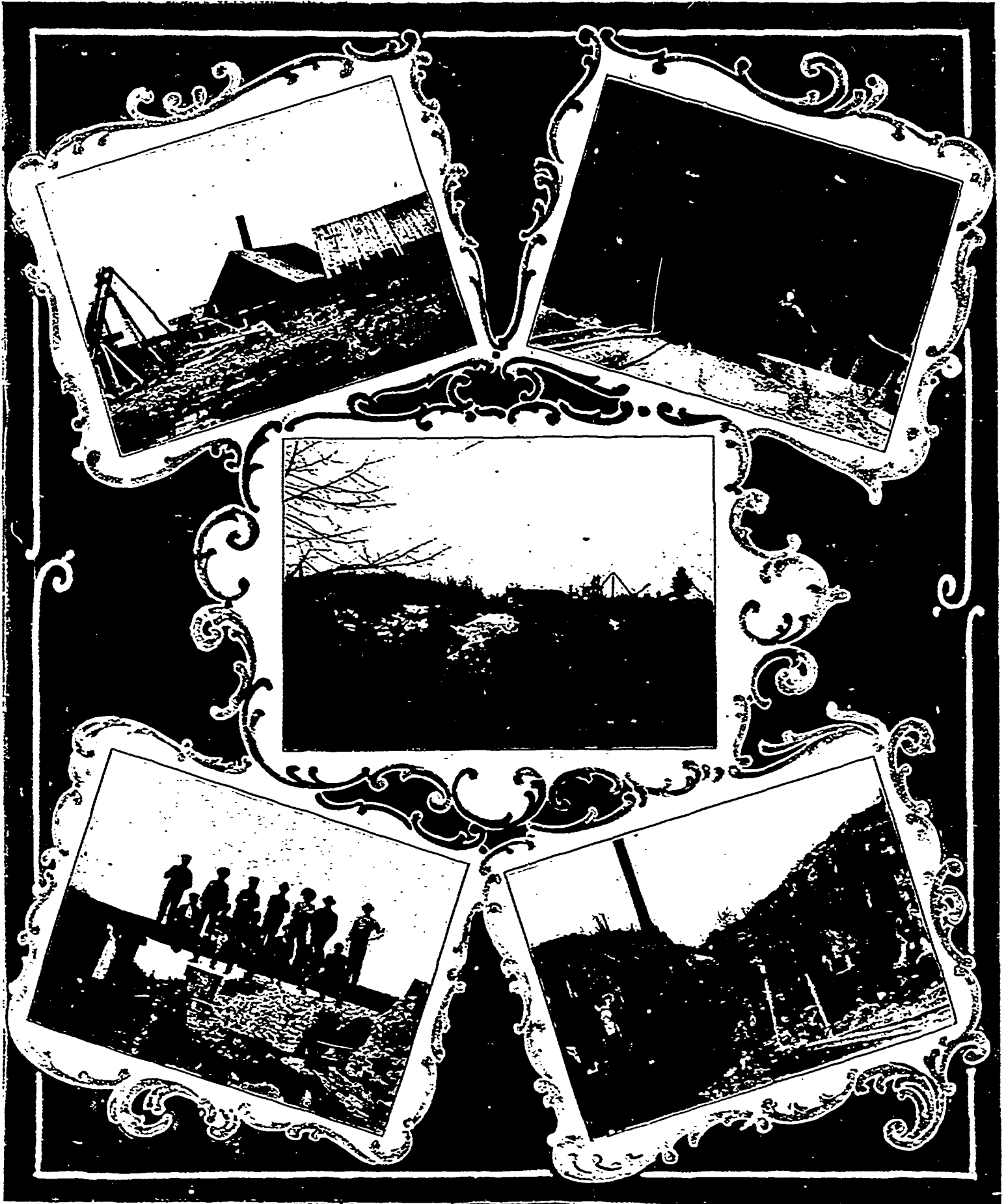
Showing portion of Cast House, Down Take, Dust Catcher, Stoves,  
Gas Main to Boilers and Cold Blast Main.



One of the Blowing Engines.

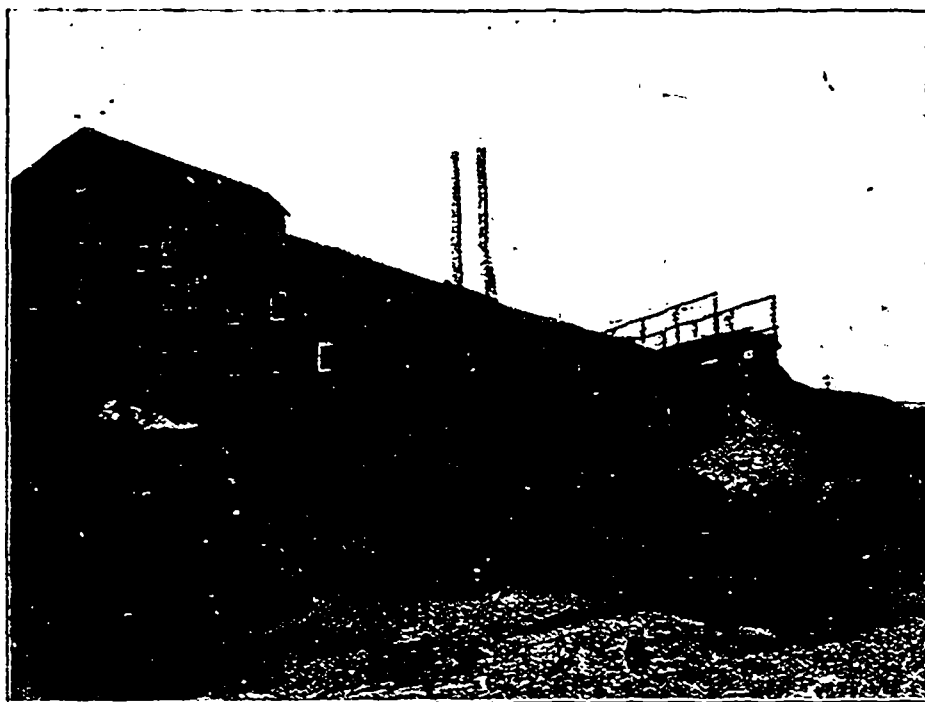
Hamilton Steel & Iron Co., at Hamilton, Ontario.

IRON MINING IN ONTARIO.



Iron Mining in Eastern Ontario. Showing the Calabogie, Wilbur, and Robertsville Mines. The centre photo is of the Stoness-Kent Mica Mine.

GOLD MINING IN ONTARIO.



Belmont Gold Mine : Mill (30 stamps) from southwest. Operated by the Cordova Exploration Company.



Interior 30 Stamp Battery at Belmont Gold Mine, Hastings Co., Ontario.

While, naturally, the bulk of this activity must be credited to the older established industries of Nova Scotia, whose exports of pig iron and steel to Great Britain and to Europe will, henceforward, be a conspicuous feature of our industrial progress, the iron mines and furnaces of Ontario have also to record a banner year. In 1900 the output of pig iron was 62,386 tons, worth \$936,066, while in the nine months of 1901 it rose to 87,888 tons valued at \$1,296,344. In December a year ago the Midland furnace of the Canada Iron Furnace Company went into blast and has been steadily producing ever since, thus adding materially to the iron making capacity of the province. The Midland furnace, as well as that of the Hamilton Steel & Iron Company, turns out coke iron, while the Deseronto Iron Company is running on charcoal iron alone. The views of the Helen Iron Mine operated by the Clergue Syndicate have been kindly furnished to the REVIEW by the courtesy of the Director of Mines.

Commenting upon the prospects for iron making in Ontario, the Director of Mines in his report for 1901 says:—

"It is pertinent to ask whether these advantages are confined to the United States. Is it practicable for the Province of Ontario, for example, to enter upon the business of making iron and steel on anything like terms of even competition with the republic to the south of us? Even if her undoubtedly large stores of iron ore and abundant deposits of limestone furnish two of the three kinds of raw material essential to the business, will not her coalless formations and distance from the seaboard heavily handicap Ontario in the struggle to supply the world's markets? These are questions which can only be answered by actual experiment, not by balancing conditions on paper. Nevertheless, there are many features which render the prospect before the developing iron industry of Ontario a promising one. To begin with, the home market is large and steadily increasing. The Province of Ontario with its mills, foundries, factories and railways, is a heavy consumer of pig iron. The career of industrial expansion upon which it has embarked must increase that consumption by leaps and bounds, and apart altogether from government assistance by bounties or tariffs, the home producer will necessarily enjoy the advantage conferred by proximity to his customers. There is now no doubt of the quantity and quality of Ontario iron ores, which are found in the western, central and eastern parts of the Province, and of fluxing materials there is no lack.

The prime test of the suitability of any locality for the iron smelting business is the cost of assembling the necessary raw materials, namely, iron, ore, limestone and coke. In an address delivered at Toronto under the auspices of the board of trade on 15th February last, Mr. A. J. Moxham, general manager of the Dominion Iron and Steel Company of Sydney, C.B., enumerated four points in Canada where the actual cost of assemblage compared favorably with that at Pittsburgh, Pennsylvania, the greatest seat of the ironmaking industry in the United States. Of these, two were in Ontario, on the shores of lake Superior and in the eastern portion of the Province respectively. The others being in British Columbia and at Sydney. According to Mr. Moxham, the "actual freight cost" of assembling the raw materials at Pittsburgh amounts to \$3.25 per ton of pig iron made: while at the iron mines on the Ontario shore of lake Superior the cost is given at \$1.97 per ton only "or \$1.28 lower than the Pittsburgh standard." Apparently in the latter case the cost of transporting the coal only is reckoned, nothing being allowed for either ore or limestone, which gives the comparison an air of being incomplete. As to eastern Ontario, Mr. Moxham states that here "exists ore of great promise, within reasonable distance of the coal of either the Connellsville or Punxsutawney districts. Independently of the local supply is the Canadian lake ore to draw from. This and the coal can be assembled within the Pittsburgh margin. At Sydney of course the freight charges are much below those at Pittsburgh, being indeed only 79½ cents per

ton of pig iron, "the lowest assemblage cost in the world for the tonnage under consideration." On the question of steel production for foreign markets the general manager of the Dominion Iron and Steel Company makes out a still stronger case for Sydney when he says that, allowing one and a tenth tons of pig iron to a ton of steel the freight cost of assembling the raw materials for the latter at Pittsburgh is \$3.57, to which must be added \$2 per ton for delivery at tidewater, making \$5.57 in all, while at Sydney the pig iron being already on the seaboard the freight cost of a ton of steel is only a few cents more than that of a ton of pig iron. If these figures be correct, the superiority of Sydney as a steel producing point is sufficiently manifest, and a power has arisen on the Canadian shore of the Atlantic ocean which must inevitably exercise a great, if not a dominating influence, in the iron and steel trade of the world. Exports of pig iron from Sydney to Great Britain have already begun.

It is to be noted that when Mr. Moxham speaks of the "freight cost" he is careful to point out that he means the "actual cost" of haulage to the railway and steamship companies, not the rates charged by them for their services. In all cases the latter must be in excess of the former, and in most cases they are very considerably in excess. This is quite evident when the cost of transporting ore from an upper lake port to a lower lake port, a distance of say 1,000 miles, is given as 50 cents per ton, and the average cost of railway freight at four-tenths of a cent per ton per mile; actual facts being that contracts are now being made for the season of 1901 to carry ore from Duluth to Cleveland for 80 cents per ton, and the rate on iron ore from Eldorado in Hastings County to Hamilton, a distance of 170 or 180 miles at the present time is \$1.10 per ton.

