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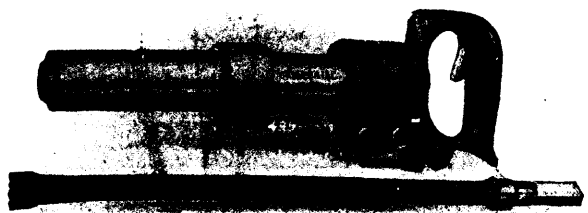
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MONTREAL, DECEMBER, 1905.

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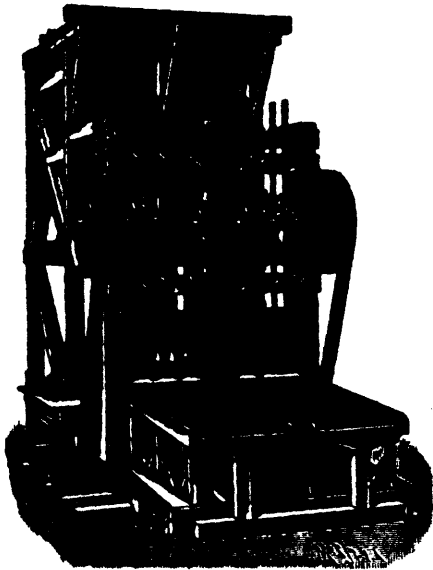
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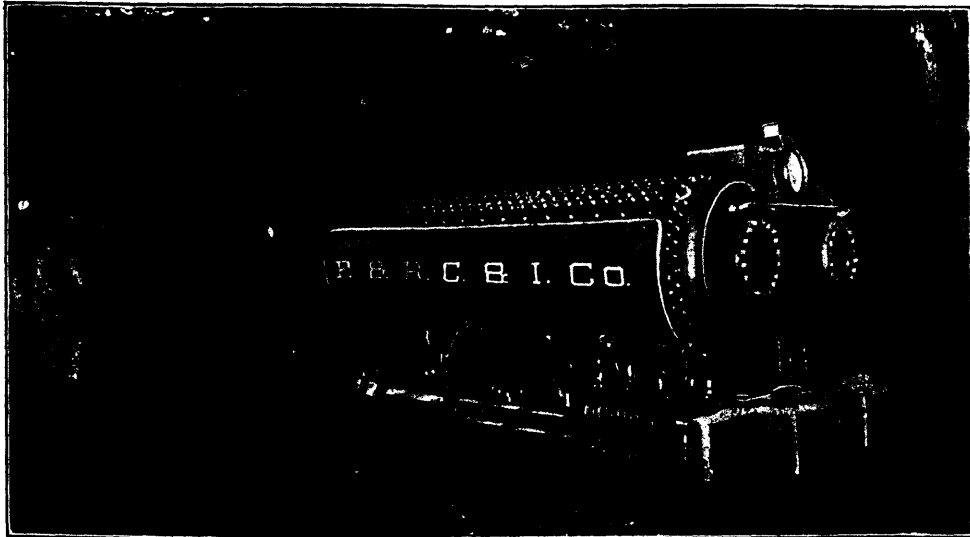
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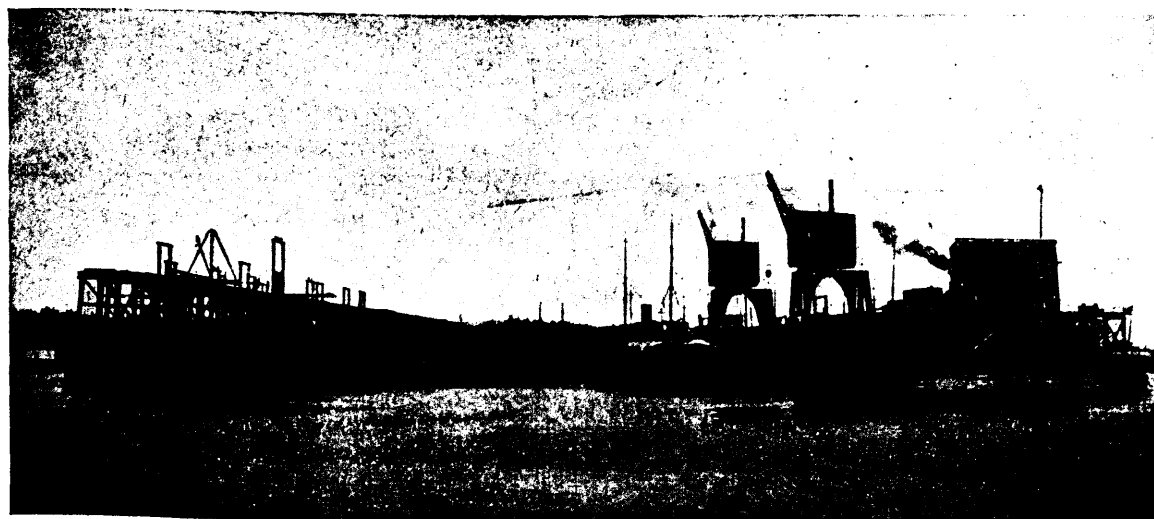
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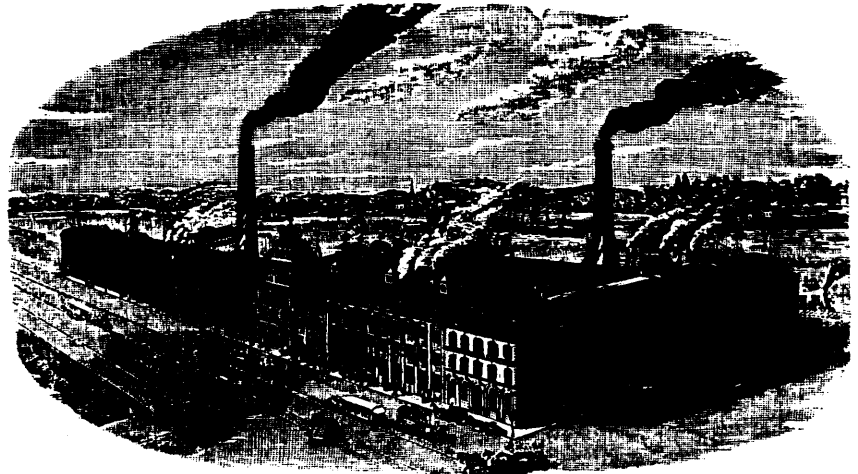
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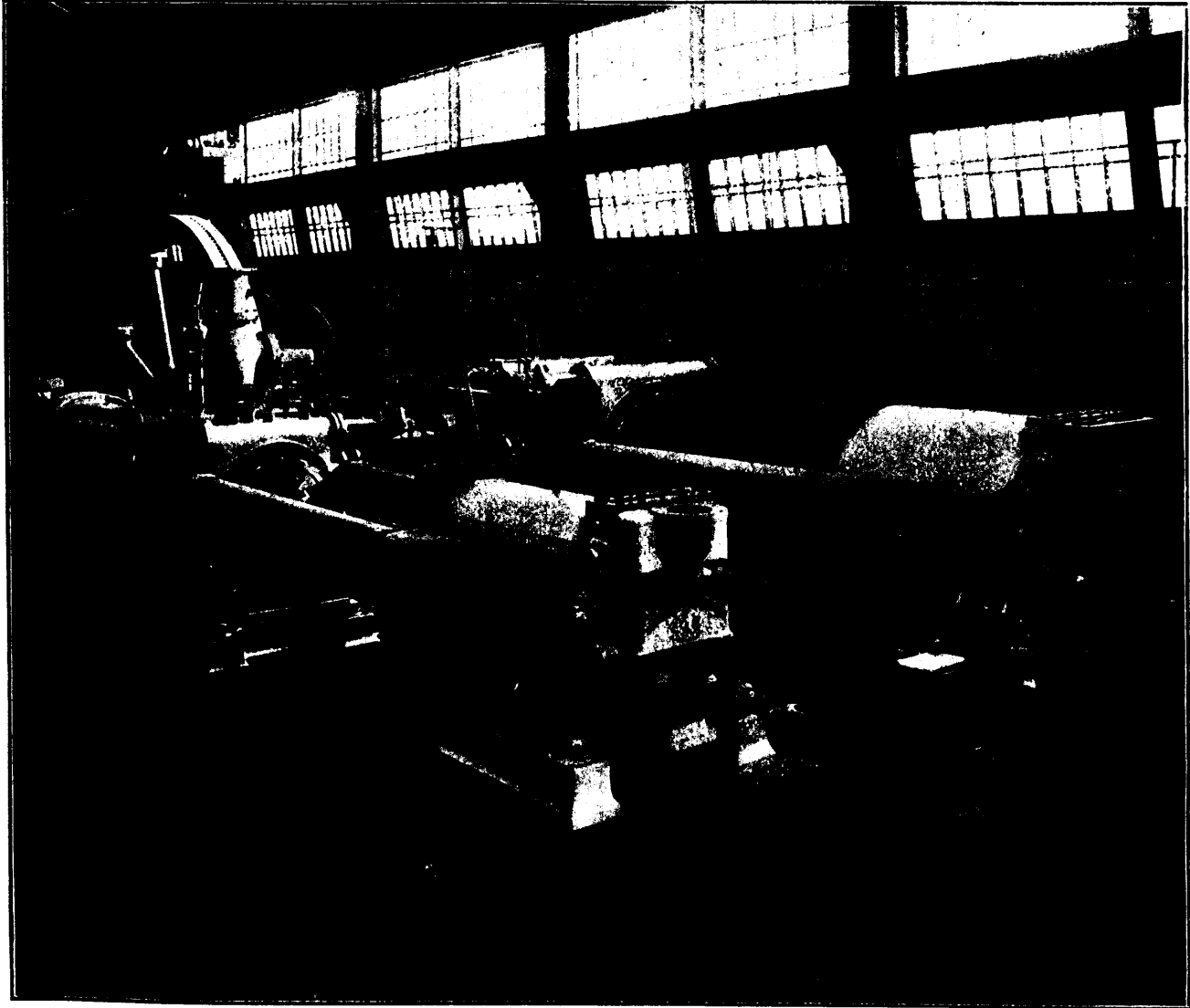
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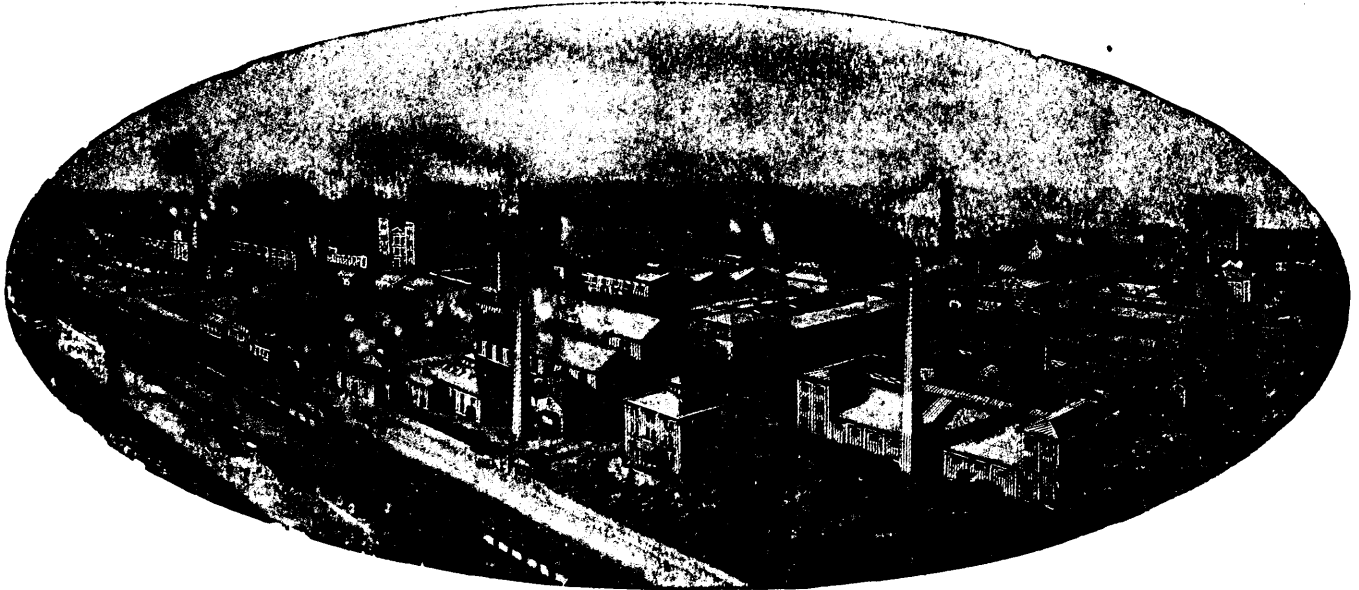
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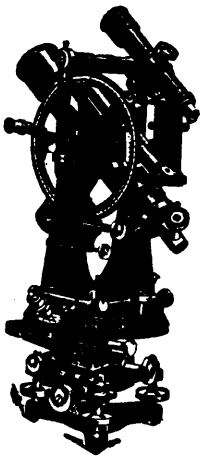
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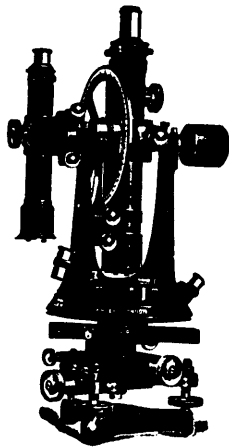
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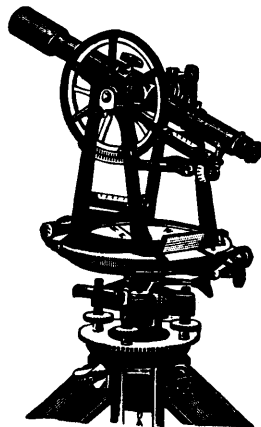
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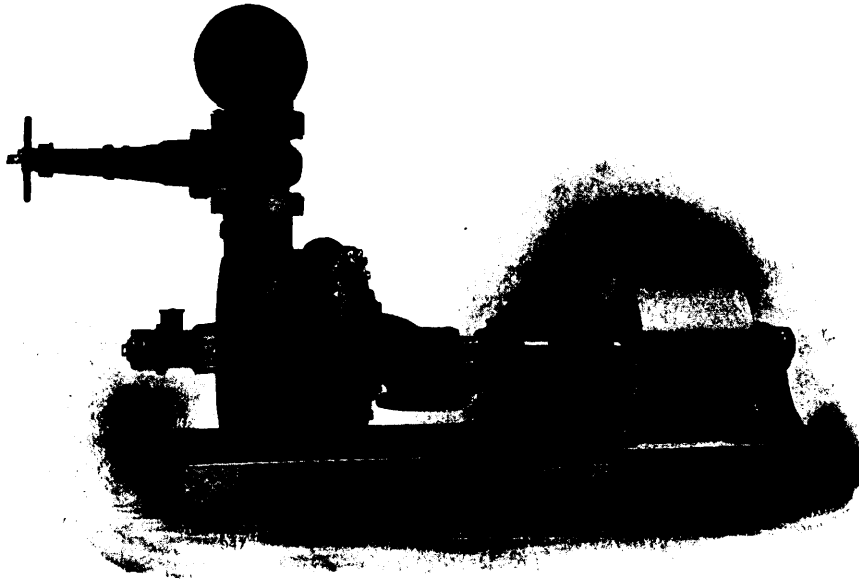
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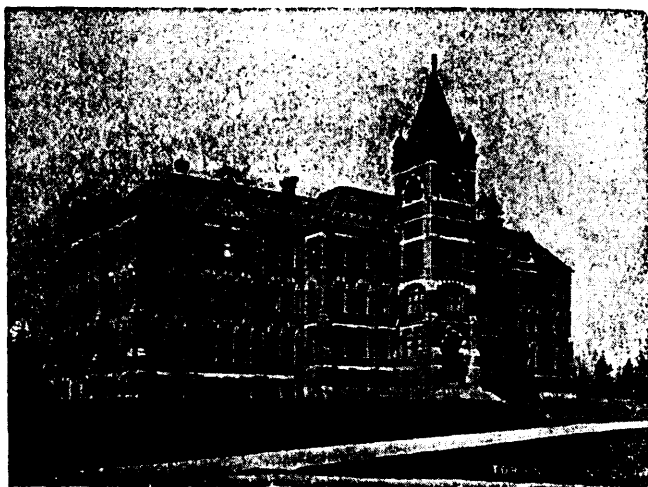
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Incorporated by Act of Parliament 1898.