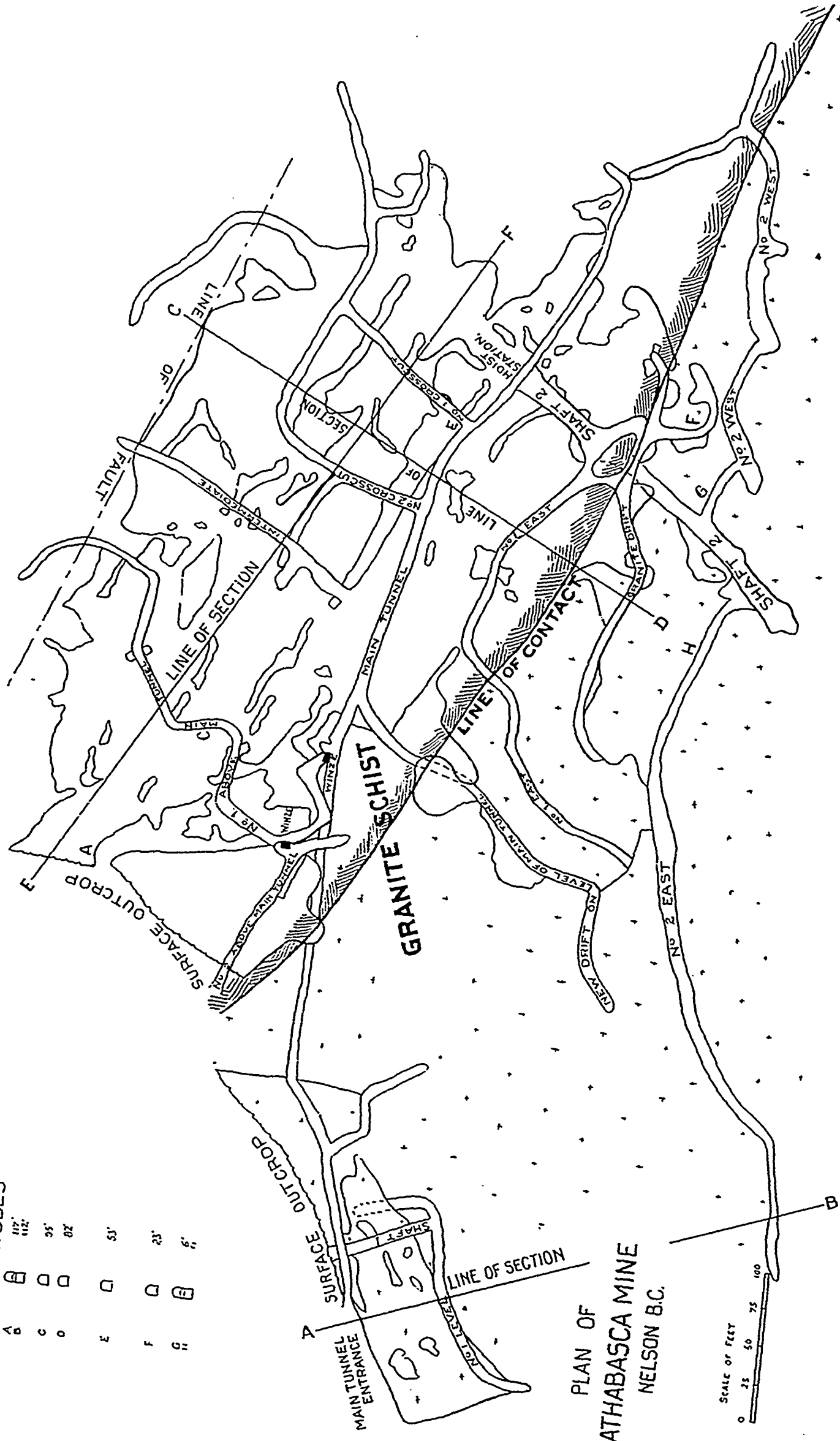
When the British-built boats employed by the Lake Superior Power Company to carry iron ore from the Helen mine to Midland last summer returned to England in the fall to engage in the ocean carrying trade for the winter instead of lying up for six months in some lake harbor, they bore cargoes of steel from the works of Andrew Carnegie: and if steel made in the United States can be exported profitably in this way, there does not seem to be any good reason why the same thing cannot be done with steel made on the Ontario side of the great lakes, particularly if the cost of accumulating the raw materials is lower than south of the line. But whether the foreign market is available or not, the home market remains. New Ontario is to be conquered and subdued to civilization. Railways are to be built, requiring iron and steel for rails, bridges, locomotives and cars, mineral deposits are to be opened up and forests are to be felled, pulp factories, sawmills and many kinds of woodworking establishments are to be called into being and equipped with machinery, and above all, great areas of cultivable soil are to be taken possession of by the farmer, whose calling demands manufactured iron and steel in a thousand forms. Old Ontario and New Ontario combined will absorb an immense amount of iron and steel, and even the prairies of Manitoba and the Northwest may yet be cultivated by ploughs and harrows fashioned from Ontario ores. The outlook for the iron industry of the Province was never better than now, and never was so much being done by the industry to meet the situation."

#### Successful Gold Mining in Ontario.

One of the few capably managed and successfully operated gold mines in Ontario during the past few years is the Belmont mine in Hastings County, owned by the Cordova Exploration Company, Ltd. The extensive development of this property under the management of Mr. Kerr has been already described in the REVIEW. The two views of the 30-stamp battery will be interesting in view of the report that this mill is to be shortly enlarged to 100 stamps.

TABLE OF ALTITUDES

A	□	112'
B	□	112'
C	□	95'
D	□	82'
E	□	53'
F	□	23'
G	□	6'



PLAN OF  
ATHABASCA MINE  
NELSON B.C.

SCALE OF FEET  
0 25 50 75 100

**Notes to Accompany One Plan and Three Vertical Sections  
of the Athabasca Mine, on Toad Mountain, near  
Nelson, British Columbia.**

By E. NELSON FELL, A.R.S.M., Nelson, B.C.

The vein cuts across a well defined contact between a schistose eruptive rock and a more recent granite. This area of schistose rocks and its northern contact with the granitoid area is shown in the reconnaissance map, published in Part B, Annual Report, Vol. IV, of the Geological Survey of Canada (Dr. Dawson's Report, 1889).

It is a narrow vein about one foot in width; the gangue is quartz, heavily charged with sulphides of iron, zinc and lead, containing high values in gold and about the same number of ounces of silver as ounces of gold.

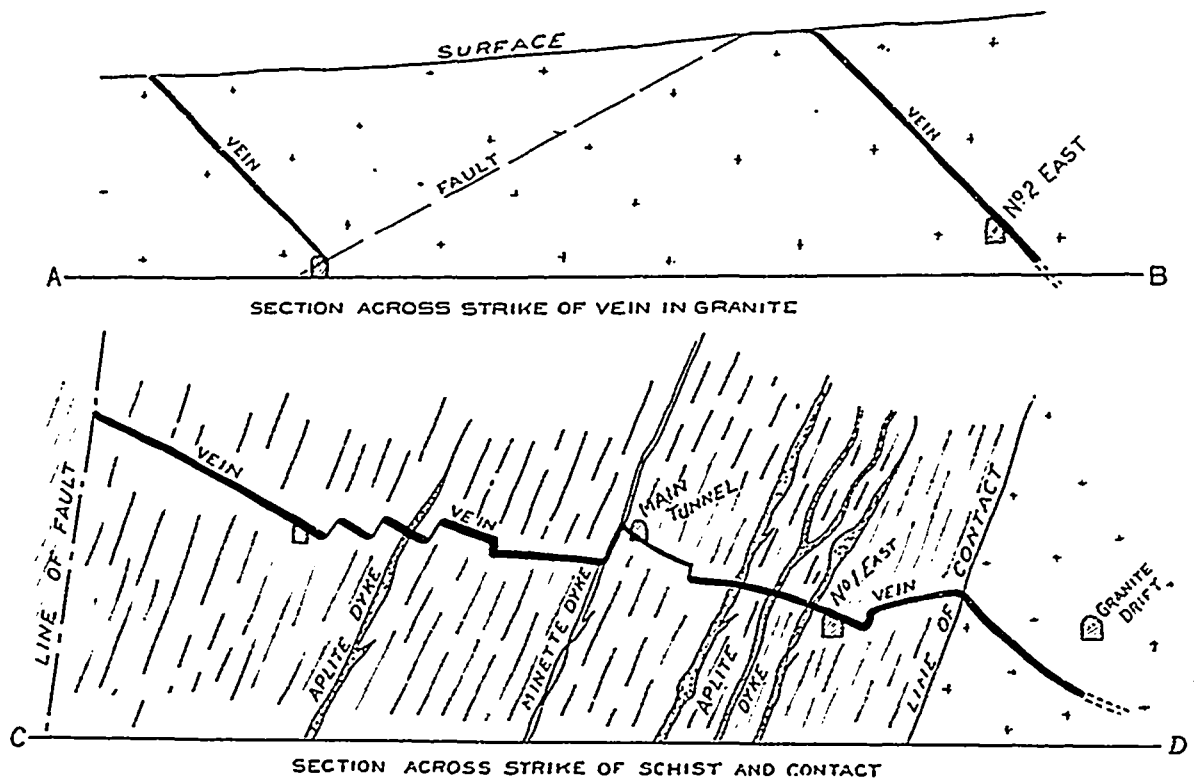
The chief characteristics of the vein are: that it is remarkably well defined; that it is very continuous; that it is broken by innumerable faults, some of which have occasioned considerable displacement of the vein; that it passes from the schist into the granite without any inter-

east and west (section through C.D.) and an upward throw at each fault running north and south (section through E.F.).

Associated with the vein (in the schist especially) are numerous aplite (acidic) dykes of earlier origin than the vein, and minette (basic) dykes of later origin than the vein. One of the latter follows a prominent fault plane throughout the mine and is shown in section through C.D. Not only is the vein faulted, but it is subject to remarkable rolls, in the course of which it sometimes assumes a horizontal position and sometimes a sharp "dip upwards," if I may use the expression. This is especially noticeable along the contact of the granite and the schist. As a result of these displacements, drifts are frequently seen at the same horizon, although 150 feet apart on the dip of the vein.

It is hardly necessary to say that to meet these extraordinary conditions, an extraordinary system of mining was necessary, which was inconvenient and expensive and could not have been carried out at all, unless the gold contents had remained persistently high.

At the end of the main tunnel, the ground became unusually disturbed; stoping had to be abandoned here and a small shaft was put



ruption or disturbance: that the values encountered in the granite are good, but not so good as those in the schist, with a tendency, perhaps, to be a little pockety.

In the maps herewith, the granite is indicated by crosses, the schist is in blank.

The discovery of the vein was made and work was commenced on a prominent exposure in the granite. A tunnel was run in at the point marked on the plan "Main tunnel entrance," and a shaft was sunk on the vein near the portal and the vein stopped out down to a fault; to recover the vein on the other side of this fault, crosscuts were put in, both on the hanging and the foot-wall side, but without result.

The "Main tunnel" was then carried on into the schist, and, shortly afterwards, encountered what was then supposed to be a second vein. This vein was very flat, and disturbed by a most remarkable series of faults, running in every possible direction. The faults were, practically always, normal; and, in following the vein up to the surface, there was a general tendency to a downward throw at each fault running

down from the point marked "Hoist Station," which ultimately passed into the granite. Along the contact, both in the schist and to a lesser extent in the granite, a remarkable concentration of values occurred which yielded very fine results in the mill: but below the contact in the shaft, and in the drifts to the west of the shaft, the vein was found in patches only, cut off by faults every few feet and thrown by each fault from 50 to 100 feet.

Eastward from the shaft, No. 2 East was carried about 500 feet, meeting the vein in fine condition about 200 feet east of the shaft, and carrying it to the present face, without faults, well defined, with a regular dip of about 45°.

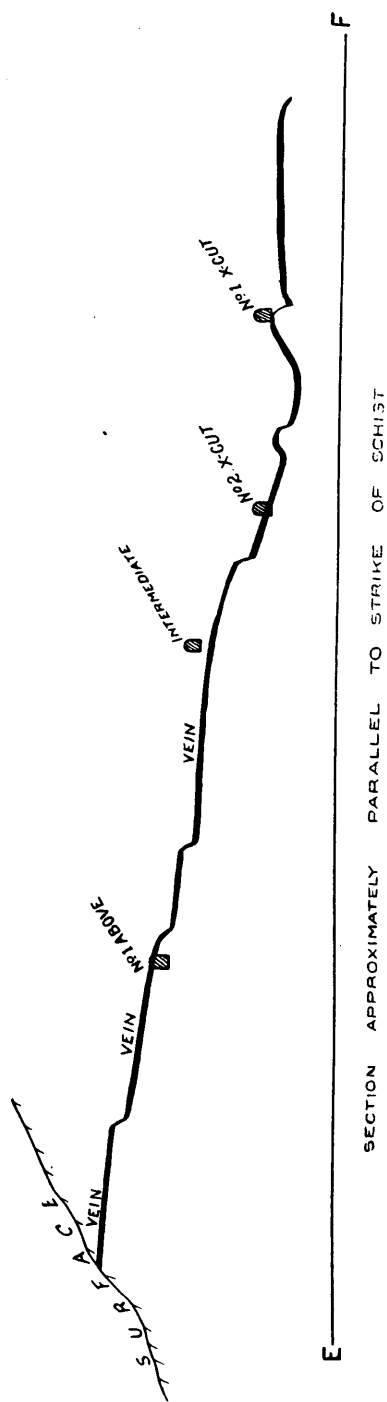
As this work proceeded, it became more and more evident, until there was finally no room for doubt, that this vein was the same as that on which Shaft No. 1 had been sunk, and that we had now come round, on the other side of the fault, to a point on the vein which lay about 220 feet from the point where it faulted. The throw of the vein along the dip of the fault was about 175 feet. The outcrop on the surface was then sought for and uncovered under the wash. This is illustrated

in the section through A.B. It is an interesting matter for speculation as to what the results might have been, had the work originally been done at this outcrop, instead of at the bolder and richer outcrop below. It is not impossible that the history of the mine would have been materially changed.

A few general points may be summed up as noteworthy.

*Firstly*: that the vein occurs cutting both granite and schist.

*Secondly*: that there is a remarkable concentration of values along the contact, especially on the schist side.



*Thirdly*: that the values in the granite do not average as well as in the schist; the vein being inclined to be more uneven, both in size and contents.

*Fourthly*: that the vein in the granite is found in a more normal condition and is better adapted for mining.

*Fifthly*: that in the schist the vein is flat and very much disturbed by faults and folds, and finally enters upon an area of ground which is so shattered that all traces of the vein are lost. It is probable that it will be recovered here at some deeper point, approach being made from the granite.

*Sixthly*: that extreme caution must be exercised in undertaking the opening up of a vein in shattered ground of this kind. Theories of parallel ore bodies and numerous veins may be rudely dispelled by events, and the plan of work must be held continually subject to modification. Only the most shadowy estimates can at any time be made of ore in sight, and the plan of operations can only be outlined in a vague way. To open up a mine of this description is an entirely different proposition to that of opening up a regular ore body. It would appear, however, that the vein, where it is now being worked in the granite, has at last reached a condition of permanency, and it is likely that it will retain this character, as further depth is attained.

I have attempted to outline the doubts and difficulties connected with opening up an ore body of this character. This is a class of mining, however, which opens up attractive possibilities and cannot be neglected. This vein yielded in thirty months \$350,000 from 11,500 tons of ore. It is an open question whether the system of limited liability company organization is adapted to a mining proposition of this kind. For conducting large operations on lines which can be definitely and permanently foreseen and laid out, the present system is no doubt to be preferred. But I believe that a system of assessable stock would be found to be more economical and, speaking generally, more suitable for working a property of the kind under discussion.

The maps above referred to were prepared by Mr. H. W. Mussen, superintendent of the mine.

#### The Prospector's Soliloquy.

"To dig or not to dig, that is the question ;  
 Whether 'tis wiser in the deed to follow  
 The lodes and bearings of auriferous metal ;  
 Or to keep watch upon the claims of others,  
 And by attention, jump them?—To sink,—to blast,—  
 No more ;—and by a shot, bring forth to light  
 Gold, pure gold, and the hundred usual signs  
 That indicate it—'tis a consummation  
 Devoutly to be wished. To sink,—to blast :—  
 To blast ; perchance to burst ; ay, there's the rub ;  
 For dynamite speaks truth, and barren quartz,  
 When fuse has run its length, stands forth in all  
 Its nakedness. There's the delay  
 Of new machinery, the cost of it,  
 No water power, wood too dear for steam,  
 The assayer's test, a partner's contumely,  
 Nor signs of proffered help, the road to clear,  
 The insolence of office, and the sneers  
 Which drive a man to think of seeking death  
 At the drill-hole's mouth, and quit the world, hoist  
 On his own petard. Who loves backwoods life,  
 To grub and rough it with weary thoughts of home,  
 But that the chance of something turning up,—  
 The unexpected nugget, to grasp which  
 All prospectors strive,—captures the fancy ;  
 And reconciles us to discomfort now,  
 To reap rewards when we are old and grey?  
 Buoyed up by hope both hearts and nerves are steeled ;  
 And thus, that he who seeks shall surely find  
 Brings to our minds both joy and sweet content ;  
 And mighty works of great scope and daring,  
 This end in view, are carried out in fact  
 Not dreamt of all day long."

**Acetylene Mine Lamps.**

Since the discovery in 1892 of the process of making calcium carbide in commercial quantities at a reasonable cost, acetylene gas as an illuminating agent has been before the public in many forms and for many uses, perhaps the best known of which is the brilliant acetylene bicycle lamp which has shown its immense superiority in all points over the older forms using oil. It has recently been introduced and is meeting with success in a field where the lighting problem is a difficult one, namely, in tunnels and mines.

Various devices using oil, candles and electricity have been presented to solve the problem. Oil has many advantages—it is cheap, is easily obtainable and the men are accustomed to its use. It has, however, two serious faults. The smoke from it is often so great as to drive men out of small workings, many mines requiring extra ventilation on this account. In gold and silver mines it cannot be used successfully because spilled oil interferes with the separation of the metal. From what figures are obtainable the cost of this method seems to average about 5 cents per miner's lamp for 8 hours use.

In the West, paraffin candles have been generally adopted in mines of precious metals. They largely overcome the difficulty of smoke, lessen the fire risk, and are generally more satisfactory than oil, but are far more expensive. Figures obtained from a silver mine in New Mexico may be considered as fairly representative though others may show wide variation. 350 men are employed and the cost of candles is \$3 per man per month, working 30 days.

It would thus at first appear that electricity would be the ideal method of lighting a mine. It has proved satisfactory in many cases, but it has drawbacks. The lights cannot quickly and readily be moved from place to place and withdrawn when a blast is to be fired. The sharp rocks cut the covering and sulphur in the water and powder fumes rapidly destroy the insulation. Conditions of operating vary so greatly that it is difficult to obtain figures which would be even approximately accurate for the cost of electricity per lamp in mining plants, but the general opinion seems to be that a 6 c.p. electric light costs from 8 cents to 10 cents per 8 hours.

The ideal light must be bright and clear, free from smoke or smell, easily transported and one which is inexpensive in first cost and cost of operation. It must above all be capable of use by inexperienced men and those found on the ground. It must be safe, durable and economical.

Acetylene gives a light the brilliance of which is beyond question and on analysis the light is found to be the nearest approach to sunlight of any artificial light yet produced. With regard to its effect on the purity of air in confined spaces, we quote from a recognized authority, Prof. Vivian E. Lewes: "The researches of Dr. Grehant have shown us that when burning with a smokeless flame, no carbon monoxide can be detected in the products emitted by the combustion of acetylene, and its sanitary position will, therefore, be defined by the amount of oxygen abstracted from the air and carbon dioxide produced, as compared with other illuminants. Taking the average sized room which would be well lighted by an illumination equal to 64 standard candles, we find that this amount of light from the various illuminants would show the following results:—

	Oxygen removed from air, cubic foot.	Products of water vapour.	Combustion carbon dioxide.
" Sperm candles .....	38.5	26.2	43.6
" Paraffin oil.....	24.9	14.0	39.8
" London gas—Bitswing burner.....	26.1	27.1	19.2
" " " Argand ".....	23.0	25.6	17.0
" " " Regenerative burner..	10.6	8.3	5.2
" " " Incandescent " ..	3.1	4.6	1.8
" Acetylene .....	5.0	2.0	4.0 "

The incandescent electric light of course is not mentioned as it is ideal in this respect, but we see that with the exception of the incandescent mantle gas burner, nothing approaches acetylene. It might also be said in justice to the objects of this paper that the paraffin oil mentioned in the table was not burned in smoky miners' lamps where obviously its bad effects would be largely magnified.

Attempts have been made to perfect an acetylene lamp which would endure the severe service imposed by conditions found even in the best tunnels and mines. The Baldwin Acetylene Mine Lamp, illustrated herewith, has been in use for the last year and during this time under close investigation, the results have been uniformly satisfactory. These lamps are now offered in Canada by The James Cooper Manufacturing Co., Ltd., of Montreal.



This lamp is made in two styles—the smaller, known as the "Superintendent's Lamp" is intended for superintendents, surveyors, mine bosses, inspectors and others moving about from place to place. It is useful for surveying purposes, as the flame when looked at end on, is only about 1/2 inch in diameter and there is a metal point on the lamp, just under the centre of the flame, which permits of its being set very accurately over a surveying point. It weighs 9 oz. and will hold a charge of carbide sufficient to keep it burning at full brilliancy for four hours. It takes only a couple of minutes to clear out and recharge the lamp with carbide and fill the tank with water.

The larger form, or "Gang Lamp," is intended for headings, enlargements, stations and switching points where a large volume of light is required to permit several men to work. The No. 8 lamp, burning 1/2 ft. per hour, gives about 20 candle power. The No. 7, burning 1/4 ft. per hour, gives slightly more than half this amount of light, or about as much as 6 sperm candles, or three oil lamps. The actual illuminating effect is far greater since it gives off absolutely no smoke to deaden the light.

These lamps are solidly made of cast iron to stand severe usage and one may be turned upside down or rolled about on its side without fear of the light going out or in any way affecting its burning qualities.

Relative to the cost of operating, it has been found that 1 lb. of calcium carbide will easily give 4 cubic feet (often more) of gas. Carbide will cost in quantities about 6 cents per pound at the mine. No. 7 lamp holds 1/2 lb. of carbide and has a burner consuming 1/4



cubic foot per hour, or a run of 8 hours for 3 cents. No. 8 holds 1 lb. of carbide, and has a  $\frac{1}{2}$  foot burner and will cost 6 cents for 8 hours light.