#### AIMS AND OBJECTS.

(A) To promote the Arts and Sciences connected with the economical production of valuable minerals and metals, by means of meetings for the reading and discussion of technical papers, and the subsequent distribution of such information as may be gained through the medium of publications.

(B) The establishment of a central reference library and a headquarters for the purpose of this organization.

(C) To take concerted action upon such matters as affect the mining and metallurgical industries of the Dominion of Canada.

(D) To encourage and promote these industries by all lawful and honourable means.

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

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

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Vol. I, 1898, 66 pp., out of print	Vol. V, 1902, 700 pp., bound.
Vol. II, 1899, 285 pp., bound red cloth	Vol. VI, 1903, 520 pp., bound.
Vol. III, 1900, 270 pp., bound red cloth	Vol. VII, 1904, 530 pp., bound.
Vol. IV, 1901, 333 pp., bound.	

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

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

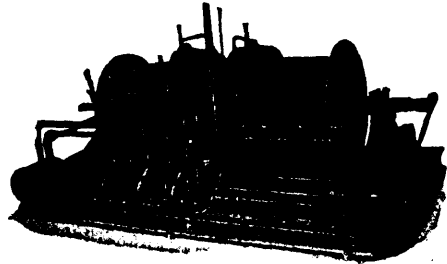
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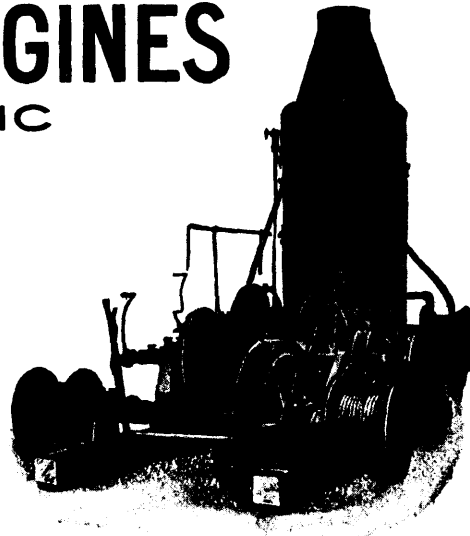
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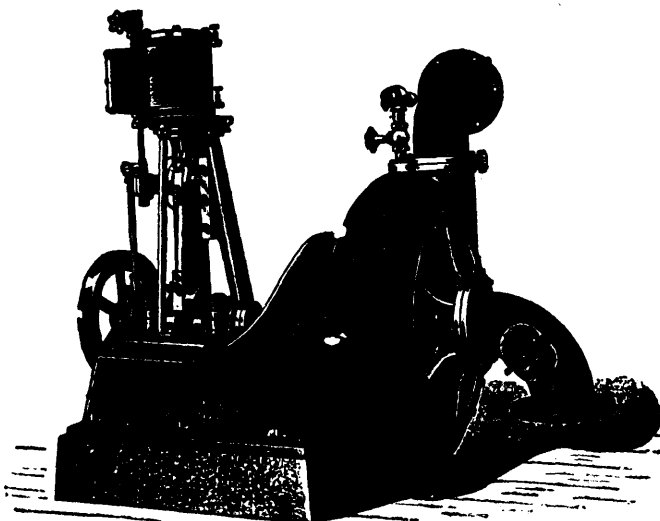
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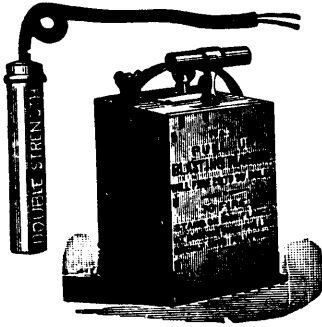
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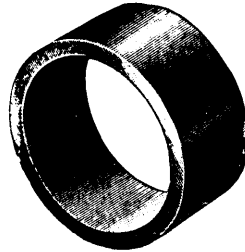
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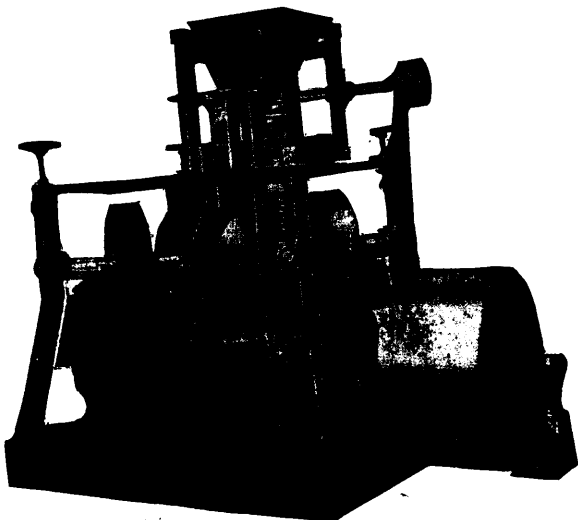
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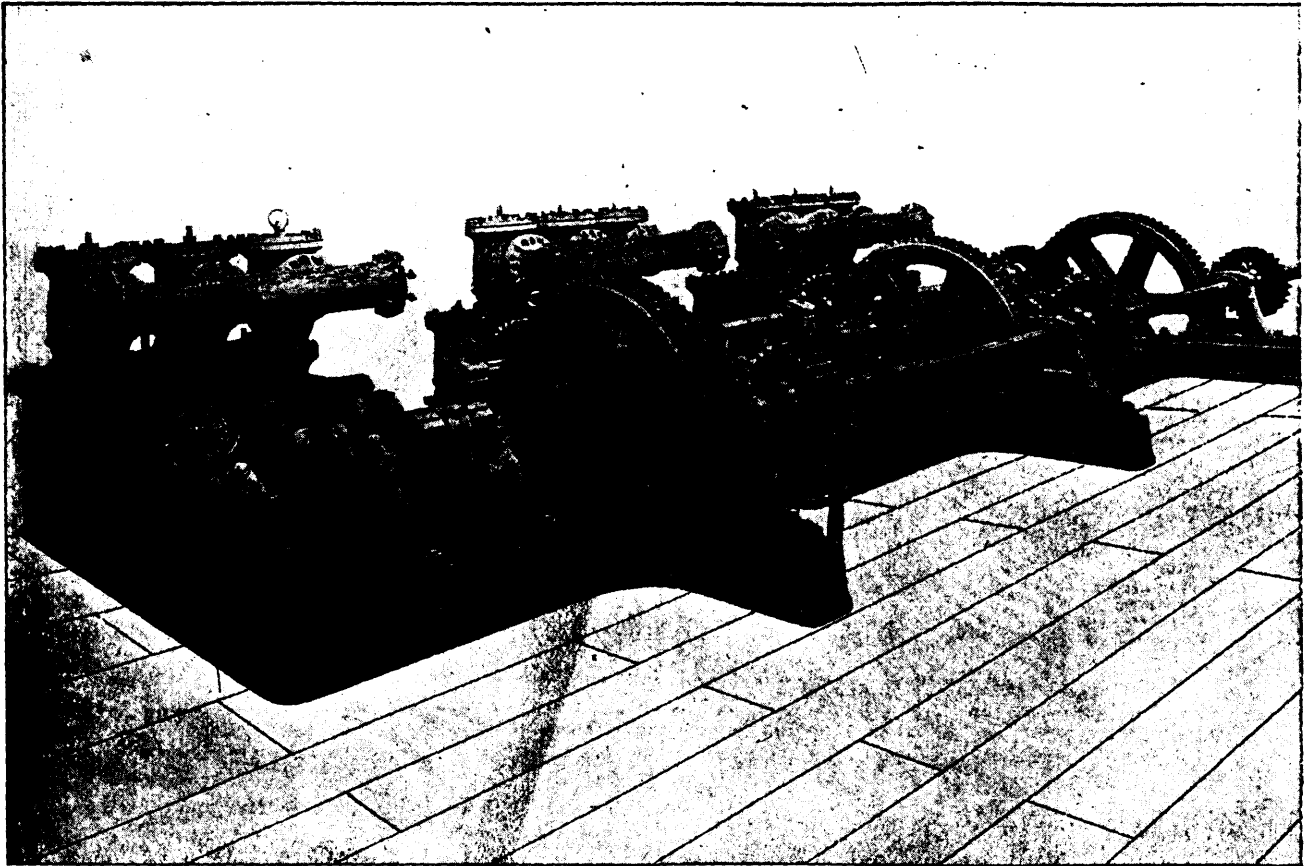
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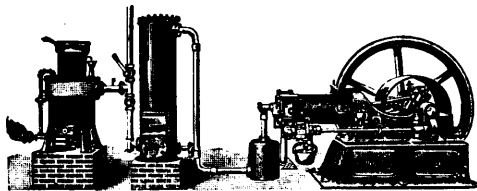
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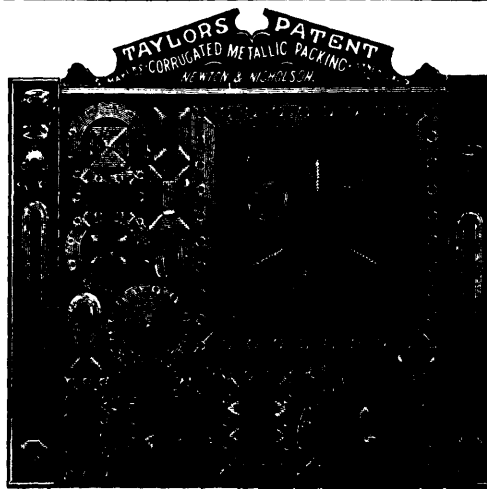
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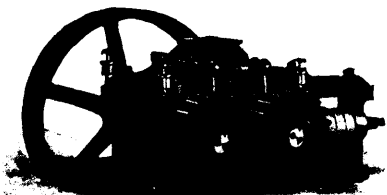
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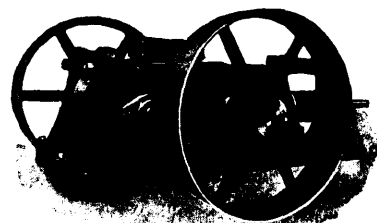
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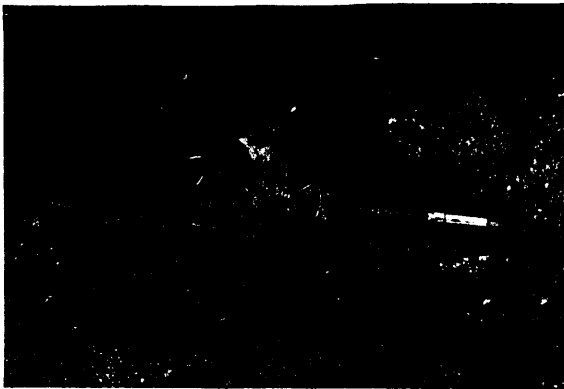