To afford a further comparison of operating costs, we select the New Mexico mine already referred to, working 365 days in the year, and consider it using Baldwin lamps burning  $\frac{1}{2}$  lb. of carbide per day:—

#### FIRST YEAR.

Candles for 350 men at \$3 per month per man for 1 year..	\$12,600 00
Say 365 No. 7 lamps at \$5 cost.....	\$1,825 00
175 lbs carbide per day for 1 year.....	3,832 50
	<hr/>
	5,657 50
	<hr/>
	\$6,942 50

#### SECOND YEAR.

Candles, same as first year.....	\$12,600 00
175 lbs. carbide per day.....	\$3,832 50
Repairs, say 50 cents per lamp on 350 lamps.	175 00
	<hr/>
	4,007 50
	<hr/>
Saved by using Baldwin lamps.....	\$8,592 50

These lamps have been extensively adopted by the contractors of the New York subway and have proved most suitable for their severe usage.

## CORRESPONDENCE.

### Granby Consolidated.

SIR,—I am very glad to see you taking the strong stand you do on the question of the over-capitalization of the Granby Consolidated M. & S. Co. Surely there can be no question in the mind of any mining man that this company is over-capitalized. Some mining publications are strenuous in pointing out the damage done to the mining interests of British Columbia in the abstract by over-capitalization, but when a conspicuous instance is brought before them they will do all they can to shield and whitewash the individual company. Presumably this is done to uphold the mining interests of British Columbia, but really to the damage of those interests.

With regard to the actual values of the ores of the Knob Hill and Ironsides mines, from the meagre information that has been published from time to time as to these values mining engineers could only come to the conclusion that they are now being mined and smelted at an actual loss. No information as to values has been published lately, as far as I am aware; but there is a rumor that a chute of better ore has been encountered and has been worked during the last few months, and this may account for the statement that the new plant is being erected out of profits.

The most important feature with regard to these properties, that is as it affects the mining interests of British Columbia, seems to me to be as to the future working of these veins. It seems that they are being worked at present as quarries. Now this system must sooner or later come to an end and some definite system of mining must be adopted. Every experienced mining engineer knows that large veins of that character must be mined on a carefully laid out plan in order to render them safe to work. Can any mining engineer derive any system of permanent mining which will not materially increase the cost of extraction? And will not that increased cost absolutely preclude any possibility of mining and smelting these very low-grade ores not only at a profit, but without loss? There would seem to me to be no possible honest reason for withholding the fullest information, not only from the shareholders, but from the general public. If these ores are being mined at a loss it may seem advisable to the directors to withhold any information which would show the worthlessness of the property. But if these ores are being treated at a profit, let the directors publish the fullest returns of the actual values of the ores and of the cost of production.

M. E.

Vancouver, B.C., 16th Dec., 1901.

### Dr. Ami's Letter to the Mining Society.

SIR,—That was a suggestive letter from Dr. Ami, Assistant Paleontologist to the Geological Survey, read at the recent meeting of the Mining Society of Nova Scotia; one of those letters which both friends and acquaintances would speak of in words with the syllable "un" before them. It reminds one of an all-night vigil with an open-mouthed infant, followed by burnt porridge and cold coffee at breakfast. A letter that gives relief in the writing, but is better dropped in the wastepaper basket than in the post office.

At their previous meeting the Mining Society had complained that certain maps of Nova Scotia, prepared many years ago by Mr. Hugh Fletcher of the Survey, were kept back and not issued. Dr. Ami's name did not appear in the complaint, nor was he singled out by inference; it did not occur to the mining men of that province that he, as an assistant, was responsible for the delay, or called on to explain or tax a confrere on the Survey. No one can complain if differences of opinion arise respecting the age of any series of rocks. It is to be expected under the varied conditions, and only proper that discussion occur among the members of the staff. The

earth's records, we are told at the Sussex Street buildings devoted to the study of her history, are badly injured by time, many chapters lost and numerous pages misplaced; that in the investigation it is necessary to divide up the work and specialize certain branches, that this division narrows the vision and may lead to an individual inability to estimate relative importance, and give a touch of jealousy not wholly to be deprecated since it incites and stimulates rival investigators.

Ninety-nine miners out of a hundred don't care, ahem! whether certain strata are upper Devonian or lower Carboniferous; whether they correlate with those of the same name in Europe or not; but they do object to changes of names, new terms in place of those made familiar to them by use in previous reports on Canadian geology. The schools may amuse themselves if they like over such a question; the prospector wants it understood that having once been told that the Mispec beds of New Brunswick are Devonian in Canada, and, having held that belief for thirty years, they have to remain Devonian to the Canadian, and that beds elsewhere in Canada of the same age shall be called by the same name. The Canadian miner is too much in earnest for his own interests to care what outsiders may say of the nomenclature he has accepted, and especially when he finds they differ among themselves as to the terms he should employ.

Subsequent to the publication of Dr. Ami's letter, there appeared in the press a correspondence with the Secretary of the Mining Society in which he cites the literature of the subject, and, as much of it is technical, it will be sufficient to direct the attention of those enough interested and disposed to investigate further to the references made in the Secretary's letter. The italics in Dr. Ami's letter are mine:—

"OTTAWA, July 9, 1901.

"MR. GEORGE W. STUART,

"Vice-President N.S. Mining Society,

"SIR,—I notice in the April number of *The Canadian Mining Review*, Ottawa, your interesting remarks on the work of the Geological Survey of Canada. You have no doubt a copy of the same, and I shall not repeat your statements, but I desire humbly to draw your kind attention to your reference to certain maps which 'for some reason' you state were not issued, but withheld. The Summary Reports of the Geological Survey Department for 1886 to 1900 show clearly the reason why.

"Mr. Fletcher has only to color the carboniferous areas as such, and not 'Devonian' as he insists on in spite of all paleontological and other reasons, and the maps can be issued. The maps would have been issued in 1896 or 1897 had he chosen to accept the views of those who know. It is not a great matter, but one of sufficient importance, that we do not wish to be made the laughing stock of the world by placing in one geological system what is decidedly and without hesitation in another. That is the simple statement as it is. There is no "mystery" about the delay in publication. The public has been told wherein the cause of delay rests, and unless Mr. Fletcher chooses to accept the verdict of that mass of evidence which proves the strata "carboniferous" which he insists on coloring "Devonian" with very few exceptions, for we have found typical Devonian in Mr. Fletcher's area—the very object of my researches having been to look for Devonian in Nova Scotia for the past six years.

Unfortunately certain geologists, working in Nova Scotia, have pinned their faith and geological beliefs upon old work in New Brunswick without checking that work themselves and have fallen into grave error. There is now no reason for delay—nor has there been except on the part of those geologists who may wish to place in the Devonian entire formations which are truly, unequivocally carboniferous.

"Very truly,

"(Signed) H. M. AMI."

Halifax, N.S., 21st Dec., 1901.

COLLIERY MANAGER.

[If, as Dr. Ami asserts, this letter was strictly a private communication addressed to Mr. Stuart personally and for his own information only, it is difficult to understand how it came to be discussed at an open meeting of the Society. At all events the publicity which has been given to it is regrettable, and has served no good purpose. The responsibility for the delay in the publication of these valuable maps of Mr. Fletcher's rests with the Director of the Geological Survey, and, as no appointment to this office has been made since Dr. Dawson's death, the proper course the Society should take is to address the Hon. The Minister of the Interior. We have no doubt when Mr. Sifton learns the urgent desirability for the immediate publication of these maps, and the petty, almost childish, reasons which have so far prevented their issue, he will have the matter rectified.—EDITOR.]

## MINING ASS'N MEETINGS.

**Canadian Mining Institute.**—The Nominating Committee appointed by the members have recommended the following to fill the vacancies in the Board of management for 1902: President, Mr. Chas. Fergie, M.E., Intercolonial Coal Co., Westville, N.S.; Vice-Presidents, Mr. Eugene Coste, M.E., Prov. Nat. Gas and Fuel Co., Toronto, Ont., Mr. R. R. Hedley, Metallurgist, Hall Mining & S. Co., Nelson, B.C.; Treasurer, Mr. J. Stevenson Brown, Montreal; Secretary, Mr. B. T. A. Bell, Editor, *Canadian Mining Review*, Ottawa, Ont. *Council*: From British Columbia, Mr. Frank Robbins, M.E., North Star Mining Co., Kimberley, B.C., Mr. Frederick

Keffer, M. E., B. C. Copper Co., Amconda, B. C.; from Ontario, Mr. A. P. Turner, Canadian Copper Co., Sudbury, Ont., Mr. E. A. Sjostedt, Metallurgist, L. Superior Power Co., Sault Ste. Marie, Ont.; from Quebec, Mr. J. B. Porter, M. E., McGill University, Montreal, Mr. B. Bennett, King Bros. Asbestos Mines, Thetford, Que.; from Nova Scotia, Mr. W. L. Libbey, Brookfield Mining Co., North Brookfield, N. S., Mr. Cornelius Shields, Dominion Coal Co., Glace Bay, C. B.

**Mining Society of Nova Scotia.**—This Society held a successful meeting in Halifax on 27th ultimo. A committee was appointed to interview the Hon. A. Drysdale, K. C. the new Commissioner of Mines with regard to certain much needed reforms in his Department, among them the following: (1) A government assay office (2) Technical education. (3) Encouragement to deep mining (4) An improved departmental report. (5) To revive the legislation of 1885, requiring a record of plans of the working of all metalliferous mines. (6) That in future appointments to the position of deputy inspector shall be subject to passing a technical examination. (7) That the present inaccurate maps and plans of the mine office be rectified. (8) That all rentals be made payable on two fixed days in the year.

**British Columbia Mining Association.**—At the annual meeting held in Nelson, B. C. on 7th instant, the following officers were elected: J. Roderick Robertson, President; Frank Robbins, 1st Vice-President; Bernard Macdonald, 2nd Vice President; Executive Committee, George Alexander, George Hughes, E. B. Kirby, S. F. Parrish, Fred Keffer, James Cronin, J. J. Campbell, J. Roderick Robertson; R. F. Tolmie, Secretary. Among the questions discussed at length was that of the proposed lead refinery.

**Assayer's Association of B. C.**—At a meeting of Certificated Assayers in British Columbia held at Nelson recently, an Assayer's Association was formed and the following officers elected: President, Mr. Herbert Carmichael, Provincial Assayer, Victoria; Vice-President, Mr. Alex. McKillop, Nelson; Secretary-Treasurer, Mr. J. Cuthbert Welsh, Trail. Council: Mr. A. A. Cole, Rossland; Mr. H. Harris, Nelson; Mr. Thomas Kiddie, Van Anda; Mr. D. Lay, Kimberley; Mr. H. W. Mussen, Nelson; Mr. Wm. F. Robertson, Provincial Mineralogist, Victoria; Mr. G. Sundberg, Greenwood; Mr. Howard West of Sandon.

**Mining Society of McGill.**—In accordance with a resolution adopted at the last annual meeting of this Society, the members of this Society will in March next become affiliated with the students branch of The Canadian Mining Institute.

**General Mining Association of the Province of Quebec.**—The annual meeting of this organization will be held in Montreal during the first week in March next.

## COMPANY NOTES.

**Port Hood Coal.**—Mr. John Johnstone, General Manager, writes under date of 4th instant, correcting item in our *Coal Mining and Trade* correspondence in last issue:—

*First.*—The only development work which is and has been done since June last was the ordinary driving of levels north and south, which have been extended from the slope on the north side 1,500 feet, and on the south side 1,100 feet, and which have given ample space for four balances, each with eleven rooms turned and capable of giving an output of 400 tons per day. But it was owing to an insufficient number of miners, and not because of insufficient surface accommodation, as stated, that any hampering might have occurred. While we had but few tenement houses for workmen the company erected in the early springtime a boarding house capable of comfortably accommodating 100 men, yet at no time had we more than 40 men occupying it. The menu and cost of same to workmen were considered fair and the men would have no reason to avoid it on these scores.

*Second.*—The reference to the recent damage to shipping pier is news to those living in this vicinity, and is entirely incorrect. The said shipping pier, your correspondent or informant to the contrary notwithstanding, has during the past summer been extended 135 feet into 24 feet of water, the extension being built by piling upon which were erected pockets the entire length with a capacity of 500 tons. So that since June last there has not been any difficulty in shipping coal from said pier in such tonnage as could be secured in keeping with the output, which was restricted only as above explained.

*Third.*—Reference to the slope being down 800 feet and being carried further, is also incorrect, as the slope in December last was down 1,150 feet, and has since been driven no further, the management considering they had sufficient room for the output already stated. Further sinking was therefore stopped and attention turned to opening up work as above explained. It is also incorrect to state that the capacity of the mine is 200 tons per day. But it would be correct to state that the output is, and has been, 200 tons per day owing to the causes mentioned.

I may add that the Port Hood Coal Company has not only been enabled to ship their coal by water direct from their colliery, but that they have also shipped by rail, and are still doing both, and have sent their coal along the line of the I. C. R. as far as Quebec and other important points, all of which shipments have given good satisfaction.

When it is remembered that in March last there was but little indication of Bankhead engine and boiler houses, much less engines and boilers, it certainly shows that a very large amount of construction work has been carried on in addition to the shipping of coal. At this colliery there is a bankhead with tippie screens and picking belts with engine and boilers to raise 600 tons per day. The boilers and engine power are capable of hand-

ling 1,000 tons per day, so that it is only a question of opening up the mine to enable its being done, and undoubtedly such is the Company's intention, as they propose at the close of navigation, which will be at the end of December, to at once begin to sink the slope a further distance of 600 feet. This done, and additional levels turned and driven sufficiently will enable them to materially increase their output. It may be further stated that we have our pumps driven by compressed air, a compressor having been installed for the purpose, and also for the purpose of experimenting with coal mining machines, which said experiment has been made with most satisfactory results.

The James Cooper Co. placed one of their Ingersoll Sergeant G 4 cutting machines at this colliery, and operated by one of their men he succeeded in undercutting in the third shift three rooms 12 feet wide and 4½ under, the seam lying at an angle of 23 degrees. As the machine was rough on account of its not having been in use heretofore, the test was considered a very good one, and the result obtained will largely induce the Company to introduce the machines next year.

**Centre Star Mining Co.**—The accounts for year ended 30th September last as submitted to the shareholders on 26th ultimo are as follows:—

ASSETS.		
Centre Star Mine.....	\$3,300,540	00
Cash in Bank of Toronto, Toronto.....	10,603	90
Stores on hand as per Inventory.....	38,329	99
Machinery, Buildings and Equipment.....	249,517	57
Furniture of Offices.....	1,360	90
Invested in War Eagle Hotel.....	12,500	00
Accounts Receivable.....	1,531	25
		\$3,614,383 61
LIABILITIES.		
Capital Stock.....	\$3,500,000	00
Bank of Toronto, Rossland.....	40,728	50
Accounts Payable.....	13,526	33
Profit and Loss.....	60,128	78
		\$3,614,383 61

### PROFIT AND LOSS ACCOUNT.

DR.		
To Balance brought forward.....	\$182,122	10
" Direct costs of Mining & Development.....	\$258,349	23
" Fixed and General Expenses, Aug. and Sept. (Mine closed).....	5,432	71
" Diamond Drill Prospecting.....	2,184	28
" Extralateral Litigation.....	7,685	30
" Other Legal Expenses.....	2,290	49
" Mine Accidents.....	925	50
" Consulting Engineers' Fees.....	1,850	00
" Managing Director's Salary (3 yrs.).....	7,500	00
" Travelling Expenses.....	239	19
" Interest and Exchange.....	588	70
" Auditors' Fees.....	154	00
" Toronto Office Expenses.....	1,128	93
" Trail Smelter Examination.....	2,670	79
" Sundry Expenses.....	753	60
" Amount written off for depreciation in Plant, etc.....	22,019	54
		\$313,772 26
" Dividends, Nos. 2 to 6.....	\$175,000	00
" Balance carried Forward.....	60,128	78
		235,128 78
		\$731,023 14

CR.		
By Net Proceeds from Ore Sales.....	\$694,643	71
Less Provincial Ore Tax.....	13,889	92
		\$680,753 79
" Transfer Fees.....	269	35
" Premium on Capital Stock sold in 1899.....	50,000	00
		\$731,023 14

**Le Roi.**—The directors of the Le Roi Mining Company have received the following cable from Mr. Frecheville, dated Rossland, November 25th:—Auditors make profit from mine and smelting works for the year ended June 30th, \$586,000. This was used for improvements. All the plant first class. I estimate the reserves of ore at date above the 900 feet level 484,000 tons of 2,000 lbs.; value per ton, \$11.75. The total cost per ton in the future ought not to exceed \$9.00 dolrs. The lowest level in the mine, so far as driven, shows chute of ore 170 feet in length, 24 feet in width; assays average \$15.75 per ton. Shaft is down 1,050 feet. Will start driving levels as early as possible. Inventory, November 23rd (at), smelting works shows ore, matte on hand and in transit, and supplies, \$1,045,000. At the mine, low-grade ore dump, \$100,000 net.

The directors wish to give the following explanatory details. Simultaneously with the examination of the mine by Mr. Frecheville, an audit of the books of the company at Rossland has been conducted by Messrs. Price, Waterhouse and Co. Their audit shows a profit for the year ended June 30th, 1901, of \$120,576 all of which has been expended in improvements on the property, the result being that the mine is thoroughly well equipped with all the most approved modern machinery, and the capacity of the smelting works, which are excellent in construction and design, and fitted with all the latest labour-saving appliances, has been largely increased. The 900 feet level which is the lowest level as yet opened up in the mine, appears to the directors to be highly satisfactory the lode, as far as tested, being of good width and high grade.

Mr. Frecheville, in a letter to the board, says that the pay chute on this level started with a width of 12 feet, and in the 170 feet of driving done it

has opened out to a width of 35 feet in the face. This, of course, is a matter of the most vital importance in estimating the future profits of the mine, showing as it does that the values of the ore are more than maintained at this, the greatest depth exploited. The liquid assets, as given by Mr. Frecheville, amount to £235,596. In addition to this, there is about £20,000 owing to the company by other companies, which will shortly be paid. These assets exceed the total liabilities of the company by approximately £51,000. A report on the property by Mr. Bernard MacDonald, the late general manager, was published on the 2<sup>nd</sup> inst. This report was received at the London office on August 24th, and therefore by the board as constituted before the extraordinary general meeting of shareholders, held on August 29th. The report was accompanied by a statement of accounts covering a similar period, and these were immediately handed over to the auditors of the company for examination. The auditors subsequently informed the board that they were unable to accept the accounts in their then form, and at their request Mr. MacDonald was written to asking for further details. This report from the auditors was made, to the board as constituted after the extraordinary general meeting above mentioned. At that meeting Mr. Frecheville had been appointed by the shareholders to examine and report on the property, and the directors were of opinion it would not be right to issue Mr. MacDonald's report and balance-sheet without further confirmation.

**Le Roi No. 2 (B.C.).**—December 2nd. Monthly shipments of ore 4,870 tons. Contents 2,483 ounces gold, 8,770 ounces silver, 123 tons copper. Gross value \$95,500. Deduct smelting charges, \$40,250. Cost of mining, \$15,250. Total, \$55,500. Net profit, \$40,000.

**Dominion Coal.**—This company is the largest organization of its kind in the Dominion with its mines in Cape Breton, Nova Scotia. The effect of the good times on the securities of that company can be traced in the price movements in the Montreal Stock Market. There are excellent reasons for believing that the financial position of the company has been much improved during the past year and that had a great deal to do with the appreciation in the value of the company's shares. The company pays 8 per cent. per annum on the \$3,000,000 of cumulative preferred stock, but so far has paid nothing in the way of dividends on the \$15,000,000 of common stock. Notwithstanding that the price of the common has been one of the strongest features of the local stock list for some weeks, and the market is believed to have absorbed considerable quantities of the stock offered by sellers in the Boston market. There is reason to believe that Canadians hold the bulk of the stock of the company now. Early in the present year the stock was selling between 34 and 35. At that time the common shares would then be worth as a whole \$5,250,000. So great has been the confidence in the future of the company and its capacity to eventually pay the common shareholders a dividend, the value of the shares has risen to between 47 and 48. The value of the shares may be now placed at \$7,050,000 on the basis of 47 per share. This shows a total appreciation of \$1,800,000 in their value. To that amount must be added the enhanced value of the preferred shares which have also improved considerably. At the first of the year they were selling at 109, now they are worth 120 or more a share. Their total value has accordingly jumped from \$3,270,000 to \$3,600,000, or a rise of \$330,000. Adding the two amounts together makes a total appreciation of \$2,330,000, not a bad showing for the past twelve months.

**Molly Gibson.**—The adjourned Annual General Meeting was held at the Windsor Hotel, Montreal, November 30th. It was decided to defer the building of a smelter until the silver-lead situation assumes a more stable basis. There are 450 tons high grade ore sacked ready for shipment and 4,200 tons second class ore on dump. All work is now being done by contract, the company having secured very satisfactory terms. No ore will be shipped until better prices than those now ruling can be obtained. Thomas Kelly, Winnipeg, was elected to fill the vacancy on Board of Directors caused by resignation of J. H. Brock. Number five tunnel has cut the lead and drifting along it is now being pushed. The ore here averages 126 ozs. silver and 17 per cent. lead. The uncovering of the lead in this new tunnel gives the vein a total length of 2,100 feet and depth of 850 feet. The average width being about 16 inches of ore; there are estimated to be about 225,000 tons in sight. Number six tunnel, 250 feet below number five, will soon be started and it is expected that the two veins will come together there as the Florence vein is vertical and the Aspen dips toward the Florence.

**Winnipeg.**—The Winnipeg mine during the month of November shipped seven cars of ore to Trail and also sent a trial shipment of 40 tons to the Greenwood smelter. The eight cars yielded the company \$1,800 over freight and treatment. The average value of the November shipments was the best yet secured, and although the tonnage shipped was under the average of the last three months, yet the gross receipts were \$300 above the monthly average. Shipments to the Trail smelter are about to cease, the company having secured more favorable freight and treatment rates from the Greenwood smelter, and as soon as the new additions to the Greenwood smelter are completed the Winnipeg will ship to it.

**Baltimore and Nova Scotia.**—This company, successor to the Guffey-Jennings, late owners of the Lake Lode Mine, Caribou district, has the vertical shaft down 650 feet. The company will probably not tap the lode again, until 750 feet. A winze has been sunk on the slope 300 feet west of the shaft on the 500 ft. level to a depth of 90 feet. A large amount of other development work has been done. Another vein apparently equally as valuable as the Lake lode has been opened 700 feet south, and is tapped by shallow shafts in 6 places, proving continuity for 1,100 feet. The company will have in operation in some 6 or 8 weeks a 40-stamp mill, with all modern improvements and will probably cyanide the tailings. The cost of the mill will be about \$60,000. A 14-drill air compressor is being installed at the head works. The principal owners are Baltimore, Md. men. The general manager is L. W. Getchell, and the secretary-treasurer is A. S. Dunham, of Boston.