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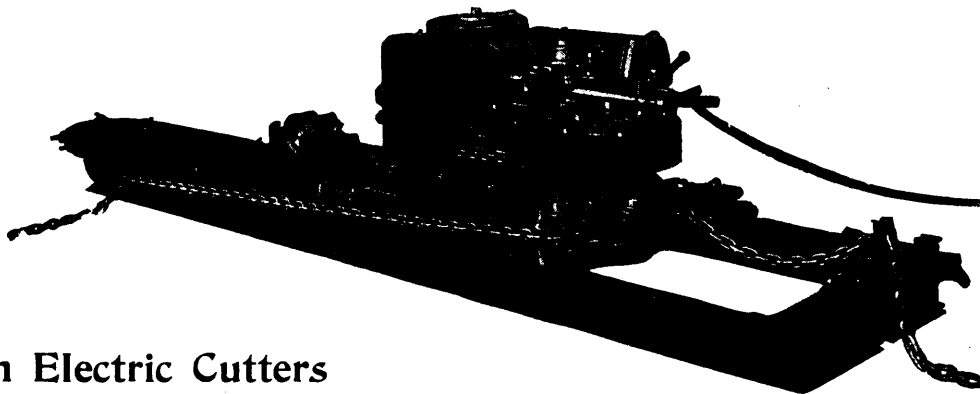
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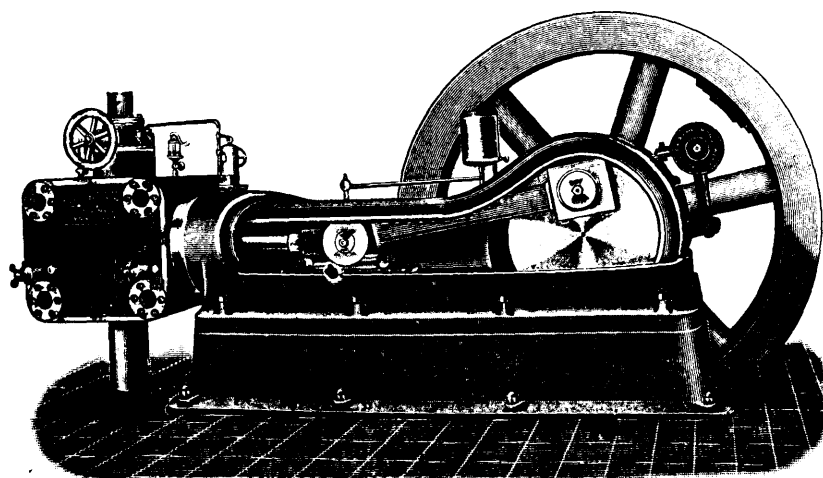
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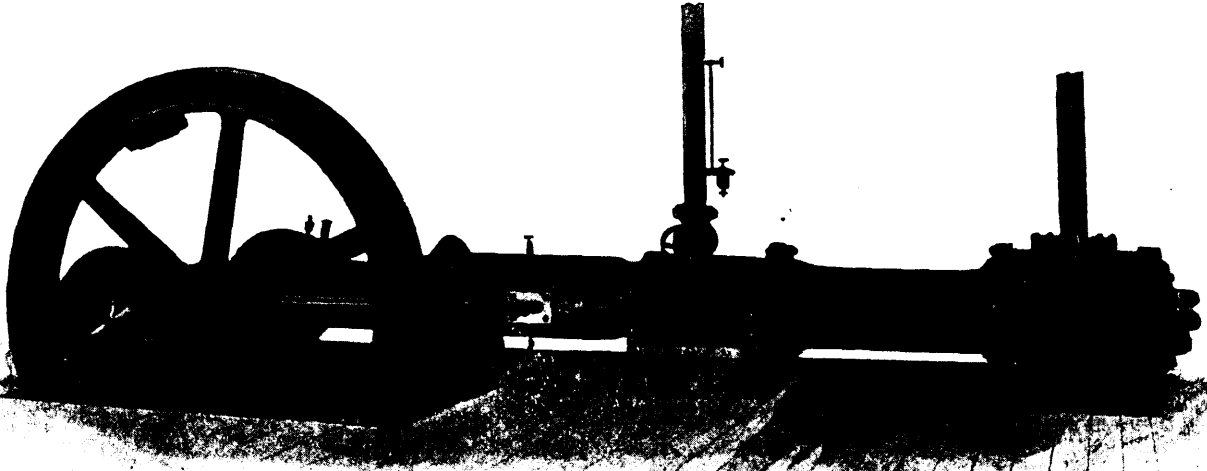
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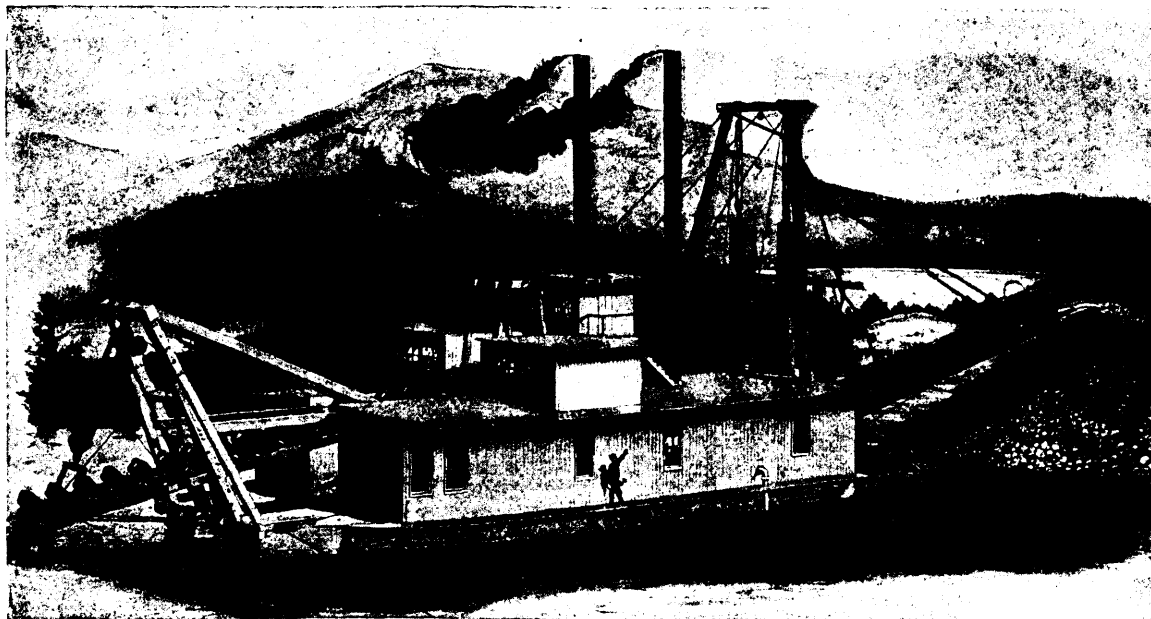
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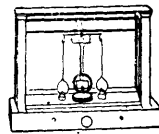
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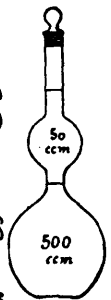
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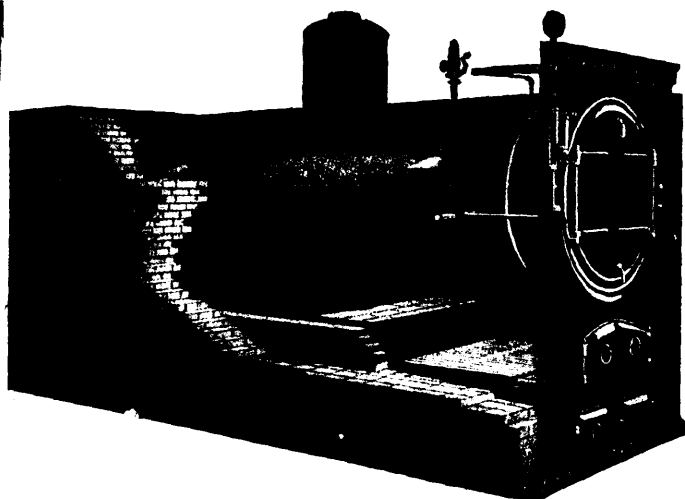
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# THE CANADIAN MINING REVIEW

Established 1882

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It now turns out, according to a statement made in an interview with the *Rossland Miner* by Mr. F. C. Winkler, representing the Canadian Oil Company, in the Kootenays, that the much heralded striking of a "gusher" on the Rocky Mountain Development Company's property at Pincher Creek, was a fabrication, manufactured out of whole cloth, made and circulated solely for stock jobbing purposes. Whether Mr. Winkler's information is correct or not, the public should always remember, when asked to believe any statement in connection with oil discoveries, that while "natural gas" may in one sense, be a sufficient indication of the presence of oil, it isn't always in another.

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We call attention to the interesting argument of Mr. J. M. Clark, K.C., of Toronto (in what is known as the Gates lease case) published in this issue. We are exceedingly pleased to learn that the Ontario Government have given effect to this argument and have dismissed the application for a fiat to attack this lease in the Courts. This decision, which is along the lines of policy advocated by the MINING REVIEW will commend itself to the mining community generally. Mr. Clark, the successful counsel in this case, is one of the authors of "The Law of Mines in Canada," a valuable work which should be specially studied by mining men at the present time in view of the proposed revision of the mining laws of Ontario.

We commend to the attention of our Ontario readers "J.B.'s" interesting letter published in another column on the subject of the proposed revision of the mining law in that Province. We do not endorse all the views of our correspondent, but the communication nevertheless contains numerous valuable suggestions, written by a man who has a large experience and knowledge of the subject anent which he writes. A special feature of this issue, also, is an article contributed by Dr. R. W. Raymond, the well-known specialist and authority on mining law, wherein "the requirements for a possessory mining title" is ably discussed. This article is published in the hope and belief that it will prove of use to the delegates attending the Toronto Convention to be held on Dec. 12th.

The report which originated in British Columbia, that a sale of the Consolidated Cariboo Hydraulic had been made to Messrs. Guggenheim, is altogether premature, although it is true, negotiations are now in progress. It is understood that should the transfer be completed, Mr. J. B. Hobson will continue to be retained as manager of the mine.

The market for the ores coming from the Cobalt district in New Ontario has been so uncertain and so small during the last six weeks as to have caused considerable anxiety to the owners of property in that

section. We understand that a general meeting of the owners of producing mines was held at Cobalt on the 16th of November, where the difficulties in the sale of ore were thoroughly ventilated and discussed, and the matter of future sales and of united action on the part of the producing mines, was intrusted to a committee, for full investigation and subsequent report. It is to be hoped that the question will be satisfactorily solved, and in a manner which will be beneficial to the mine owners, as it would not only be detrimental to Ontario, but to Canada as a whole, should there have to be any curtailment of production from this district by reason of diminished markets. Incidentally, we are informed that the whole difficulty arises from the complex metallurgical problem, which is presented by the composition of these ores. Concerning the solution of this problem there are many proposals, but we have yet to learn of one that is accepted as a certain solution of the question.

Mining men generally throughout Ontario have availed themselves of the opportunity afforded by the meetings called by the Division Inspectors, to discuss the present mining laws and to suggest amendments thereto, and during the past few weeks interesting meetings have been held at Sault Ste. Marie, Sudbury, Cobalt and other mining centres for this purpose. Upon many questions at issue these meetings have not been in accord, nor could agreement have been expected in all details; but in the main there has been unanimity in the demand for a fixed statute which shall not be amenable to frequent and unnotified changes through the issuance of orders-in-council. In respect to the validity of locations there has also been a general declaration in favor of the view which the letter of the present Act demands, namely, the right of the locator to undisturbed possession for a certain period during which he must find mineral in place, failing which he must surrender the right to exclusive possession. Opinion, also, appears to be unanimous in that only work performed should be permitted to hold a mining claim, and that no money payment should be allowed to commute or replace the labor equivalent. In upholding this view the mining men should have the sympathy and support of all who are desirous of seeing the mining industry flourish and go steadily forward. A point made in a leading article in our issue of last month has been endorsed by every meeting so far held, and that is, that there must be one law, and one only, for the whole Province, and that to frame regulations for one Mining Division which differ from those framed for another Mining Division, is a wholly undesirable state of affairs, which should be remedied in revising the present Act.

We have devoted much space in this issue to reviewing the two monographs just published, on, respectively, Asbestos and Mica, by the Mines Branch of the Department of the Interior. Both of these reports contain a mass of valuable information, and while, perhaps, if one were inclined to be captious, it might be urged that some unnecessary "padding" could advantageously, for the sake of conciseness, have been omitted, this defect, if it may be so termed, is an error on the right side rather than otherwise. In this connection we take the opportunity of offering our congratulations to the Superintendent of Mines, Dr. Eugene Haanel, for the work accomplished by the Mines Branch, under his direction, this year. In the past, it will be admitted, mining has not received from

Government its fair share of assistance and encouragement which its importance as a Canadian industry has warranted, but Dr. Haanel has already shown what can be done even with the limited facilities at his command. It is surely a beginning, but a beginning in the right direction. The electro-metallurgical experiments at Sault Ste. Marie may or may not prove economically valuable, but to question the practical utility of the tests before the results are arrived at is, at the least, premature, while their is no gainsaying the fact that the work initiated by the Branch along these lines is attracting the widest attention of scientific men throughout the world, and thus stimulating interest in the country and its mineral resources. In addition, too, three bulletins have been issued during the year, while all the arrangements in connection with the work of the Zinc Commission in British Columbia were made by the Mines Branch. That is one side of the shield; the other is not so satisfactory. We fear it is already well known that if not friction, at least there is a lack of cordial feeling between the Mines Branch of the Department of the Interior and the Geological Survey, which is also a section of the Department of the Interior. Thus when the Mines Branch issued the monographs on Asbestos and Mica, the Geological Survey immediately issued bulletins on the same minerals; or vice versa, it really doesn't matter which—except that the Geological Survey bulletins suffered somewhat in the comparison. But the absolute futility of this sort of thing must be apparent, and it is high time that it ended. Instead of antagonism, there should be harmony and co-operation, and surely an arrangement is possible by which this more satisfactory state of affairs might be brought about, for there is ample scope and work for both institutions. But the sooner the present chaotic condition of affairs in connection with the administration of the Geological Survey and other matters is settled the better for all concerned.

### THE PRINCIPLE GOVERNING INITIAL TITLE TO MINERAL LAND.

By DR. ROSSITER W. RAYMOND.

While I cannot pretend to possess such a personal knowledge of the new Temiskaming mining district in Ontario, the conditions of its industrial development, or the history and reason of legislative or executive regulations thereof, as would warrant me in the expression of a deliberate opinion or of detailed criticisms and suggestions, I have been much interested in the situation, as indicated in the columns of the CANADIAN MINING REVIEW; and I venture to offer a few remarks concerning one general principle, which seems to me to be involved.

*What proof of a valuable "discovery" should be required from a prospector upon public lands, as a basis for "possessory title?"*

In my judgment, the less, the better. The difference between the constitutional attitude of the United States Government towards its mineral lands and that of the Dominion, or of any Province of Canada, need not be discussed here. I am convinced that any modern government, whether State or Federal, owning mineral lands, and seeking to promote their development, whether in the general interest, and whether for the purpose of outright and unreserved sale, or of direct or indirect revenue, should specially encourage attempts to develop unpromising mineral territory.

If those claims only which offer good prospects at the beginning are recognized as entitled to possessory occupation, the inevitable result will be that, after all the "good things" have been thus appropriated, the Government will be left with the less inviting remainder on hand.

In discussing our United States law, I have gone so far as to advocate not only the recognition of locations, but even the sale of mineral land outright, without any proof whatever of a "valuable" discovery. But this extreme position need not be regarded here. The present practice under our Federal law is, that the Government raises no question concerning the validity of a location until the locator asks for a survey, as the first step of proceedings for purchase. The application for official survey is not made under oath. It may be signed by the applicant or his attorney, must contain the particulars of the situation of the claim and the title (by original location or by assignment) of the applicant, and must be accompanied by certified copies of the original (unsworn) location notice, and all later recorded amendments thereof. It will be seen that, so far, the locator has never made oath to any "discovery." On that point, he has simply given, in his original notice, a statement which, under the circumstances, can be regarded as only the declaration of his opinion that he has discovered a "lode." Under this initial declaration, he may hold his claim, unchallenged, for any number of years, provided he annually performs, upon the location, work to a certain amount, fixed by State or local authorities, but not less than the minimum fixed by the Federal statutes. Compliance with these conditions is deemed to be *prima facie* proof of the good faith of the locator, and of his continued belief in the prospective value of his discovery; and the longer the period during which he has satisfied the annual and other requirements attached to his possessory title, the stronger is the force of this *prima facie* proof.

Nevertheless, it constitutes only a legal presumption, subject at any time, prior to final sale by the U.S., to be overthrown by adequate contrary evidence. The question may arise through a conflict between two locations (both held under possessory title only) or between a location for which a patent has been applied and a prior location not yet the subject of such an application. Or a homestead or town-site may thus contest the validity of a mining location, occupying part of its territory. In such proceedings, the burden of proof is upon the challenger of the prior location, to show that it was not based upon a valid discovery. A patent of the United States, issued according to law for a given mining-claim, cannot be "collaterally" attacked; that is, its validity must be assumed in any proceeding except one, namely, a suit brought *ex relato* by the Government itself, to have the patent set aside, on the ground of fraud or illegal action.

It will be seen that, during the period of "possessory title," full opportunity is given for the assertion of the rights of other citizens, adverse to those of a locator, but as between the locator and the Government, the good faith and validity of his location are practically assumed. It should be added, however, that our Government is more liberal concerning its own claims than concerning those of its citizens. In the absence of any adverse claim, a patent may be properly issued upon less conclusive proof than would be required if the case were contested.

But while the validity of the U.S. mineral-land patent cannot be collaterally questioned, the extent of its grant is open to such inquiry at any time, and

can never be regarded as *res adjudicata*. For it conveys vague "extralateral rights" outside, and withholds similar rights inside, of the granted tract. These rights are obscurely and precariously contingent upon the course of the lode upon which the location was made, although they effect all other lodes "apexing" within the tract. The lode-locator, therefore, fixes the boundaries of his claim at his own peril. To secure the maximum advantage, he should ascertain the course of the discovered lode, and lay out his claim parallel therewith. Later changes of boundary are subordinate to the intervening rights of others. This requirement involves, inferentially, some knowledge of a lode; and consequently, we find that application for patent, after the official survey, must be made under oath, and must contain a declaration of a lode-discovery (though without any statement of its value); also, that the survey submitted therewith must indicate the point of discovery and the course of the lode—these particulars, however, being necessarily stated by the surveyor on the authority of the applicant. This is the first occasion on which the possessory owner (in the absence of any contest with other citizens) is required to make any oath whatever; and this oath, if not challenged, is regarded by the Government as a sufficient basis (other legal formalities and conditions having been satisfied) for the absolute and final transfer of all its rights in the tract described. If our Government did not, by such issue of a patent, surrender completely its ownership of the land and its mineral contents, its liberality in this respect would be certainly not less wise.