**Black Cock.**—The annual meeting of the Black Cock (Ymir, B. C.) Gold Mines, Ltd., was held this month at the offices of the company, Rossland. Mr. A. J. McMillan, the chairman, presided. The report and

accounts for the year ending September 30th last were presented by the Secretary, W. Tomlinson, and after consideration were adopted. The following directors and officers were elected for the ensuing year: A. J. McMillan, Chairman; A. Julien, Vice-Chairman, Mayor Lalonde, A. Audet and J. L. G. Abbott, Directors; W. Tomlinson, Secretary. It was stated that negotiations were in progress looking to the resumption of work on the property, which is one of the best known in the Ymir district. Already several hundred tons of ore of high grade have been shipped from the Black Cock mine to the Nelson and Northport smelters. The outcrop of ore on the surface is one of the best defined in the district, and in the opinion of mining men who have visited the property it is only a question of time and money before the Black Cock will develop into one of the large mines of the district. The ore is almost identical with that of the Ymir mine, situated about one mile distant. The last shipment of ore from the Black Cock mine averaged \$40 to the ton.

**North Star.**—Directors have reduced usual dividend from 3 per cent. quarterly to one-half that amount. The causes assigned are the reduction in the price of lead and the discontinuance of work caused by a disagreement with the miners. Development work will be pushed as soon as the trouble is ended. The directors for the ensuing year are D. D. Mann, W. A. Mackenzie, Senator Thibadeau, H. S. Holt and C. E. L. Porteous.

**Athabasca.**—The attempt to reconstruct for a second time, the Athabasca Company in London, has been effectually frustrated by the action of a Mr. E. E. Weber, of New Westminster who, with the knowledge and consent of other Canadian shareholders, applied for and obtained an order from the courts for the winding up of the concern. In the petition supporting the application for the winding up of the company, it is stated that the debts of the company are in the neighborhood of \$50,000, the greater proportion of which is owing to people in this Province. It is further stated as believed by the petitioner, that it is the intention of the liquidator of the Athabasca, who was appointed at a meeting of the company held in London on the 7th of August, to convey the property of the company to a new company to be formed, which new company will pay for the same by the issue of stock assessable to the extent of five shillings or more on the pound, which assessment if made will produce \$125,000 or more. This call, it is set out, is excessive and unnecessary, and payment thereof will be beyond the means of many of the shareholders of the company, and that through failure to make payment of such call such shareholders will lose their interest in the company. The petitioner further sets out his belief that in the event of the company being wound up that its property could be sold at a price which would pay all of its indebtedness and leave a considerable margin to divide among its shareholders. The granting of the winding-up order by the courts will seem to set at rest the repeated reports that an early start is to be made in the resumption of work at the mine, and that when it does resume either the Canadian or English shareholders, or both, will be out of it. Locally, the opinion seems to be that the English shareholders are anxious to proceed with reorganization with sufficient assessment on the stock to wipe out all the liabilities and leave a substantial margin for development purposes, but that the Canadian shareholders are more concerned in getting out of the concern without further loss.

**Granby Consolidated.**—The second furnace will be blown in early in the new year and capacity of the present plant doubled. The smelter was blown in February 18th of the present year. From that date to October 31st it has treated 91,715 tons. To come down to months the last two will suffice to give an idea of the daily tonnage treated. In September the total amounted to 11,823 tons, or a daily average of 393  $\frac{1}{8}$  tons. For October the total was 12,660 tons, being an average of 408 tons a day. On October 18th Mr. Paul Johnson, M. E., manager of the smelter, believed he established a world's record for a single-blast furnace of the size in use here. On that day 504 tons of ore, coke and slag were run through. Of this amount 450 tons were ore.

## MINING IN NOVA SCOTIA.

Mr. J. R. Stuyversant who has been successfully cyaniding old tailings at Caribou during the past summer and has cleaned up 2,025 ounces of gold, has made arrangements with the Richardson Gold Mining Co. to buy their tailings after they leave the plates. Mr. Stuyversant is getting out the plans for a 150 ton plant which he will at once proceed to erect.

Mr. Harry Saunders has severed his connection with the St. Anthony Gold Mining Co.

The National Mining Co. have put in an air compressor in their mine at Mount Uniacke and will erect a small cyanide plant. They have struck a new ore chute in the west end of the mine, a trial run from which gave 2 ounces to the ton.

The East Lake Mining Co. at Mount Uniacke cleaned up 90 ounces last month.

The Great Belt Mining Co. at Mount Uniacke have their 30 stamps running and have made two clean ups of 100 tons each giving 10 and 9 ounces respectively.

The Mic Mac Gold Mining Co., successors to Cashon Hines at Leipsigat returned 320 ounces for the four months ending September 30th.

The Baltimore and Nova Scotia Mining successors to the Guffey Jennings Mining Co. have completed their new 40 stamp mill and propose adding a cyanide plant in the spring.

We are pleased to be able to chronicle the fact that the case of McKenzie vs. E. and C. Thompson has been settled out of Court. We shall expect to hear of some more phenomenal returns again now from their Jubilee Mine at Renfrew.

The Touquoy Mining Co. returned 142 ounces from 216 tons for October.

The railway connecting the Richardson Mine with Isaacs Harbour is completed and the engine has arrived. The company will now be able to get their coal to the mine and their concentrates to the harbour more cheaply than by the old method of carting.

The Evangeline Gold Mine which was recently purchased by Mr. Link is in the hands of the Sheriff.

Messrs. Sidney Smith *et al* who erected a 100 ton cyanide plant at Waverley have closed down, having treated some 1,700 tons and obtained a product of 5 ounces.



## MINING SOCIETY OF NOVA SCOTIA.

### A Remarkable Letter from Dr. Ami—Government Assistance to Deep Mining—The Payment of Rentals—Mines Report, Government Assay Office and Other Matters Discussed.

A meeting of the Mining Society of Nova Scotia was held at the Halifax Hotel, Halifax, on 28th ultimo, Mr. W. L. Libbey, President, in the chair.

Among those present were:—Messrs. H. S. Poole, Geo. W. Stuart, A. A. Hayward, Charles Archibald, Charles Starr, R. H. Brown, Charles Fergie, Alex. McNeil, Geo. E. Franklyn, F. H. Mason, H. D. McKenzie, H. M. Wyde, G. Troop, M. R. Morrow, and Mr. Holland.

The Secretary read the minutes of the last meeting, and on motion they were approved.

#### WHY MAPS WERE DELAYED.

Mr. GEO. STUART—I might report that I had a letter from one of the officers of the Geological Survey Department, and although it was written to me personally, it occurred to me that under the circumstances it ought to be laid before this Society. It is a letter from Dr. Ami, of the staff, giving his reasons why certain maps have been withheld. It was addressed to the President of the Society on the outside, while it is addressed to the Vice-President on the face of it. I wrote to him I thought it was a matter that should come before the Society and if he had no objection I would place it before this meeting. I would like to make it clear that I wrote Dr. Ami asking permission to use this letter before this Society. As he has not replied to my letter, of course I take his silence as consent that I may do so. I had a short interview with Mr. Fletcher and he assures me that the maps are in process of issue and that there will be no material change in the findings of himself and others of the staff, so I expect they will be issued at an early date.

The SECRETARY then read Dr. Ami's letter (reproduced elsewhere).

Mr. HAYWARD—That may explain the delay with reference to coal measures, but it does not explain it with reference to gold measures. Surveys were made four years ago and the proofs have not reached the printer's hands yet.

Mr. CHAS. FERGIE—I understand the Hon. Mr. Sifton has taken the matter in hand and he is determined to push it through.

Mr. H. S. POOLE—I would not complain of four years. A map may be a work of ten years or more.

Mr. GEO. STUART—I think it would be well to ask Mr. Fletcher to reply to Dr. Ami's letter.

Mr. CHAS. FERGIE—I move that a copy of Dr. Ami's letter be sent to Mr. Fletcher for his comments for the further instruction of this Society.

Mr. CHAS. ARCHIBALD—I second that motion.

#### GOVERNMENT ASSISTANCE TO DEEP MINING.

Mr. GEO. STUART—Mr. President, It has occurred to me that a question which has frequently been before the Society in former years might be revived, namely, that of encouragement to deep mining in Nova Scotia. It occurred to me that we might perhaps to-day pass a resolution authorizing the Committee that has been appointed to meet the Government regarding the question of the Assay Office, and Technical Education, to impress on them also the advisability of offering some inducement for the sinking of a deep shaft—deep workings in our gold mines.

Mr. CHAS. FERGIE—Would you not include coal too?

Mr. GEO. STUART—If you think you require it?

Mr. CHAS. FERGIE—I think we do.

President LIBBEY—I think there is somewhat of a feeling among our Provincial officials that it is not of any use to do any deep gold mining in Nova Scotia. For instance, has it not been said that a diamond drill that would be used for gold mining need not go over 500 feet—that was deep enough. And does not Mr. Faribault in his papers convey an impression, probably, that it is better to scratch around near the grass roots?

Several Voices—No. To the contrary.

Mr. A. A. HAYWARD—I have heard that same suggestion thrown out.

Mr. F. H. MASON—So far as the legs of the saddles—but if you go down on the axis of the anti-clinal, he advocates deep sinking.

Mr. GEO. STUART—And that you get recurrences of everything on the surface.

Mr. F. H. MASON—Yes.

Mr. A. A. HAYWARD—In what form would you suggest assistance?

Mr. GEO. STUART—We have never been able to agree, and I do not think we will be ever able to agree, so that we could approach the Government to give any special inducement to sink a shaft in any particular district. I think the inducement which they should offer would be applicable to any district, and it is this, that all gold over a certain term of years obtained below the 500 feet level, should be free of royalty—that to be the inducement.

Mr. CHAS. FERGIE—I am prepared to put a shaft down 2,000 feet tomorrow if the Government will give me free royalty on coal. I will start it tomorrow, if they will give me the royalty.

Mr. GEO. STUART—But you would not have that apply to any of the present seams that are worked?

Mr. CHAS. FERGIE—Why not?

Mr. GEO. STUART—What would be the inducement to the Government?

Mr. CHAS. FERGIE—The inducement is to allow you to compete with other cheap seams—surface seams. Every hundred feet you go deeper you are increasing your cost, and you are going to reach a point in coal mining that you cannot possibly work. I am speaking now of vertical workings.

H. S. POOLE—You mean with respect to a shaft that was made vertical and not after workings had reached that depth by inclines in ordinary course of working.

Mr. CHAS. FERGIE—I am speaking of a vertical shaft.

Mr. GEO. STUART—In the case of gold mining it would be different. I think it ought to apply to the depth of your workings which are on the slope of the lead.

Mr. CHAS. FERGIE—I do not think that the gold mines have any more to complain of than a coal mine. You have no market to compete with.

Mr. GEO. STUART—So much the worse for us. In your case you know and in fact are absolutely sure that your seams do go down to a depth of 2,000 feet, and probably deeper, and that your coal will be just as good, and that you will obtain just as much at a greater depth as you do at your present depths.

Mr. CHAS. FERGIE—That does not follow.

Mr. GEO. STUART—It follows that you are absolutely certain that your coal goes to great depths.

Mr. CHAS. FERGIE—It is not so.

Mr. GEO. STUART—Our gold leads, it is thought, will not produce sufficient returns at greater depths to pay us to go down. That is the impression. And if the Government would offer an inducement I believe it would be an excellent thing. I would make all gold obtained below a level of 500 feet free of royalty.