My cordial condemnation of the "extralateral rights" embodied in the U.S. statutes governing the sale of public mineral land, and my frank preference and advocacy of the principle of "square locations," that is to say, of the boundary of underground mining rights, of whatever kind, by vertical planes drawn through the surface-boundaries (according to the laws of Canada, Mexico, and, I believe, of all other civilized countries, outside of a limited part of the United States) is sufficiently well-known, I reiterate it here, simply in order to point out that this lamentable feature of our statute does not impair, but rather enhances, the force of my present argument.

The requirement, at any stage, of a sworn statement from a mining locator can only be based upon the legal responsibility involved therein—in other words, upon his liability to criminal prosecution for perjury, if he has sworn falsely. Now, such a sworn statement, made at the time of first location, could practically never be proved a perjury. A case is, of course, conceivable, in which a scoundrel might make a location upon utterly non-mineral land, upon which he had not found even a specimen indicating a mineral deposit. But frauds of that character are very rare, easily detected, and amply covered by the criminal law. What practically always happens is that the locator has found something which he professes to regard as part of a mineral lode. If he is a rascal, he takes all the more pains to make such a discovery, and to preserve proof of it. Hence, his oath merely certifies to his opinion that what he has discovered is a mineral deposit, such as the law requires as a basis for his location; and it cannot possibly be proved, except by his own confession that he did not honestly hold that opinion. Consequently, as I have already observed, I do not think an oath should be exacted from the prospector and locator at the first stage of his work.

But, if an oath be required, it is the height of superfluous unwisdom to require also the confirmation



thereof by the opinion of a Government inspector. The reasons for this opinion are so many that I cannot mention them all. Mining inspectors are not necessarily thorough economic geologists, competent to decide whether a surface-opening shows a lode of actual or prospective value. The most eminent of such experts could not make that decision with certainty, and would be, in other respects, very poor inspectors. And every one of them, if I may judge from my own field-practice of forty years, would frankly regard as, in some respects, superior to his own judgment, that of the practical miner who had "stayed by" his claim, watched its developments and minute indications continuously, and put his faith in it. Such an expert would be inclined to say to a prospector, at worst, "My friend, I don't see, as yet, any proof that this hole of yours is going to develop a bonanza for you. But all the great mines of the world have been discovered by men like you; and so long as you hang on, you shall not be stopped by any opinion of mine."

The chances are that an honest inspector would say the same, unless he observed clear indications of fraud. But such indications he would not observe; for fraudulent operators do not leave them lying about, to be detected at a glance. If the inspector himself were not honest or competent, of course his opinion would be valueless. If unfavorable, it would either be contested at heavy expense, or accepted with serious injury, to the prospector. And those who could afford to fight it would be the speculators, while those who must submit to it would be the poor but enthusiastic prospectors. On the other hand (and this is, perhaps, the most important consideration of all), a favorable report from the inspector, however obtained, would practically transfer to him the responsibility of the locator's declaration, and forever protect the latter against prosecution for false swearing. It is difficult enough to convict one man of perjury. The difficulty of convicting two is at least four times as great.

The deduction is self-evident. Either require no supplementary official opinion upon an alleged "discovery," or else require no oath from the discoverer, and leave the facts to be determined by official reports exclusively.

The unwisdom of the latter policy would be recognized by all mining engineers acquainted with the history of the development of mineral resources on either side of the International Boundary. It would harass a hundred honest prospectors, in the fallacious hope of detecting a single swindler, thus discouraging the one branch of enterprise which must needs be encouraged, and which promises most for the future prosperity of the State.

Questions of the taxation and regulation of the mining industry are indeed important, and may be solved wisely or unwisely. But before the mineral resources of a country can become the subject of such questions, they must be discovered; and this must be accomplished through the enthusiastic enterprise of individual explorers. For this particular and peculiar industry lives upon hope; receives, on the whole, scanty remuneration; and needs every possible encouragement. Whatever else is done or left undone, no unnecessary annoyance or burden should be laid upon the mining prospector. The notion that the Government should say to him, "We do not think you will succeed; therefore we will not let you try!" is self-evidently absurd. Let other remedies be provided, if necessary, for anticipated evils—not this!

New York, Nov. 24th, 1905.

### THE NEW GENERAL MANAGER OF THE DOMINION IRON & STEEL CO., Limited.

Mr. Frank Percy Jones, recently appointed General Manager of the Dominion Iron & Steel Co., Limited, is one of our young Canadians who promises to maintain the traditions of this country as the birthplace of "men of parts," as they say in Scotland.

Mr. Jones is the son of Mr. Chilion Jones of Brockville, therefore born to be a manufacturer and a hustler. After passing through the Brockville High School, now the Collegiate Institute, Mr. Jones took the Engineering Classes in the Royal Military College at Kingston. Leaving there in 1888 he spent the next five years in the works of the D. F. Jones Manufacturing Co., Limited, of Gananoque, giving about equal attention to the practical work of the mills and shops and to the general business of the concern.

During 1893 Mr. Jones was employed in the shops of the Canadian General Electric Co. at Peterborough, Ont., and on the 1st of January, 1894, joined the staff of the Nova Scotia Steel & Forge Co., Limited, as salesman. His success in that position brought him to the notice of the management of the Dominion Iron & Steel Co., when they were organizing their Sales Department in 1901, and he was enlisted in its service. Mr. Jones was appointed Assistant General Sales Agent in 1902, and in June, 1903, on the retirement of Mr. Buell, was made head of the Department.

In addition to developing the business of the Company with the various consumers of pig iron and steel in Canada, Mr. Jones has devoted especial attention to the study of the tariff in its relation to the Iron and Steel industries. His grasp of this subject is remarkable, and his opinions are respected even by those who differ from his conclusions.

After the dissolution of the connection between the Dominion Coal Co., Ltd., and the Dominion Iron & Steel Co., Ltd., and on the election of Mr. J. H. Plummer to the Presidency of the latter company, Mr. Jones became closely identified with the general management of its affairs, which was undertaken by the President on the retirement of Mr. David Baker, as General Manager, which office then became vacant. In addition to the direction of the Sales Department Mr. Jones undertook the supervision of the Purchasing and Warehouse Department, and also had charge of all the Company's traffic arrangements, chartering and managing its ships, and directing the operation of its Railway and Dock system. In the absence of the President Mr. Jones acted for him in all matters of general business.

His recent promotion to the Management of the Company's affairs is therefore in the way of natural development, and is an unmistakable evidence of appreciation of his fitness for the position.

In the practical operation of the various parts of the Company's works, which for the past two years have been under the direction of Mr. Graham Fraser, Mr. Jones will be assisted for the present by Mr. C. H. MacMillan, formerly with the Tennessee Coal & Iron Co., and the English Westinghouse Co. of Manchester.

### GRAPHITE MINING AND CANADIAN POSSIBILITIES.

There appears at present to be a very brisk demand for crystalline graphite, both American and English dealers having visited this country lately with the



MR. FRANK PERCY JONES,  
New General Manager, Dominion Iron and Steel Co.

object of investigating graphite properties and working them for themselves. The enormous expansion of the steel and iron industry, both on the North American continent and in Europe, calls for a larger production of flaky graphite than usual, on account of the manufacture of graphite crucibles. It is reported that several large steel firms in the States, in Germany and in England are using the amorphous variety in the manufacture of some crucibles, owing to the irregular and insufficient supply of flaky material. Crystalline graphite for the most part is now produced on the Island of Ceylon; it is also produced in (Bavaria), in the State of New York and also in parts of Canada.

Canada has long been known as affording graphite of the flake variety; it possesses large deposits of this material in the Provinces of Quebec and Ontario, which, in extent and quality, are equal to those of New York State and Bavaria. In order to appreciate the possibilities of a Canadian graphite industry it may be mentioned that in New York and Pennsylvania crystalline graphite deposits are mined on a large scale which contains only 4% graphite, while the Canadian deposits carry from 7 to 20%, and offer in this respect a greater advantage for profitable mining than the United States deposits. The mines in New York owe their success to the methods of cleaning material in the mills.

Some years ago people ventured to predict a downfall of the natural graphite industry owing to the successful manufacture of artificial graphite at Niagara Falls, and it was even predicted that in a few years time a number of prominent mines in the United States and Canada would have to go out of existence. Nothing of the kind has yet happened and, while it is true that artificial graphite (of the amorphous kind) is suitable for certain purposes of manufacture (such as stove polish, foundry facings, paints, etc.), it is equally true that the crystalline variety, which is used so extensively in the manufacture of crucibles, cannot be made artificially, and, according to an expert, it is not likely that it ever will be.

The increase in the world's production of natural graphite for the last seven years has been very large; in 1897 it amounted to a value of \$1,900,000.00; in 1904 it was, approximately, \$4,500,000.00, and in 1905 it will very likely exceed \$5,000,000.00.

That Canadian crystalline graphite is equal to the best Ceylon product has been demonstrated by Dr. Carl Bischoff of Wiesbaden, Germany, the well-known expert on fireclay and refractory materials, and it has also been shown by Dr. Hoffman, of the Geological Survey at Ottawa, in a series of tests made in the year 1877.

The most practical proof is, undoubtedly, the actual manufacture of graphite crucibles from Canadian graphite by such firms as The Morgan Crucible Co., of London, England, Gauthier & Co., New York, and several German manufacturers. About 32 tons of refined flake graphite, coming from the Calumet graphite mines, have been so employed and the results have been so satisfactory that a large tonnage of the material could be sold. There is no doubt that with ample capital, careful and expert management, many Canadian graphite properties can be brought to a profitable state of production, and it is to be hoped that Canada will see, in the near future, a great expansion of the graphite industry commensurate with its extensive natural resources.

## THE ANNUAL REPORT OF THE HALL MINING AND SMELTING COMPANY.

During the month of November the printed report of the Annual General Meeting of the Hall Mining & Smelting Company was distributed to shareholders and others, and we summarize the essential features of the report for the benefit of our readers.

The directors' report is interesting inasmuch as it reveals the understanding between the Board and Mr. M. S. Davys, respecting the lease of certain portions of the property which has been renewed for a long period. This agreement between the Board and Mr. Davys began on the 16th of November, 1904, and will terminate on the 30th of June, 1907. Under this agreement Mr. Davys bears one half of all costs incurred, and gets one half of the net profits received, but gives his services without further consideration. We may remark in passing that although this agreement has been criticized by some few Canadian shareholders, as unduly favourable to Mr. Davys, we take an entirely different view, believing that but for Mr. Davys' intimate personal knowledge of the various properties on Toad Mountain, the Company would to-day be closed as an ore producer, and would be simply smelting ores purchased in the open market of British Columbia.

At the beginning of the financial year all the ore which could be mined without lowering the water below the level of No. 5 tunnel, had been extracted by Mr. Davys, and his lease had been surrendered. Mr. Davys visited England during the summer of 1904, and discussed with the Board the project of lowering the water to the 7th level, that the ore which is believed to exist between the 5th and 7th levels might be stoped out, and that prospecting work, in a different direction to that undertaken under the management of the late Capt. J. R. Gifford, might be continued. In November, 1904, Mr. Davys resumed his lease, under the new partnership arrangement which has been referred to, and began the extraction of ore in different parts of the old workings above the water level. In the spring of 1905 the surface showing, found by Mr. Richard White (working under a short lease, October 1st to November 15th, 1904) on the surface near the entrance of No. 1 tunnel, was exploited by Mr. Davys, and has since been continued with very satisfactory improvement, and with a widening of the ore body. This surface outcrop was that of a small stringer of good ore, which has since been found also in No. 1 tunnel. The grade of the surface ore was higher, averaging 83 oz. of silver and nearly 9% of copper for the 191 tons shipped to the smelter by Mr. White, than has since been obtained by Mr. Davys.

When this work was resumed in the spring by Mr. Davys, the width of the stringer steadily increased until the width of the shipping ore was fully 5 feet, and now something over 10 tons a day are being shipped from this streak to the smelter at Nelson. The general average of the ore taken out by Mr. Davys from this new streak has been 22½ oz. in silver and 4½ per cent. of copper. The report is indefinite as to the location of this stringer, whether on the foot or hanging-wall side of the main vein, but from the context it may be that this is a portion of the "North Vein," so-called, which, in 1898, showed a similar width and similar values in a crosscut driven from No. 3 tunnel. On this point we do not wish to appear certain, but if we are correct in assuming that it is on the north side there is every reason to believe

that the grade will continue and that the discovery is a new and permanent asset of the property.

In addition to the work on the new vein, Mr. Davys has opened a new shaft on the Kootenay-Bonanza, lying to the eastward of the old workings on the main vein, which have shown ore of a shipping grade, and of the future of which Mr. Davys is sanguine. So certain is Mr. Davys of the output of valuable ore from the new discoveries on the surface that he has advised that the unwatering of the mine to the 7th level should be deferred at present, and probably until the winter comes in and shuts off surface work. The directors state that under the partnership arrangement with Mr. Davys the total tonnage sent to the smelter has been 376½ tons, averaging in value \$22.00 per ton.

Work on the Emma group of mines in the Boundary country has shown a moderate profit, but the developments have been most satisfactory, proving the existence of a large body of good iron flux, carrying considerable values in gold, copper and silver. This Emma property renders the company independent of the market for fluxing ores, and from the sales made to outside smelters there is reason to believe that this iron flux will be a source of increased profits in the future. The sales of ore from the Emma mine to other smelters during the company's year were over 18,000 tons, over 7,000 tons being used at the company's furnaces in Nelson; the total output of the mine being about 25,500 tons. The company's one-quarter interest in the property yielded them a net profit for the year of \$2,849. The other three-quarters interest in this Emma group is owned by the British Columbia Copper Company of Greenwood, a corporation which owns and operates the Mother Lode mine and the large smelter at Greenwood. The management of this fluxing mine has been handed over to the British Columbia Copper Company, as the larger holder, but under an agreement fully protecting the interests of the Hall Mining & Smelting Company.

During the year the smelting works at Nelson have been pretty regularly in blast, and with results which are most creditable to Mr. Hedley, the efficient smelter manager. Like the Trail smelter, the works have suffered at times during the year through the uncertainty of the supply of lead ore, and with the recent closing down for a period of the St. Eugene mines, this uncertainty, we are afraid, may continue for a few months longer. In this connection we may state that this company has been considering seriously the question of improved processes for lead smelting, and, among others, that of the Huntingdon-Heberlein process for sulphide ores. In Mr. Hedley's report it is stated that the total valuation of the material smelted during the year has been \$1,100,000. The expenditure on maintenance and construction has been unusually heavy, by reason of the introduction of new improvements in the plant, the chief of which were for a Merton furnace and a bag house and flue extension. The total expenditure on maintenance and construction amounted to \$43,000.00. Mr. Hedley notes that the most important improvement about the furnaces has been a separator, designed by Mr. Harris, the chemist, which obviates, and does away with, the large and cumbersome settlers, previously in use, with the very beneficial results of much cleaner slags.

The report of the business manager, Mr. J. J. Campbell, is practically the same as the director's report, but it is in greater detail. The purchase of lead ores increased over the preceding year by 4½%, the number of mines from which ore was purchased being greater

by 25% than for the preceding year. The Hunter V and Double Standard mines, operated by the British Columbia Standard Mining Company, supplied during the year all the lime flux needed, and Mr. Campbell reports that the prospects of a permanent supply from these two mines is very good.