The SECRETARY—Would they not be apt to meet you with this reply—what gold is taken out below that level?

Mr. GEO. STUART—That brings up the question that we ought to impress upon the Government to appoint an Inspector such as they have not at present, to go to the mines and determine where the gold comes from. I would also like to follow up these remarks and criticize the annual report issued at the present time, and make comparison with the report of British Columbia as compared with the Nova Scotia Mines Report.

The SECRETARY—I think this same question of deep sinking was brought to the attention of the Government before, and they were perfectly willing to concede to the request if we could devise a way and means and could agree.

Mr. GEO. STUART—And I think too, that perhaps part of our failure at that time was partly due to the fact that the Commissioner of Mines took no interest in the matter. But now we have a man of a different character occupying that position. I am not speaking disparagingly of the late Commissioner at all. But we have a younger man now, a more progressive man, and I think he is ready to advocate any reasonable proposition that we place before the Government.

Mr. A. A. HAYWARD—Don't you think that the Government should have some incentive for doing this.

Mr. GEO. STUART—I would say the removal of the royalty for a term of years would be the incentive. You might say five years, or if you like say ten years.

Mr. A. A. HAYWARD—Some 15 years ago, I had occasion to go over this same matter with a gentleman in this Province. We found it necessary to get data from Australia, and we found that there they were at one time in the same position as Nova Scotia is to-day. The Government of the various Provinces in Australia made arrangements to suit the exigencies of each case. In one of their Provinces they subsidized all mines 900 feet in depth; and in other Provinces they prepared a scheme for the Commissioner to assist mines that were deserving without touching the question of royalty at all. I do not think there is anybody but is thoroughly convinced of the presence of minerals in our veins here, and the question is to interest capital and get the Government to do something. The Government must have an incentive, and that is the royalty.

Mr. R. H. BROWN—How would it do to leave the royalty untouched and let them get the Government to assist. If it was for 500 feet that they would give them a proportion.

Mr. H. S. POOLE—Said that he would like to see the Government committed to a certain policy—the details of that policy might be modified afterwards.

President LIBBEY—With such a resolution as this of Dr. Stuart I could go to work with clean hands. They could not say I was asking anything for myself.

Mr. H. S. POOLE—If we can only agree among ourselves on the wording of a resolution we can get the Government committed to the policy.

Mr. GEO. STUART—If there is any company to-day operating below 500 feet and their works are confined purely to development work, sinking, proving their lead, I think that although they may be considerably below 500 feet that they should not be debarred from reaping the benefits which this resolution would convey—because in mining parlance, you are not mining



until you are extracting ore, working ore for a profit. In sinking for development purposes it is another thing.

Mr. A. A. HAYWARD—It seems to me the object of the resolution is to induce people to prove the certainty of our mines; to prove what we believe. Now the question is if that is not incentive enough. To show that the ore does not "peter out" at 200 feet.

Mr. CHAS. FERGIE—If you have not got confidence how can you expect outsiders to have?

Mr. GEO. STUART—(To Mr. Hayward) when you speak of your mine "petering out" I take exception to that. There is no man in this room ever saw the bottom of a mine.

Mr. A. A. HAYWARD—You can see values reduced.

Mr. CHAS. FERGIE—You can see the bottom of a mine when your capital is gone. (Laughter).

Mr. A. A. HAYWARD—I think the practice in Australia is a very good guide for us here.

Mr. GEO. STUART—I would be pleased to make this motion:

"This Society would ask the Government to consider the desirability of remitting royalty on gold from ore stoped from a depth greater than 500 feet vertical during the next five years, and from mines now working below such a depth, where only for development purposes."

I think this would be quite sufficient to begin with, as Mr. Poole has remarked, if we once get an inducement we could get them committed to that policy. I had a very satisfactory conversation with the present Commissioner of Works and Mines. He is quite favorable to offering us any reasonable inducement to deep sinking in Nova Scotia.

Mr. CHAS. FERGIE—I have discussed the same question with respect to coal with Premier Murray, and he has expressed the same opinion.

Mr. GEO. STUART—With respect to any proposition that we desire to make, it would not be necessary to wait until the House was in session. I think it would be well if it were made to the Commissioner in order that he would bring it up at the next meeting of the Executive.

Mr. F. H. MASON—I second the motion.

Mr. CHAS. FERGIE—I do not think it is going to interest capital. It is too small a matter.

F. H. MASON—If I were working a mine I would rather have the royalty off than be paid so much a foot as I go down.

A. A. HAYWARD—You want to reach the investing public. You want a subsidy of some kind to induce the people to invest their capital. One of the Australian Provinces gave a subsidy for every foot over 900 ft. level.

President LIBBEY—I am a good deal a theorist in politics. While there have been undoubted benefits arising from the paternal form of government, yet I do not believe in it. A man is always at his best when he is going ahead on his own resources, and nations are at their best when they are depending upon the individual resources of the people. Charity in any form is demoralizing. The recipient of charity simply lays back and basks in the sunshine, and holds his hands up for more charity. I am doing as much deep mining as anybody in Nova Scotia, and I have not asked for any aid. I would like to have the 25% taken off chrome steel shoes and dies. The resolution was then put and passed unanimously.

#### FIXED DATES FOR HALF YEARLY PAYMENTS OF RENTALS.

GEO. W. STUART—It was suggested to me by a mining man some time ago that it would be a good move by the Department of Mines to have half yearly dates of payment for all rentals—that is, if two fixed dates for the payment of rentals should be possible, say the 1st of January and 1st of July. It would simplify the work in the Mines Office very much, and they could send out all their notices on the same day. It would also save a great deal of bother to those who have a great number of rentals to pay, having to keep themselves posted daily. By having two dates of payment it would simplify matters very much. For instance, suppose you take up an area today, the rental on that area will begin from the beginning of the year. If you take it up after the beginning of the year the rental will begin half yearly. There will be two fixed dates at which the notices will be sent out, so that we would only have to pay rentals twice, instead of, as some of us have, of paying it almost every day.

A. A. HAYWARD—I think that is an excellent idea. That system was tried in the payment of dividends in assessments in Australia. All companies making assessment on a certain day, the assessment was due on a certain day a dividend was payable. I think it is a capital idea.

GEO. E. FRANKLYN said he concurred in the suggestion of having the rentals payable in January and July.

President LIBBEY—That would be very good, in one case. I held quite a number of leases, and to achieve that same result I surrendered the whole and took out a new lease, and in doing it I lost quite a number of dollars, but the advantage of having them come together was enough to offset the loss. I simply wanted to get them all on one date.

GEO. W. STUART—I surrendered 19 leases to get them to come due on one date. But I hold a great number of leases in which different people are interested, and these I could not surrender. But this particular block was held by two of us only and we agreed to surrender the whole and take them under one lease. Of course you have got to confine yourself to one district. I should imagine that the Mines Department have got to keep a clerk going over the book the whole time, but if they only came due half yearly the work would be simplified very much indeed.

#### MINES REPORT.

GEO. W. STUART—I wish to say something about the very meagre, inaccurate and badly compiled reports (The Annual Report of the Department of Mines) which the Government have been issuing for some years.

President LIBBEY—I happened to be in the Mines Office this morning, and I was asked why we did not say something about their reports. I was told they were waiting to hear from us.

GEO. W. STUART—The subject of an assay office, technical education, rebate on royalty in deep mining, and the advisability of issuing a better Mines Report, could be brought to the notice of the Government by one committee at the same time.

ALEX. MCNEIL—I believe the Government would publish a better Mines Report if we suggested how to do it.

GEO. W. STUART—There (pointing to the British Columbia Mines Report) is a capital suggestion in the way other Provinces prepare their reports.

President LIBBEY—We can imitate that system.

GEO. W. STUART—We have better material here for such a report.

H. S. POOLE—All we need to do is to point to the report of British Columbia and ask the Department to give us such a report.

President LIBBEY—I think nature has done as much for us as it has for British Columbia.

GEO. W. STUART—They could not issue a more meagre report than what they do. Those issued during the past few years do not begin to compare with the reports issued 25 years ago.

F. H. MASON—It is all made up in haste about the end of September, and we ought to approach the Government pretty soon about it.

GEO. W. STUART—The House wants to have this matter brought to its attention. I fancy there are not 10 per cent. of the members of the House that know anything about the character of the reports issued in the other Provinces.

H. S. POOLE—Would it not be well for the Mining Society to ask permission for a committee to go before the Mines and Minerals Committee of the House and the Executive on a certain day and produce for their information copies of the Mines Reports of the other Provinces, and furnish them with any other information necessary.

GEO. W. STUART—Yes.

#### GOVERNMENT ASSAY OFFICE.

ALEX. MCNEIL—There was a proposal made in Mr. Stuart's paper that we should urge the Government to provide a Government Assay Office, and it was mentioned at the time in reply to a question that the Premier had said last session that the Government had that under consideration and that he hoped he would be able to bring it about within a short time. We thought that if some definite move were made that we could induce the Government to provide for it at the coming session. It appears to me that now would be the time to move in that particular matter. I think the work could be done by the present committee. There are the four matters mentioned by Mr. Stuart upon which the committee could approach the Government.

GEO. W. STUART—I think Mr. McNeil is quite right.

The SECRETARY—One committee could attend to all four. Why not decide upon what points we desire to interview the Government on?

ALEX. MCNEIL—Is it not so that this Society has been endeavouring to do something about the Government Annual Mines Report for a number of years?

The PRESIDENT—Yes.

ALEX. MCNEIL—Has not the Government been approached several times about it?

The PRESIDENT—Yes. Dr. Gilpin only this morning said to me that "we are waiting for some suggestion from your Society," Dr. Gilpin is in the line of forcing us a little bit.

H. S. POOLE—They know about these reports of Ontario, British Columbia and Quebec.

ALEX. MCNEIL—The point I wanted to mention was this. I was asking whether this Society was not for years complaining about this annual report without any result, and it is now getting, you will admit, worse.

H. S. POOLE—Having pointed out to them what is done in other Provinces the Mining Society can do no more than suggest that an improvement is desired.

The PRESIDENT—Dr. Gilpin said to me this morning that they were waiting for our suggestions.

GEO. W. STUART—Who were waiting?

The PRESIDENT—The Mines Department.

The following resolution was then adopted:—

"That the two committees (W. L. Libbey, Geo. W. Stuart, A. A. Hayward, Alex. McNeil, H. S. Poole, F. H. Mason, S. H. Holmes, and Geoff. Morrow) be combined in one committee to interview the Government in relation to the following subjects:—

- (1). A government assay office.
- (2). Technical education.
- (3). Encouragement to deep mining.
- (4). An improved departmental report.
- (5). To revive the legislation of 1885, requiring a record of plans of the workings of all metalliferous mines.
- (6). That in future appointments to the position of deputy inspector shall be subject to passing a technical examination.
- (7). That the present inaccurate maps and plans of the mines office be rectified.
- (8). That all rentals be made payable on two fixed days in the year.

#### MINE'S OFFICE PLANS.

H. S. POOLE—With respect to the plans in the Mines Office I had occasion to take up the so-called mining plans issued by the Government for years to applicants, and to compare them with the admiralty charts and accurate surveys by private companies. I found on comparison that these maps did not agree—in fact there was an error in one case in a distance of not more than six miles of half a mile. A lake that should appear in the middle of an area according to the map of the mines department, was on the side line. It was therefore evident to anyone who compared the map with the natural objects that it was misleading—a stranger can not go on the ground with a Nova Scotia Mine's map and find out where his area is. I think this is a bad condition of affairs.