The report may be taken as quite satisfactory. The general account shows a balance of profit of £6,023 sterling, equivalent in round figures to \$30,000.00. Of this amount, it is fair to say, that the smelter is credited with over £5,000 stg. The general expenses of the company in British Columbia and London amounted to \$9,000.00, and the interest on the debentures to the very considerable sum of \$7,300.00. We are glad to note the better financial condition of this property, having always had a faith that it would eventually work out its own salvation and yield a profit commensurate with its importance. For many years this property has been one of the representative British Columbia mines on the London market, and also for many years it suffered by injudicious management, both in the Home office and in the Local office, but the changes which have been made are, we think, abundantly justified by the improvement in the financial condition of the property. In fact, although the public generally is unaware of it, the improved condition of the Hall Mines, Limited, is typical of the general condition in British Columbia, which Province to-day is doing better both financially and technically than it has ever done since 1893, and this despite the fact that there is no "boom" or speculative interest in British Columbian mining stocks.

#### PRODUCTION OF MICA IN CANADA.

In the monograph on Mica, issued by the Mines Branch of the Department of the Interior, an attempt has been made, and, we think, successfully, to get together in the form of a concise report all available data and general information dealing with this subject. The report deals chiefly with the commercial side of the matter, although due attention has been paid to the geological people. The exploitation of mica in Canada has been attended with many difficulties, on account of, principally, the great dispersion of the deposits throughout the country, their sporadic and often erratic occurrence and difficulties of transportation. Mica occurrences are confined more or less to pegmatite dykes in the Laurentian formation. These pegmatite veins or dykes occur throughout Canada in a number of places where the Laurentian formation is exposed. The best deposits so far discovered, however, are those of the Saguenay district below Quebec, and in addition to these deposits are found to the north of Ottawa, in the vicinity of Mattawa, at several places in Ontario, and also at Tete Juane Cache and near Golden in British Columbia. The principal discoveries in the Saguenay district were made in the townships of Bergeronnes, Tadousac and Escoumains. In the County of Ottawa the Villeneuve mine was at one time regarded as the most important white mica property in the country, and was worked from 1884 to 1898. Between the years 1884 and 1888 thirty-five thousand pounds of cut, marketable sheets were produced, one crystal weighing 281 lbs. and measuring 30 x 22 inches, having yielded \$500.00 worth of merchantable mica. In Ontario several deposits of promise have been discovered in the Township of Aylwyn and in the Parry Sound district.

The status of the industry in Canada is described in chapter V of the bulletin.

Canadian mica mining was still in its infancy ten years ago. It has now assumed such proportions as entitle it to a prominent position amongst the mineral industries of the Dominion. In its early days mining was carried on in a spasmodic manner, that is to say, deposits were only tested superficially and as soon as a little dead rock threatened to cut off the mica the mine was abandoned. Many of the smaller producers worked intermittently, taking out the mica which outcropped on their farms and stopping work with the falling market or when the deposits were, in their opinion, exhausted. These erratic methods, and constant shifting of operations from one place to another proved altogether too expensive. A new era has set in, a more practical system has been adopted and development work in mica mines is now pursued in-depth. And further, while formerly the mica industry was in the hands of individual operators, having in most cases only a very limited amount of capital at their disposal, to-day powerful companies owning extensive areas of mica lands have started operations on a large scale. To these companies is due the erection of substantial cutting establishments in the centres of the mica districts. These large concerns, realizing the immense importance of the qualities exhibited by the Canadian mineral, begin by testing their properties in the most systematic manner, both by the use of the diamond drill and by exploration work on the surface. There is no doubt that a great many properties, either on account of the lack of experience or unscrupulous manipulations of the operators, have been condemned and abandoned, whereas they should, with efficient and honest management, have continued to yield a large and profitable output. The machinery installed by the large companies, compared with that of former years, is of a more substantial nature, and is erected with a view to deep sinking and extensive operations. Large sums of money have thus been spent in advance of actual production.

Formerly when deep shaft mining was attempted, all the mica within reach, practically all that was visible, was mined without a thought being given to reserves, but in the last few years several mines, especially those in the Ontario section, realizing the immense importance of such an ore reserve in case of a sudden exceptionally large demand for mica, have carried on operations with this important object in view and the result is that these mines have now large reserves ready to be stoped at any desired time. The advantages of such a policy are obvious.

As to the future possibilities of the productive mica fields of Canada, there is no doubt that the future outlook for the production of a large tonnage is very bright and if Canada should ever be called upon to furnish the world's supply the mica fields of Ontario and Quebec could soon be prepared for such an emergency.

There are at present employed in the mica industry 550 persons, but nearly all the mines and mica-cutting establishments are only employing about half the usual number of persons owing to the temporary slackness of the demand, probably due to last year's over-production. For instance, the General Electric and Laurentide Mica Companies usually employ in each of their cutting establishments over 300 hands, whereas at present they employ only half that number. The same remark applies to the larger mines like the Lacey, Blackburn, Wallingford, Laurentide and others. The wages paid last year amounted to a total approximately of \$120,000. It is estimated that the total outlay for plant, including buildings and all acces-

sories, employed in the mica industry amounts to approximately \$160,000.

The total value of the mica produced in Canada up to the beginning of 1904 is placed at approximately two million dollars.

Most of the mica is absorbed by the United States, which placed a duty of twenty per cent. *ad. val.* and six cents per pound on thumb trimmed mica. Efforts have been made in recent years to create a market for the Canadian mineral in England in competition with the East Indian product and the statistics furnished by the Department of Trade and Commerce show that Great Britain has commenced to take a large part of our production.

#### EXPORTS OF MICA.

Year.	To	To
	United States.	Great Britain.
	lbs.	lbs.
1901.....	761,991	211,833
1902.....	868,645	115,388
1903.....	720,489	653,081

#### PRICES.

##### *Muscovite.*

Prices for commercial muscovite fluctuate considerably, depending on the transparency and perfection of the sheets.

A dealer quotes the following prices for medium quality Canadian muscovite:—

1" x 3" thumbtrimmed, per pound. . . .	12 cents
2" x 3" " " " " " " " " " " " "	25 "
2" x 4" " " " " " " " " " "	40 "
3" x 5" " " " " " " " " " "	75 "
4" x 6" " " " " " " " " " "	100 "

##### *Phlogopite.*

The prices paid for Phlogopite of the different sizes naturally fluctuate considerably and much speculation is manifested amongst mica dealers. The following table gives the present prices paid by a large firm:—

Size.	1" x 3",	10 cents per pound, thumbtrimmed, (not cut)	
	2" x 3",	22 " " " " " " " " " "	" "
	2" x 4",	30 " " " " " " " " " "	" "
	3" x 5",	55 " " " " " " " " " "	" "
	4" x 6",	75 " " " " " " " " " "	" "
	5" x 8",	100 " " " " " " " " " "	" "

In this connection it is interesting to note that Sir William Logan in his report of progress for 1863 mentioned a sale in London of several hundred weights of large, selected mica crystals, taken from a locality north of Burgess, and fit for splitting into thin plates. The price was two shillings per pound, while from four pence to seven pence was given for inferior qualities. There was also a large demand for smaller sizes and for the refuse. The former, among other uses, was employed in making letters for window signs. Ten shillings a hundredweight was offered in London for fifteen or twenty tons of such material.

There are altogether seven mica cutting establishments in Canada, six of them are located in Ottawa and one in Kingston. In busy times these factories give employment to approximately 800 persons. The factories in Ottawa are operated by: The Laurentide Mica Company, The General Electric Company, Blackburn Bros., Wallingford, Munsell and Sills-Eddy and that at Kingston by Kent Bros.

**ASBESTOS MINING IN CANADA.**

The preparation and compilation of this important monograph, issued by the Mines Branch of the Department of the Interior, was entrusted to Mr. Fritz Cirkel, M.E., of Montreal, who appears to have carried out the work with commendable care and zeal. The report is comprised in a volume of upwards of 200 pages, handsomely illustrated with diagrams and photographic reproductions, and includes chapters on the following subject:—

Physical and chemical properties of the mineral; geological occurrence and distribution in Canada; the mining of asbestos; methods in vogue and machinery employed; dressing, hand sorting and mechanical treatment; cost of production, market and prices; status of the industry; statistics; description of mines and prospects; commercial application; occurrence in foreign countries; extract of laws governing the prospecting for and mining of the mineral in the Province of Quebec.

Asbestos was first discovered in Canada in the Des Plantes River region between St. Joseph and St. Francis villages, in the Province of Quebec, in 1862, but all attempts to work the deposits profitably at that time failed, and nothing was done until 1877, when new discoveries were made in the serpentine hills of Thetford and Coleraine. Prospecting was much facilitated by the fact that the whole of this region had been swept by forest fires, and considerable areas were acquired both at Thetford and Black Lake, near the line of the Quebec Central Railway. In 1878 mining operations were commenced on a small scale and 50 tons of material produced. Some years later shipments made to London created, on account of the excellent quality of the asbestos, a considerable sensation, and in consequence of extensive tests and investigations capital became largely interested in the exploitation of the new fields. During the ten years following, the industry developed at a rapid rate; the mines were worked on an important scale, and prospecting became active in the surrounding country. But with the primitive methods employed of hand extraction only, the very rich ground could be made to pay, and many mines producing but a small percentage of the higher grade product were forced to shut down, and this, accentuated by over production and a consequent fall in prices caused a depression in the industry from which it suffered for some time in the nineties. Conditions, however, were permanently improved later by the introduction of machinery to replace handcobbing, and to-day every mine in the district is equipped with a complete milling and fiberizing plant, by which means all the smaller fibre, at one time left in the rock and thrown on the dump, is now saved. Thus, there are now working in the district sixteen mills, having an aggregate capacity for the treatment of 3,500 tons of asbestos rock daily, and it is reported that both the capacity of the mines and mills is to be materially increased in the immediate future. As Mr. Cirkel very properly puts it, the asbestos industry is a striking example of what human ingenuity, if applied in the right direction, may accomplish. It demonstrates that in order to attain success it is necessary "to strive, to seek, to find and not to yield."

Asbestos, in its commercial form, is, we are told, a product of at least two distinct minerals, both having in common only a fibrous structure and more or less fire and acid proof properties. These minerals are:— (1) amphibole, or hornblende asbestos (tremolite and actinolite) and (2) serpentine asbestos (amiantus) and Canadian chrysotile asbestos. Both possess

heat resisting properties to approximately the same degree, but the chrysotile variety possesses greater strength of fibre and can alone be used satisfactorily when this character is desired as well as non-conductivity of heat. The actinolite deposits occur in the Township of Elzevir, in Hastings County, where mineral has been mined since 1884 near the village of Actinolite. Operations having been carried on by the International Asbestos Company and the Joseph James Company. It is claimed that from 30 to 40 per cent. of all the rock mined is treated in the mill, and about 10 per cent. extracted as fibre. The market for this mineral however is limited.

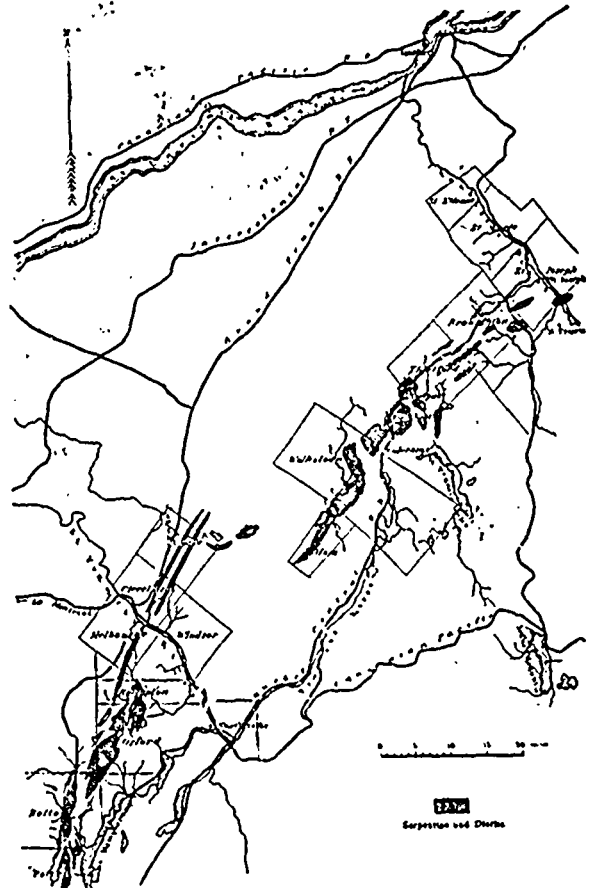


Fig. 1.—Map showing distribution of serpentine in Eastern Townships of Quebec.

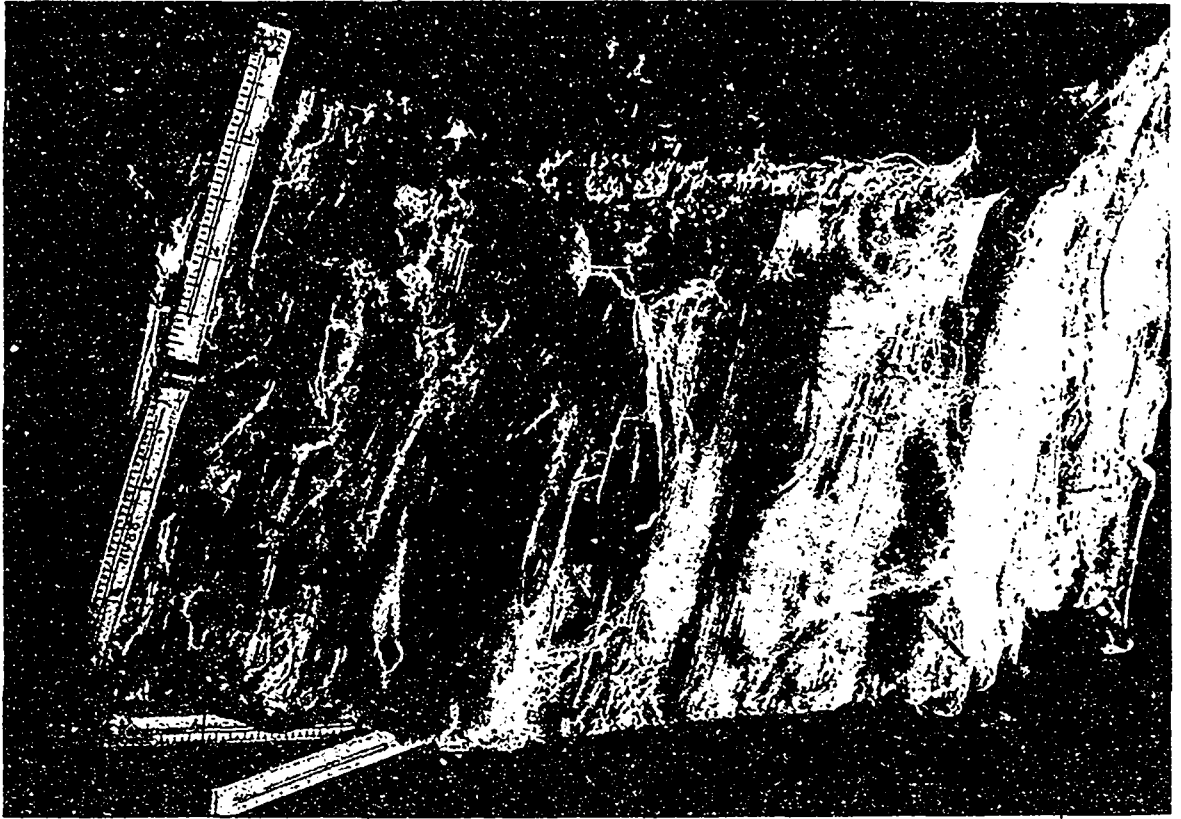
Chrysotile asbestos is a fibrous form of serpentine and the Canadian variety possesses in an essential degree those qualities which make for economic value, namely, length, fineness and elasticity of fibre, tensile strength, flexibility, and power of fire resistance. It has also a great adaptability for spinning. The hardness of the Canadian chrysotile is from 3 to 3.5 Mohs' scale, and its specific gravity 2.2 to 2.3. An interesting comparative table, showing the composition of Canadian fibre, as compared with the Italian, is given in this report, from a statement prepared by Prof. J. Donald, as follows:—

	ITALIAN FIBRE	CANADIAN FIBRE		
		Cambrian, Thetford	Chrysotile, Broughton	Laurentin, Templeton
Silica.....	40.30	39.05	40.87	40.52
Magnesia.....	43.37	40.07	41.50	42.05
Ferrous Oxide.....	0.87	2.41	2.81	1.97
Alumina.....	2.27	3.67	0.90	2.10
Water.....	13.72	14.48	13.55	13.47
	100.53	99.68	99.63	100.10



The report divides the occurrences into two classes, (1) The species belonging to the Laurentian formation in the Templeton area North of Ottawa, in connection with the serpentine limestone and (2) the asbestos of the Eastern Townships, more particularly confined to the serpentine area of the mountain belt which extends from the boundary of Vermont to the extrem-

covered with heavy humus and forest growth prospecting is very difficult, and unless the forests are destroyed by fire, and the soil removed as was the case in Black Lake and Thetford, it is questionable whether the presence of the mineral in paying quantities will ever be established. The geology of the Thetford Black Lake area is thus described in the report.