The PRESIDENT—I have had an exactly similar case to yours on my own property which was the original property taken up in the district—and the base line was established by presumably a competent surveyor. At any rate he was a surveyor. A year or two ago the Government sent another surveyor down. The two surveyors took the same original starting point. The Government surveyor, goes down and runs out this line here (indicating on the table) and this one here, and when he gets around to this corner he

is a rod away from the other fellow, and the result is we have two corner posts in there. I bought my surface rights on the original survey, and since then we have added a roadway to the public, and there are various improvements which make the surface rights worth something. Now the whole thing is a rod out. And another thing up here a little further, I found some property which I think is quite valuable and the vein on one survey runs exactly on the outcroppings of it—it runs exactly on the dividing line between the vacant areas over here and the other properties. Now I would like to know where we are at without going into court.

ALEX. MCNEIL—If you include the whole Province we will know where we stand.

H. S. POOLE—I always flattered myself that I took one step that was good when I got the Government of the day (1874) to put in iron or stone permanent corner posts to coal areas. That suggestion was acted on and there has been no litigation since. But there have been some areas overlooked and stone posts have not yet been put in.

ANNUAL MEETING.

GEO. W. STUART—I would also move that the Committees appointed this morning to meet the Government be empowered to arrange with the executive of this Society with respect to the date of the next annual meeting.

CHARLES STARR—I second the motion.  
The motion passed unanimously.

PIT HORSES NEEDED.

Mr. POOLE called attention to a matter that should interest our horse-breeders and farmers. He said he desired to remind the society of the increasing demand for pit horses and the difficulty that increased as years roll on of procuring horses of suitable size and weight for use underground. Hitherto the provincial breeder had tended to produce either heavy animals for draft purposes or light-limbed stock for speed and action; and in these directions he had been encouraged by the general demand, by local agricultural societies and the prize lists at exhibitions. At the last meeting he Mr. Poole had brought up this matter and now suggested that the society express its views in a resolution that would call the attention of breeders of horses and others interested to this growing demand for a type of animal not hitherto receiving special consideration. In the past the average farmers' horse was undersized and hardly any difficulty was experienced in obtaining animals that suited in our coal pits. Now the tendency of the young farmer is towards the sulky and a trotter, to the progeny of pampered pedigree stock, very often to merely crossing the weeds left unold and accentuating the weaknesses of both parents. His horse is now softer than of old and less able to withstand the hardships, wet, cold, poor feed and neglect that the native endured with comparative impunity. The tendency of the exhibition horse is to limbs of length, a characteristic of no inconvenience on the surface where barn doors can be made of any size and the vault of heaven has a roof high enough to be out of the way; not so in the majority of our pits where the coal roof and the timbers inserted for protection restrict the height. What is wanted, Mr. Poole thought, for the average coal pit is neither beauty of form nor speed, but a horse that is low set, has weight, and has a quick walk. To advertise the type of horse required, perhaps this society would consider the desirability of offering a prize at the forthcoming exhibition in 1902.

Mr. POOLE moved, seconded by Charles Fergie, that a prize be offered. The motion on being put was passed unanimously.



ANNUAL MEETINGS.

The ANNUAL GENERAL MEETINGS of the MEMBERS of THE CANADIAN MINING INSTITUTE, for the Transaction of Business, the Discussion of Papers, &c., will be held in the

CLUB ROOM, WINDSOR HOTEL, MONTREAL,  
On Wednesday, Thursday and Friday, 5th, 6th and 7th March, 1902.

SINGLE FARE ON RAILWAYS.

Arrangements are being made whereby Members will be carried to Montreal and returned for a **Single Fare** on the Canadian Pacific, Grand Trunk, Intercolonial, Quebec Central, and Canada Atlantic Railways.

SPECIAL TOPICS FOR DISCUSSION.

In addition to a record programme of papers to be presented by the most eminent mining authorities in Canada, the following Topics have been slated by the Council for special discussion:—

GOVERNMENT AID TO MINING.

By Mr. JOHN E. HARDMAN, S.B., M.A.E., Montreal, Que.

COMPRESSED AIR.

By Mr. W. L. SANDERS, New York, N.Y.

COLLIERY VENTILATION.

By Mr. CHARLES FERGIE, M.F., Westville, N.S.

POWER DRILLS.

By Mr. C. C. HANSEN, Montreal, Que.

HAULAGE.

By Mr. WM. BLAKEMORE, M.E., Montreal, Que.

PUMPING.

By Mr. JOHN P. NORTHEY, Toronto, Ont.

Syllabus of papers and detailed programme of arrangements will be sent to members in due course.

CHARLES FERGIE, *President.*

B. T. A. BELL, *Secretary.*

FOR SALE.

Valuable Mining Property

AT NORTH BEND, B. C.

TENDERS will be received by the OTTAWA HYDRAULIC MINING AND MILLING COMPANY, LIMITED LIABILITY, addressed to the undersigned, up to Monday the 6th day of January, 1902, for the purchase of their mining property and water rights at North Bend in British Columbia and which may be known as that piece of ground situate at Boston Bar on the east side of the Fraser River and formerly known as mining ground leased to John Webb, containing sixty-four acres, more or less, and the grant of water right to use five hundred inches of water out of Four Mile Creek, opposite Lyons Ranch, near North Bend, together with a flume about four miles long, extending from Four Mile Creek to the mines of the Company.

There is situate upon the mining land a portable sawmill, two monitors, a large quantity of iron piping, and also mining tools and supplies which will be sold with the mine property.

The Vendors are not to be bound to accept the highest or any tender.

For particulars apply to WILLIAM C. MCGILLIVRAY, New Westminster, B.C., or to the undersigned.

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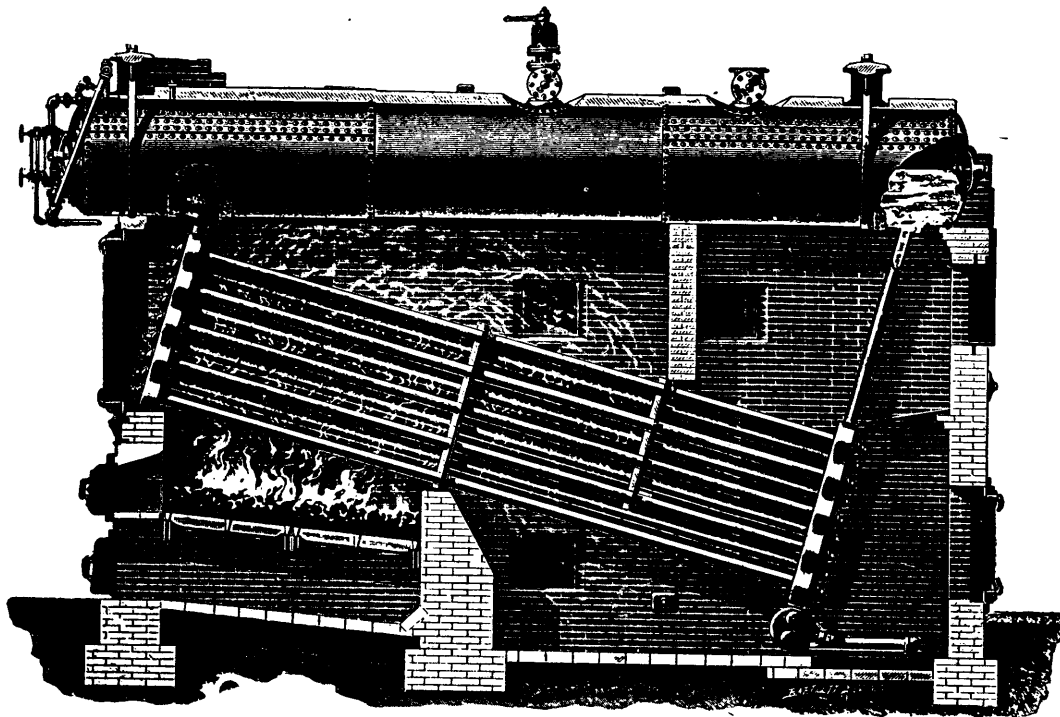
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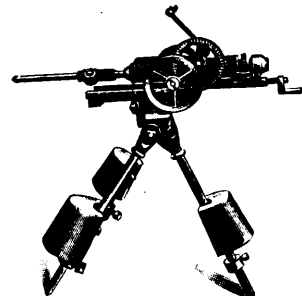
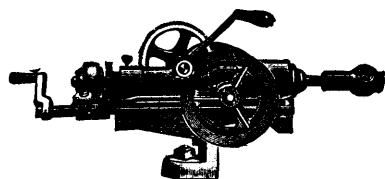
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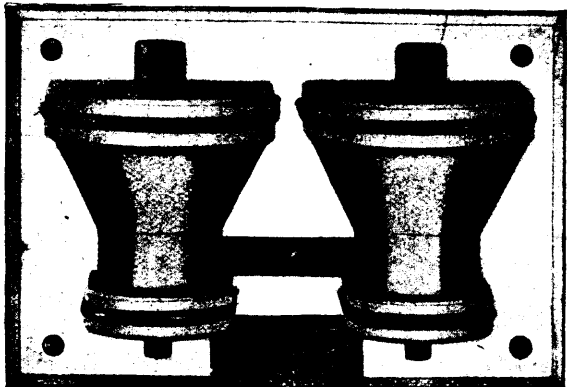
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Up to date particulars of the Organisation, Equipment, Operations, Output, Balance Sheets and Dividends of all Canadian

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### THE CANADIAN MINING REVIEW

OTTAWA, CANADA.





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

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

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

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

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

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

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

**HONORABLE E. J. DAVIS,**

Commissioner of Crown Lands,

or

**THOS. W. GIBSON,**

Director Bureau of Mines,

Toronto, Ontario.



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

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

**GOLD AND SILVER.**

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

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

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

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

**MINES OTHER THAN GOLD AND SILVER.**

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

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

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

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

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

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

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

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

# PROVINCE of QUEBEC

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

## GREAT MINERAL TERRITORY

Open for investment in the Province of Quebec.

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

ORNAMENTAL AND STRUCTURAL MATERIALS IN ABUNDANT VARIETY.

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

Mining concessions are divided into three classes:—

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

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

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

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

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

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

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

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

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

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

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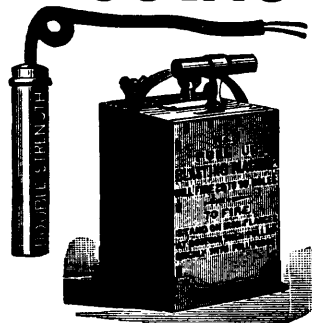
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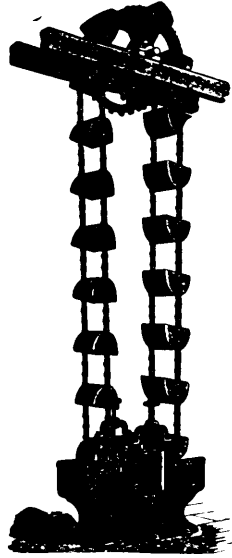
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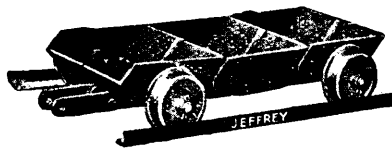


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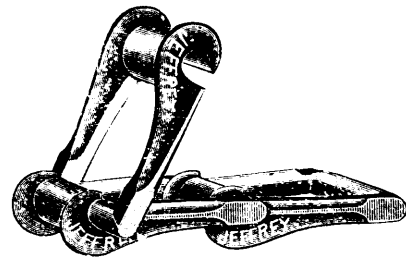
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