Canadian Chrysotile Asbestos.

ity of Gaspé peninsula. The deposits in the Laurentian need not be discussed at length since so far it has not been found profitable to work them. The distribution of serpentine, meanwhile, in the Province of Quebec is included in the following area and shown in the accompanying map, (1) the area covering the Gaspé peninsula, (2) the Thetford Black Lake area, (3) the Danville Orford and Potton area. Mr. Cirkel goes very thoroughly into the geology and general features of the serpentine in these areas, the most important

THE THETFORD—BLACK LAKE AREA.

*Geology and General Features of the Serpentine.*—The workable asbestos deposits of this area are confined to the serpentine belt near Black Lake and Thetford and to a small detached area near East Broughton station

The serpentines of the townships form disconnected masses, generally of small extent in the great series of slates, schists and diorites designed as a part of the Cambrian formation (Fig. 3). Occasionally they as-

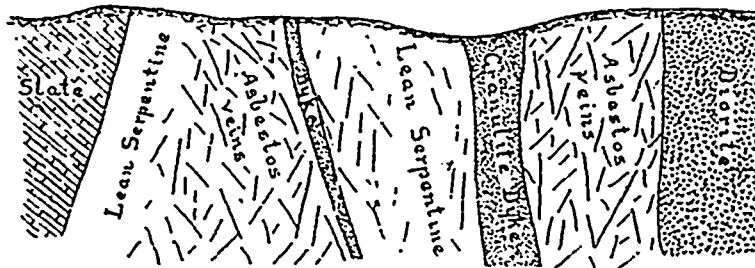


Fig. 3—Profile of Asbestos-bearing formation at Black Lake and Thetford.

field of which, from an economic standpoint, is that of Black Lake and Thetford, where a great part of the serpentine is asbestos-bearing in commercial quantities, and here the mineral is mined on an extensive scale. In the third, or southwestern area, asbestos has only been discovered in considerable quantities at Danville, and it is pointed out that as this area is

sume such proportions as to form mountain ridges as may be noticed in Black Lake, where most of the productive mines are located on the great serpentine ridge which attains a height of 900 feet over the track of the Quebec Central Railway and strikes in a northerly direction through the country. The serpentine masses are unquestionably an alteration product

from an olivine diabase or gabbro, which forms also prominent hill features in this area.

All the rocks in the district from Vermont north to the St. Lawrence river have been subjected to a great series of folding and disturbances\* and evidences of this effect may be seen all through the asbestos region in the decidedly slaty and schistose structure of parts of the serpentine masses. The rocks in Thetford and Black Lake, however, although exhibiting to some extent faults and slickensides have withstood the strain of pressure and are of a more massive character.

Slickensides and faults as a result of these movements are very frequent throughout the serpentine region and in some places have cut off entirely working faces, presenting a barren wall for a time. Sometimes, however, veins of good asbestos are concealed by the soft slippery serpentine with which they are covered and it is necessary, therefore, that the miner should examine these walls very closely before he is fully certain that they are barren.

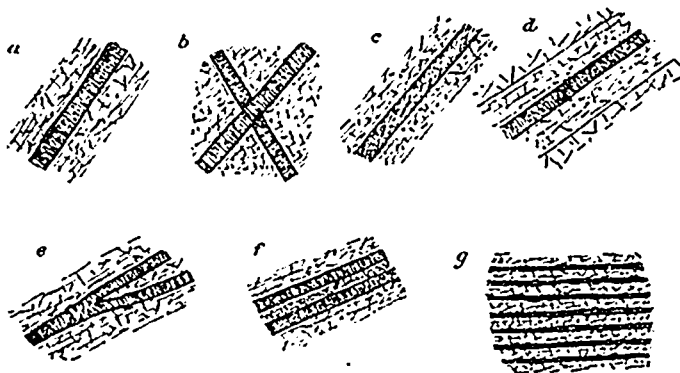


Fig. 4.—Typical Asbestos Beds

- (a) Regular vein.
- (b) Crossing of veins.
- (c) Drawn out vein in fault or slickenside.
- (d) Seamy parting containing vein in middle.
- (e) Forking of vein.
- (f) Two veins divided by small seam of chromic iron and serpentine.
- (g) Ribbon like arrangement of small veins.

The serpentine exposed in different sections of this area varies considerably in character. Some of the rock is hard and silicious and dry looking, as in some portions of Black Lake, Ireland and Wolfestown and contains no asbestos. Sometimes it exhibits a tarnished yellow colour and in most cases imperfect, stiff or harsh fibre is found. Frequently seamy partings can be observed (Fig. 4d and Plate III), crossing the rock in every direction and while it is true that in a great many of them no asbestos can be found, still it appears that these indications form characteristic features of the presence of the mineral in some of the mines. In certain portions of the belt these seamy partings are quite numerous and by some prospectors are supposed to indicate the presence of asbestos veins. Even in the mining district of Black Lake and Thetford there are large portions of the serpentine belt which do not contain asbestos in payable quantities. The rock carrying good asbestos veins is generally of a gray weathered, dark green or gray green colour. It contains to some extent numerous particles of iron ore, both magnetic and chromic and as a rule serpentine rock of a black, hard, chippy aspect does not promise well for the presence of asbestos.

The serpentine is often cut by dikes of granite, which can be noticed in most of the mines in Black Lake and in Thetford. They range in size from small bands of one and two feet up to large intrusions of 50 and 100 feet in width and some of the grey and reddish varieties form conspicuous hills between the villages of Thetford and Black Lake.

In many cases these dikes have shattered and altered the rock in contact; the latter appears to be highly fissured and at places large accumulations of asbestos veins can be noticed, apparently indicating that the intrusion of these dikes has exercised some influence in this direction. Sometimes these dikes cut off the work entirely and very often a face of good asbestos veins, but good ground is generally found by driving through the dike mass.

*Characteristics of Asbestos veins.*—The veins in the asbestos bearing rock occur without any special arrangement, intersecting each other and the mass generally in every direction, but generally forming straight lines. (Fig. 4). Sometimes they split up in several smaller veins or coalesce and form a larger vein. Certain peculiar arrangements, however, are noted in some of the areas, as at the King Bros. mine in Ireland\* where the serpentine appears to be regularly stratified almost in the manner of sandstone or quartz in layers dipping to the northwest and the veins of asbestos

apparently follow what in sedimentary rocks would be regarded as bedding planes. In several other places the veins cut the rock in an almost horizontal direction and when found in a knoll can be traced across from one side of the hill to the other, nearly on the same plane, but as a rule the veins are irregularly placed.

The thickness of the veins varies from mere threads up to several inches, but it may be said that the largest bulk of the asbestos mined is between one quarter and one half inch in length. The longer fibre is very often divided in the middle by a seam of serpentine carrying magnetic or chromic iron ore. As a rule, in most of the mines the asbestos can be easily separated from the rock, but in some veins the fibre appears to be frozen to the rock, its complete separation being very difficult.

The veins are sometimes displaced by the action of faults and slickensides in the serpentine, giving the impression that the fibre is of considerable length, whereas when closely examined it is found that the veins carry fibre of the usual length, but drawn out along the fissures. (Fig. 4c). Sometimes a long, woody fibre is observed deposited in a fissure between two rock portions. This woody material usually termed hornblende by the miner is in reality a picrolite and can be noticed principally in the mines at Thetford and East Broughton.

A peculiar occurrence of asbestos is noticed in the Megantic mine at Coleraine. Here the serpentine

\*Geological Survey Report, 1890-91, page 20 S.

\*Dr. Eils, paper read before the Asbestos Club, Black Lake February 19th, 1931.



for several feet is laced with small, minute veins of asbestos one-sixteenth and one-quarter of an inch in thickness, giving the rock a ribbon-like structure. This same mode of occurrence can also be noticed in some mines of Black Lake.

#### THE EAST BROUGHTON AND DANVILLE AREAS.

A small detached area of serpentine occurs in East Broughton. The serpentine is enclosed between a highly quartzose slate, probably of Cambrian age. Its largest width is about 700 feet and its general trend about  $20^\circ$  east of north. (Fig. 5). Most of the serpen-

of serpentine. Much of the fibre is short, but it is of an excellent quality, being of a grass-green colour when freshly broken. Occasionally fibre measuring two inches in length is found. Large sheets of ligiform serpentine of white and green colour are found along fracture lines in the serpentine, resembling picrolite, which is sometimes so soft that it can be cut with a knife.

Another detached mass of good serpentine occurs near Danville. This whole area is much affected by faults and some of the larger veins are cut off by intrusive dikes. However, the quantity of fibre appears to

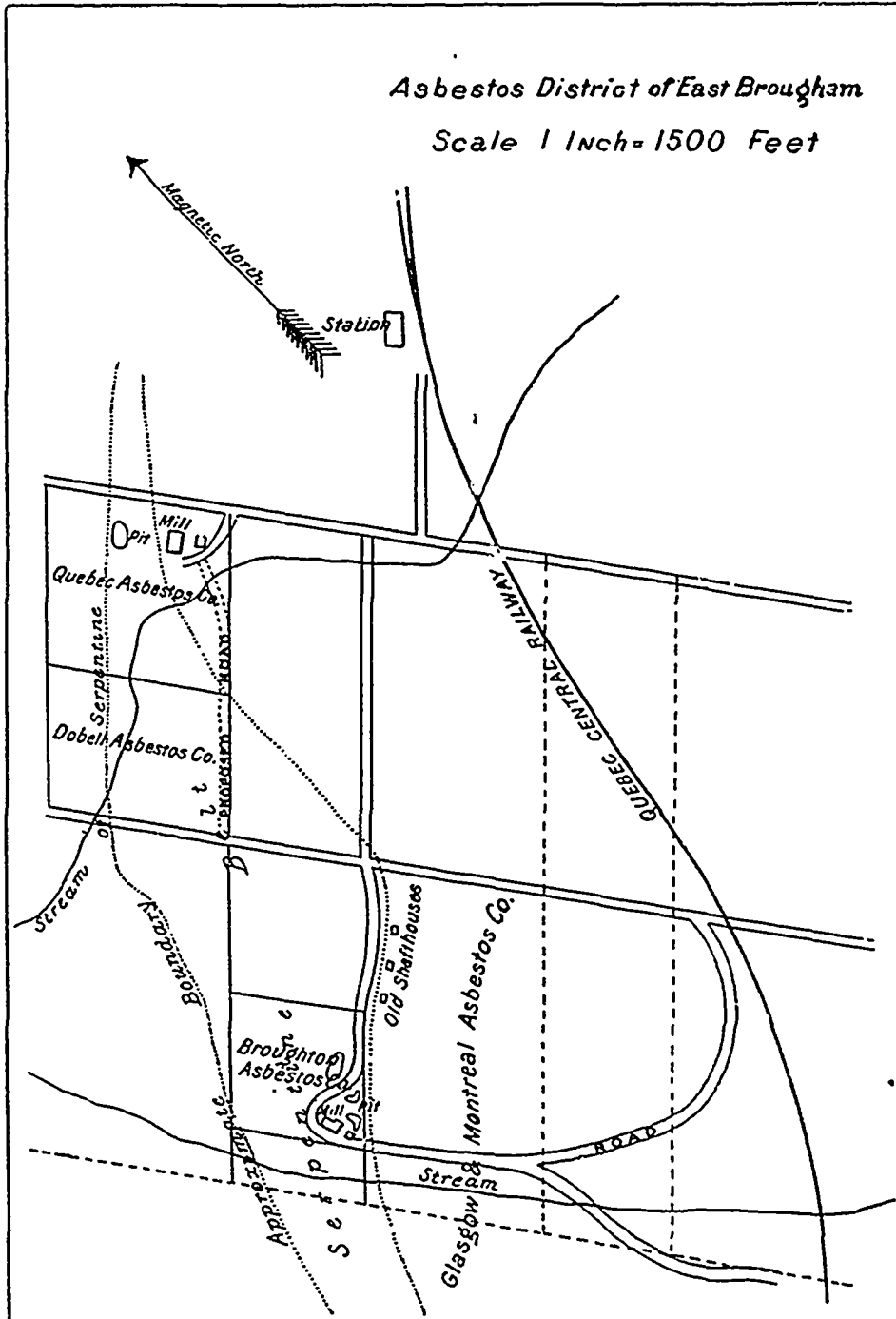


FIG. 5.—Asbestos District of East Broughton Scale 1 inch = 1500 feet.

tine is completely shattered, is much softer than the serpentine of Black Lake and Thetford and is easily mined. The asbestos forms small gashy veins along the cleavage planes, is sometimes crushed and seems at places to be disseminated through the whole mass

be large and the general conditions for mining excellent. Asbestos up to one-half inch and longer occurs plentifully, while the whole of the serpentine is impregnated with very fine, short fibre, representing a first class milling material. It is stated on good authority

that between seventy and eighty per cent. of the total rock mined goes through the mill.

Most of the mining of asbestos in Quebec is carried on by open quarry work. The soil which covers most of the asbestos-bearing areas, to a thickness varying from a few feet to 25 feet, is first removed, and in the case of one property a steam shovel has been utilized for this purpose. In the smaller mines the quarries have generally an irregular shape, following the trend of the asbestos-bearing zones, but in the larger properties where a careful study has been more fully made of the location of the asbestos-bearing and lean rock quarries are generally rectangular in form, and the rock is taken down in a series of benches, stopes and terraces, varying from 5 feet in the highest level of the pit to perhaps 30 and 40 in the deepest part. Blasting is done by arranging bore holes in rows and as nearly as possible parallel with the longest free side, the depths of the holes ranging between eight and ten feet. Ingersoll and Rand types of rock drills, with  $3\frac{1}{2}$  cylinder and a stroke of  $3\frac{3}{4}$  inches are also employed. The expense for explosive per ton of rock broken is about 3 cents per ton. After the blasting the material is hand sorted, the long asbestos fibre and rock containing the same being sent to a cobbing shed, while the milling material, or rock containing shorter fibre, and the fine material and scrapings of the pit, are sent to the mill, the fines passing first through the dryer. Boom derricks are employed in a few of the smaller mines, or where dumps are worked over, but in most cases where mining on a large scale is in progress, heavy boom and cable derricks are in use. The position of the cable derricks is determined by the location and number of working points in the pit, and changes with the shifting of operations. In most of the larger mines the motive

inch in length, while at other properties a No. 2 grade is also produced measuring from five-sixteenths to three-quarters of an inch in length. In hand cobbing the rock is broken up by hammers, and the long fibre screened by sieves with 3-16" holes, and sent to a finishing shed, while the screenings and the rock containing shorter fibre are delivered to the mill. In the finishing shed the No. 1 fibre is cleaned by a sieve with 9-16" holes and the No. 2 fibre by a sieve with 3 S" holes, in order to get rid of all adhering rock particles. The crude fibre is then packed in 100 lb. bags ready for the market. Cobbing is generally done by contract at a price varying from 30 to 35 cents per cwt. The fines from the pits and cobbing sheds contain a considerable quantity of moisture, and are dried by exposure to the air by means of steam pipes and by rotary dryers.

The mechanical dressing of the asbestos-bearing rock consists in outline of a preliminary crushing in rock breakers of different type, both the jaw-breaker of the Blake pattern and the gyratory breakers of the Gate pattern being used. These machines simply reduce the large rock preparatory to fine crushing by rolls. The secondary crushers are of two types—those crushing by direct pressure as exemplified by the well known type of Cornish rolls, and those comminuting the rock by centrifugal force as typified by the beaters and the well known "cyclone" mill. Neither of these machines need be described in detail, it is only necessary to say that the matter of size depends upon the tonnage requiring treatment, and the choice between a smooth surface roll or a corrugated roll is a matter of personal choice and of requirements of the fibre in one or two mines. The cyclones effect the liberation of the fibre from the rock, but it becomes necessary to break up the veinlets of asbestos

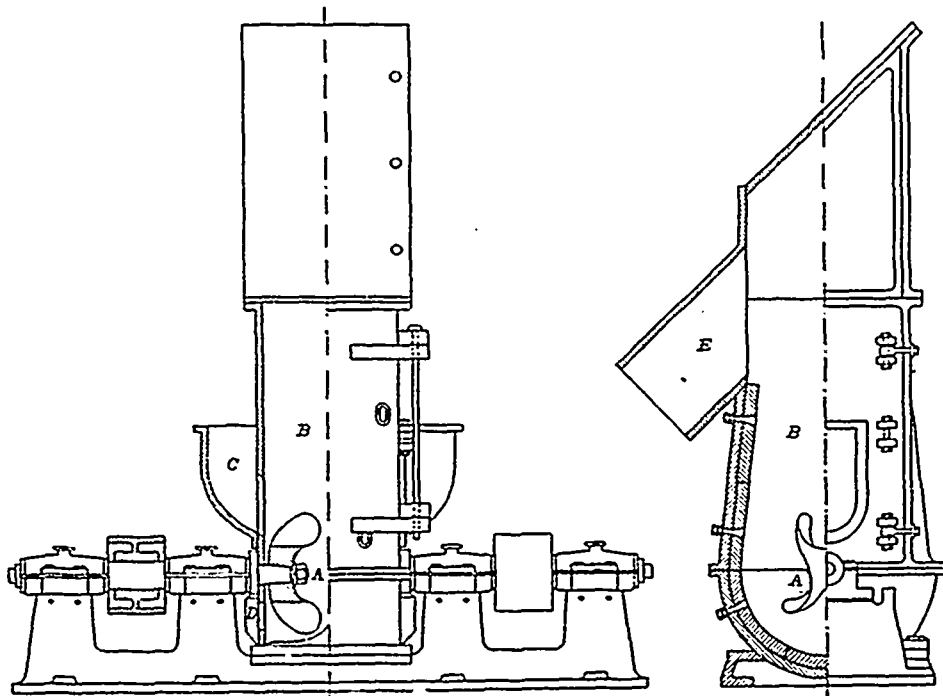


Fig. 6.—Cyclone Fiberizer as manufactured by Laurie Engine Co.

power for actuating rock drills, hoists, etc., is compressed air.

Chapter III of this report deals with the dressing of asbestos for the market, which includes hand dressing and mechanical dressing. Hand dressing is confined to the cobbing of No. 1 and No. 2 grades only; some mines make only No. 1 crude, measuring over  $\frac{3}{4}$  of an

into the fine filiform fibre of the clean mineral. For this purpose fiberizers of different type are used, the commonest one being in the form of a hollow cylinder in which revolves a shaft furnished with arms, or knives, which strike the mineral crush the lumps and fiberize the compact asbestos. The cyclone machine as we have already said, is now well known in the

market, and its efficiency has been repeatedly demonstrated. The only objection to the cyclone is that it destroys a portion of the fibre by its violent action, but as it does its work better than any other apparatus it remains the chief factor in separation in spite of the losses incurred. Its principle is that of two screw propellers revolving in opposite directions in an enclosed case, the speed of the revolution varying from 2,000 to 2,500 per minute. The fine fibre is drawn from the apparatus by a suction fan.

tion, market and prices, statistics and status of industry. In respect to the former an example has been taken of a mine which has been working for some years on fairly good ground, operating mill and mine by day shift only, and treating between 80 to 90 tons of rock, all grades produced averaging about 9.5 per cent. of the rock milled. At this property the pit foreman receives \$2.00 per day, engineers \$1.75, air drillers \$1.75, blacksmiths \$1.75, derrick men and miners \$1.25. At the mill the foreman is paid \$2.00 per day

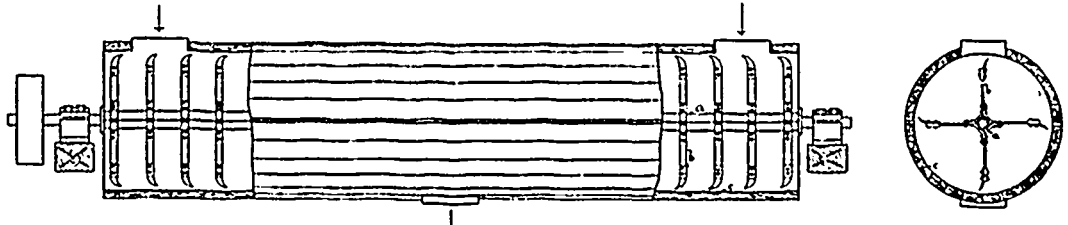


Fig. 7.—A Cylindrical Fiberizer.

Where the mill tailings are sufficiently valuable they are grounded to a fine powder for use in plastering. The fiberized mineral drawn from the mills by suction fans is deposited and collected in chambers. Accessory to the pulverizing and grinding machinery are the screens conveyors, etc., which do not need particularizing to our readers.

The cost of labour employed in the mills varies. At one of the larger plants the cost per ton of milling rock equals 29 cents, or \$3.11 per ton of fibre. In another mill of larger capacity these costs are reduced to 25 cents and \$2.56 respectively.

and the mill wright \$4.00, and other labour from \$1.25 to \$2.00.

The operating expenses are:—

Per ton of total rock mined. . . . .	53 cts.
Per ton of milling rock . . . . .	83 cts. (mining)
	80 cts. (milling)
Per ton of asbestos. . . . .	8.86 (mining)
	8.55 (milling)

or total cost of production per ton of asbestos mined and milled \$17.41. Of this item \$10.13 is charged against wages and \$4.19 against power. Were the

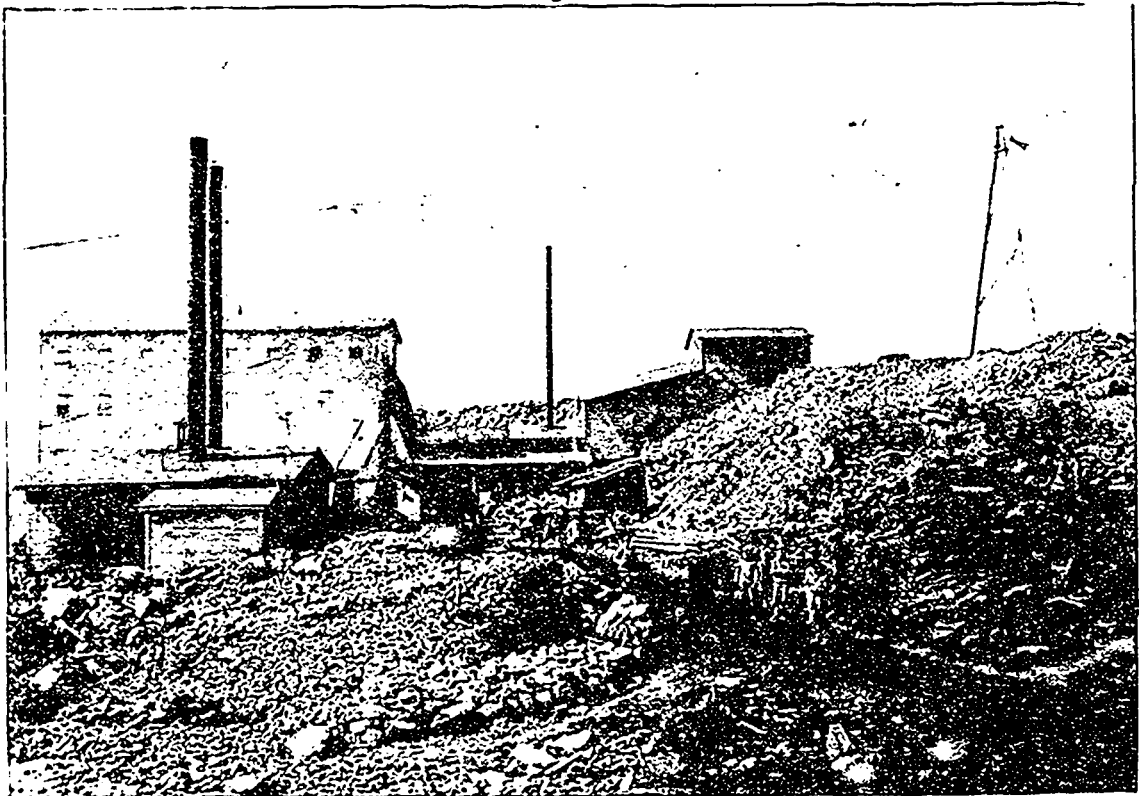


Fig 8—A Typical Mill.

So far as known the lowest percentage of asbestos milling rock of the total rock mined is 20 per cent. and the highest 70 per cent., but the average may be placed at from 30 to 60 per cent. of all the rock mined. Chapter IV of the report discusses the cost of extrac-

capacity of this property increased to 300 tons of milling rock, producing from 25 to 30 tons of asbestos, it is estimated that these costs might be lowered to \$14.50 per ton of asbestos produced.

Canada is now the largest producer of asbestos

the world, the value of last year's output being valued at \$1,167,572 00. This is the largest output that

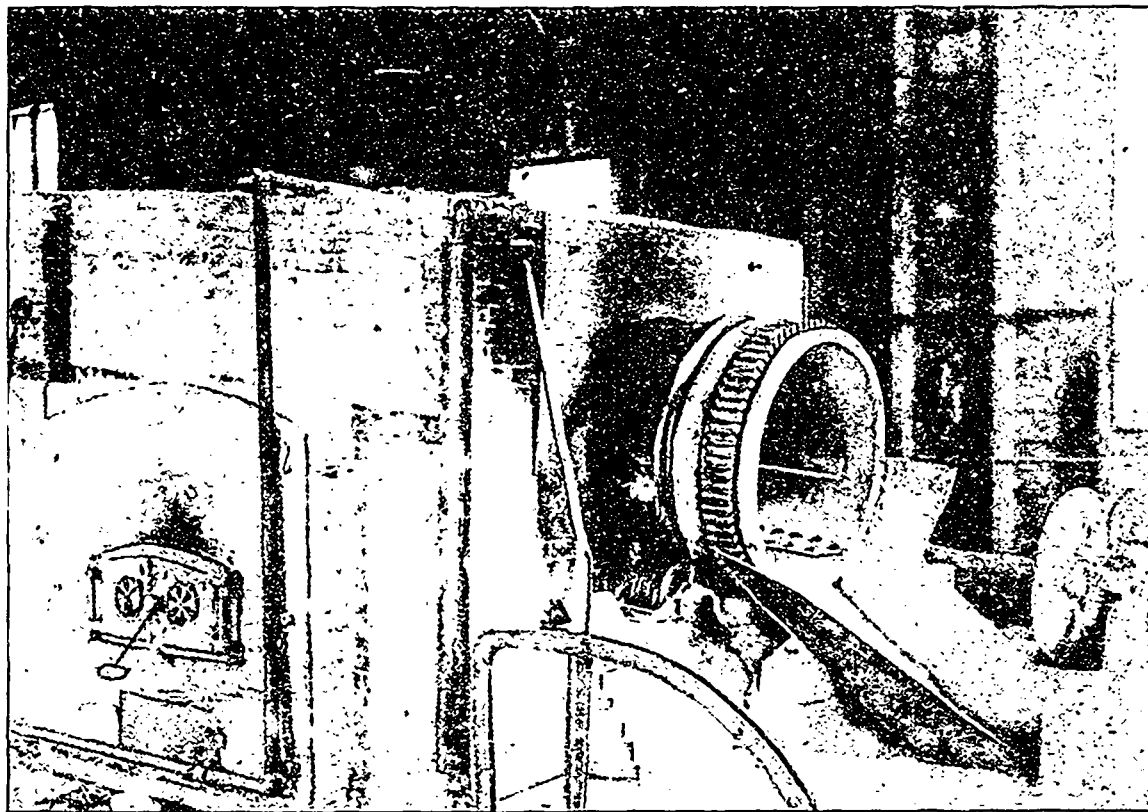


A Bunch of Fiberized Asbestos, ready for market.

has ever been made by the Canadian mines. The prices per ton at present are for No. 1 crude from \$175.00; to \$200.00; No. 2 crude \$110.00 to \$125.00; fibre No. 1

Since the introduction of mechanical separation which has enabled the operators to extract the small fibre from the large dumps covering in some localities valuable ground, the industry, as a whole, has taken an altogether different aspect, in fact it has been revolutionized in every direction. Many mines which were working on poor ground and could not produce the better qualities have had a chance to realize on the abundant quantities of small fibre, while the larger companies could turn the immense dumps into realizable assets, thus adding considerably to their yearly dividends. Since the year 1896 the demand for fiberized asbestos has steadily increased from year to year owing to the numerous new applications of the lower grades. Additions to the already existing mills have been made, new and more modern mills designed and erected, the capacity of the mining plants increased and the result is, that we possess to-day an industry which is one of the most prominent economic resources of the country. In order to appreciate better the rapid advance made for the last eight years, it may be mentioned that, in 1896, only six mills were in operation, with a total maximum capacity of approximately 900 tons, while to-day there are not less than sixteen mills in existence, with a combined maximum capacity for treating 3,500 tons of asbestos rock per day, and, if all the plans of the larger companies working in the district are realized, the capacity of the industry will be increased during the year 1905 to 4,500 tons of asbestos rock per day. It must be mentioned, however, that some of the smaller mines work only intermittently and that a steady production of asbestos from these sources cannot be relied upon.

There are, altogether, fourteen companies incorporated, of which ten are operating their mines and mills,



Rotary Dryer at the Johnson's Asbestos Co., Thetford

(special) \$75 00 to \$80 00; fibre No. 2 \$50.00; paper stock \$20.00 to \$25.00.

The status of the industry is summed up in the following paragraph:—

employing about 1,500 men. At present there is a shortage of good miners and, at the time the report was written, it was difficult to operate the mills and mines to their full capacity on this account.

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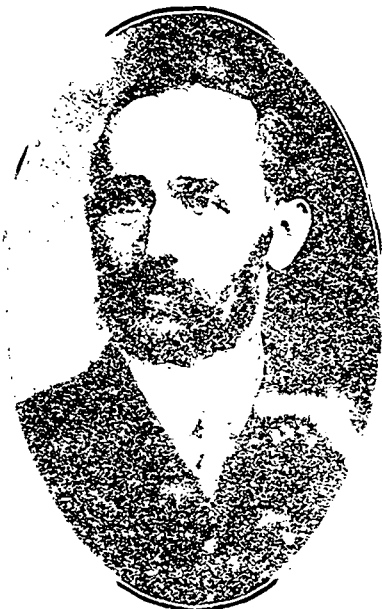
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### NOTES ON THE LIEGE EXHIBITION.

By Our Special Commissioner.

The City of Liege, in Belgium, population 160,000, is the centre of a considerable industrial and manufacturing district. It is surrounded by numerous coal mines and metallurgical works, including the celebrated John Cockerill Company, employing 12,000 men, the Vieille Montagne Zinc Company, and, in addition, many iron construction works, arms and automobile factories, etc. The Liege University has over 1,500 students, most of whom are engaged in the several branches of engineering study. This university receives many foreigners as undergraduates, while the Montefiore Institute, for the study of electricity, is another famous educational establishment in this city. Consequently, it may be easily understood that the people of Liege take an especial interest in industrial matters, which also accounts for the fact that the recent exhibition was so loyally supported by them.

of cobalt-silver ores from Haileybury, the estimated value of which was \$6,000; corundum from the Craig mine, with also specimens of finished product; asbestos from Thetford, crude and manufactured material; amber mica from the Ottawa Valley and white mica from the St. Lawrence Valley; radium ore from Murray Bay; galena and copper gold ore from British Columbia; coal from Vancouver Island, Crow's Nest Pass and Alberta Districts; iron ores, coal and gold-bearing quartz from Nova Scotia, and last but not least a fine display of gold dust and nuggets from the alluvial fields of British Columbia and the Yukon.

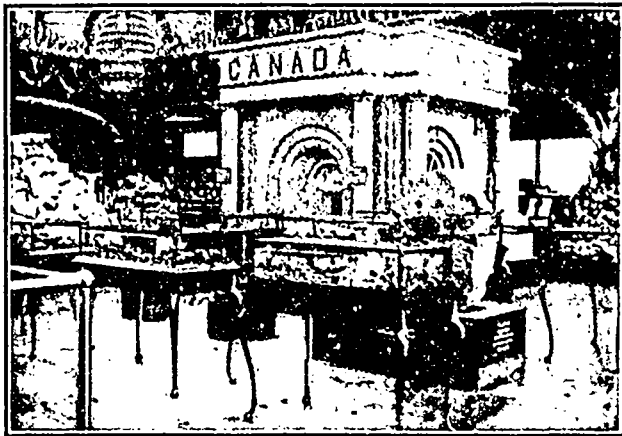
No less complete and interesting was the display of building material, such as granites, limestones and sandstones, specimens of which were shown in the form of polished cubes. Then, too, there were piles of plumbago, apatite, talc and feldspar, while such minerals as manganese, gypsum, baryte, etc. were shown together with a very large collection of hand specimens from mines in every section of Canada were shown under glass cases. Visitors to the ex-



THE DISPLAY OF CANADIAN MINERALS.—On the left, exhibit of B.C. silver-lead ores; on the right Haileybury cobalt, silver and nickel. In the rear Exhibit of Sudbury nickel and copper. Mr. W. D. Dalglish, of the Canadian Exhibition staff is shown standing at one of the cases.

The Canadian display of minerals, in particular, attracted great attraction, and it is said that of the 6,000,000 people who visited the exhibition quite a considerable proportion thereof passed through the Canadian pavilion. The arrangement of the mineral section was very carefully planned and successfully carried out, with a view chiefly to emphasizing the industrial and commercial potentialities of the Dominion. The minerals and ores were distributed in the hall in large heaps, and prominently labelled with reference to production values, etc. Among the most important displays were Sudbury nickel ores, nickel matte and specimens of refined nickel; a pile

hibition were presented with a complete catalogue printed in French and English, and also with the official reports of the Mining Departments of the respective provinces, while of course the commissioners in attendance were kept very busily engaged replying to enquiries and giving special information to the public. It is believed, in consequence of the information thus supplied that the European markets for Canadian corundum, mica, asbestos, zinc and lead ores in particular, may be extended. During the period in which the exhibition was opened several important international meetings of men representing mining, metallurgical, geological and other sciences



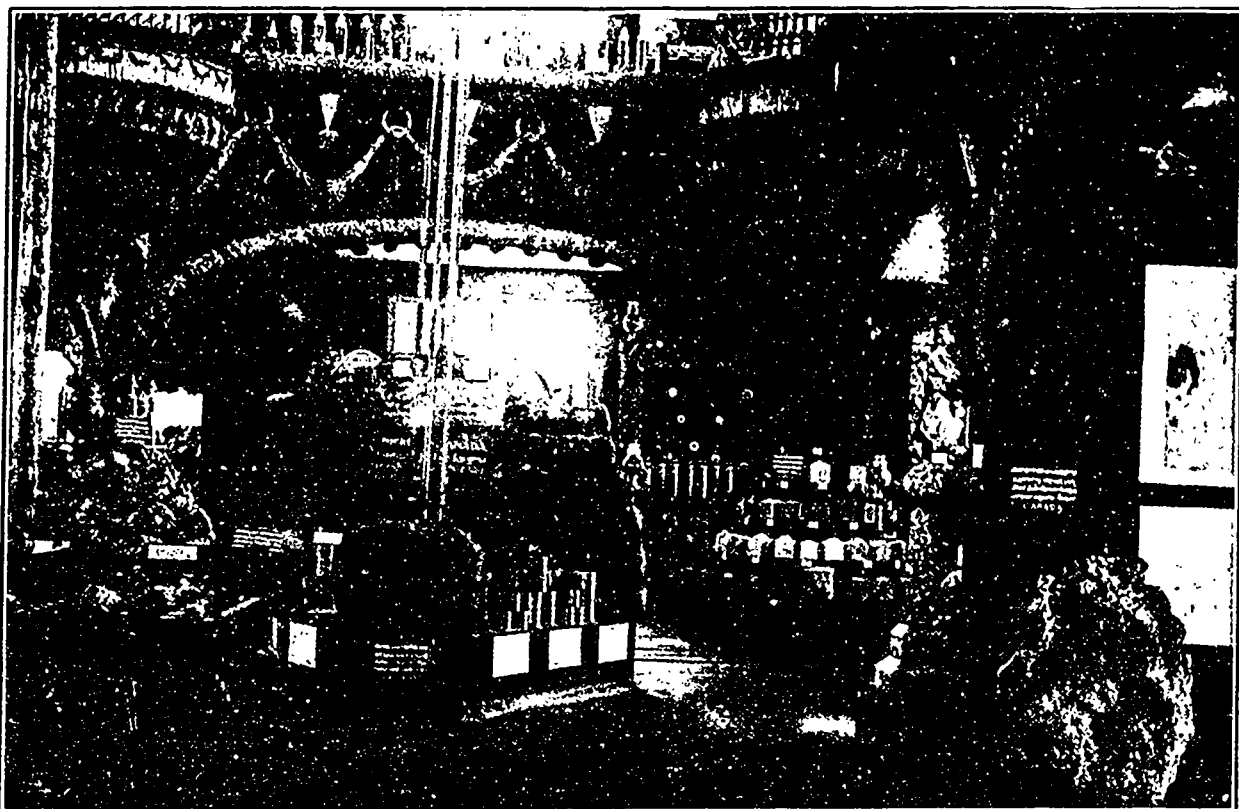
Vault containing gold from Yukon and B.C.  
The large pyramid on the left is composed of ore from Itaipury.

The display of Graphite, Mica and Corundum.

were held at Liege, but it is very much to be deplored that Canada was not officially represented at any of these meetings. The "Congrès International des Mines Métallurgie, Mécanique et Géologie appliquée" was in particular a notable success, no less than 1,200 people, including many eminent engineers from all sections of the globe being in attendance. The pro-

ceedings and discussions were for the most part in French.

While at the Liege exhibition other countries made good displays of machinery, mine products, etc., it was generally conceded that the Canadian exhibit was the most complete and the most representative, and this is a matter for sincere congratulation.



In this section was shown a fine exhibit of Sudbury Nickel, Building Stone, a large block of Asbestos from Black Lake, Que., and a column of Jasper Conglomerates from Bruce Mines, Ont.

**NOTES ON THE CROW'S NEST COAL FIELD,  
BRITISH COLUMBIA.\***

By James Ashworth.

**CROW'S NEST COAL-FIELD.**—The Crow's Nest coal-field is situated immediately west of the summit of the Rocky Mountains, about 370 miles from the Pacific coast, and practically the whole of it lies in British

Columbia. The coal-field is of Cretaceous age, and the rocks of this section cover an area of about 500 square miles; but the coal-field has an area of only about 230 miles and is of leg-of-mutton shape, with a length from north to south of about 35 miles, and a width from east to west varying from 4 to about 11 miles. It is bounded on the west by the Elk river, which runs parallel to the upturned edges of the measures, and the outcrops of the coal are found commencing at an elevation of from 1,500 to 2,000 feet above the river, with a dip to the eastward of from 20 to 40

\*Extracts from a paper read before the Manchester Geological and Mining Society, February, 1905.

degrees. The coal-field is in the shape of a flat-bottomed basin, and the coal therefore crops out with its upturned edges to the north, south, east and west.

The coal-field is based on the Devono-Carboniferous limestone, and in ascending order, from this base, there are beds of dark shale and soft calcareous shales, known as the "Ferne shales," which have been much crushed and folded. The coal-seams above have not, however, been affected to the same extent, particularly on the west and south sides, and it has been assumed that the very hard beds of conglomerate (consisting of black and grey chert, embedded in a silicified matrix) and gritty sandstone (shown at the top of the section of the Morrissey coal-field, made by Mr. James McEvoy),<sup>†</sup> have resisted the eroding crushing and folding forces that are in evidence elsewhere.

The total thickness of the Cretaceous rocks in this coal-field has been estimated at from 12,000 to 13,000 feet and in the section before referred to, there is a thickness of about 198 feet of workable coal in a depth of 1,847 feet of strata. Seams of 3 feet and under are omitted from the calculation.

Samples of the seams of coal collected by the inspectors of mines gave the following percentage-analysis:—Moisture, 0.91; volatile combustible matter, 19.01; fixed carbon, 69.93; ash, 9.83; and sulphur, 0.32. The coke made from these coals is long, lustrous and strong, and is shipped to the smelters in Canada and the United States, *via* the Canadian Pacific and Great Northern railways.

At Coal Creek and Carbonado, the valleys are so narrow, where the mines are opened out, that the coke-ovens (bee-hive) are placed at some distance from the mines; but at Michel, they are close to the works.

A peculiar legislative restriction is placed on the Crow's Nest Pass Coal Company, by which they are prevented from charging more than 8s. 4d. (2 dollars) per ton for run-of-mine coal at the mines.

Most of the coal-seams are soft, and produce a large proportion of small slack.

The seams of coal, now being developed in several places, have not been absolutely correlated, but Mr. J. McEvoy places Nos. 61, 63 and 71 in his Morrissey section, as being the same as the three seams of coal at Coal Creek, which are respectively 10 feet, 30 feet and 6 feet thick. No. 61 seam will therefore correspond with the Fernie mine (Coal Creek, No. 2), in which the explosion occurred in 1902; and with No. 1 mine, Carbonado, where the huge outbursts of gas occurred.\* Although the thicknesses of the coal-seams are much the same at both places, the intervening strata have thinned to the north, thus, 140 feet and 197 feet, or a total of 337 feet, become 60 feet and 42 feet, or a total of 102 feet, showing a reduction of 235 feet. It would seem that this thinning process is continuous in a northerly direction, and in the Frank-Blairmore coal-field (adjoining the Crow's Nest coal-field on the north, and divided from it by the main range of the Rock Mountains), the productive thickness of the Lower Cretaceous measures is placed by Mr. W. W. Leach at 740 feet, with 125 feet of coal, thus showing a great thinning of both coal and shale.

**FRANK-BLAIRMORE COAL FIELD.** The Crow's Nest and Frank-Blairmore coal-fields are practically one coal-field separated by great upheavals, foldings and crushings of the strata.

<sup>†</sup>"Summary Report on the Operations of the Geological Survey for the Year 1900, by Dr. G. M. Dawson, *Annual Report of the Geological Survey of Canada*, 1900, 1903, vol. xiii., section A, page 87; and *Ibid.*, 1901, 1904, vol. xiv., section A, Nos. 759 and 767, maps.

\**Trans. Inst. M. E.* 1905, vol. xxix., page 56.

From the "Loop," say, 3 miles east of Michel, the Devono-Carboniferous rocks forming the eastern boundary of the Crow's Nest Coal-field, are in evidence nearly as far as the eastern end of the Crow's Nest Lake, where there is a faulted contact with the Upper Cretaceous and Laramie measures. These measures continue for the next 4 miles, and are followed by beds of volcanic ash, agglomerates and Flathead shale beds, for 1½ miles, until the Lower Cretaceous coal-measures are again met with near Coleman. From Coleman to Frank the coal-field is very much disturbed, and at Frank the limestone is pushed right through the coal. At the western contact of these strata, there is a well-known sulphur spring, and at its eastern contact the coal-measures are turned up, and, in fact, partly turned over by the limestone upheaval. This vast intrusion of limestone on the north side of the railway is known as Bluff Mountain; on the south side as Turtle Mountain; and the space between, through which the railway passes, is known as the Gap. For about 4½ miles east of Frank, the coal-measures are disturbed and folded, and a fault forms the contact with the coal-seams and lignites of the Upper Cretaceous and Laramie measures. The Upper Cretaceous coal-seams have been opened up to only a very limited extent.

One of the most noticeable of the great disturbances and movements of enormous masses of limestone-rock in this district is clearly demonstrated by the position of the Crow's Nest Mountain, perched on the Upper Cretaceous measures, about 4½ miles north of the railway.

Other notable disturbances are common in the Alberta district of Canada, and an instance, near Banff, may be interesting, as the coal-measures there are based on the limestone and also covered with limestone, and the coal-seams are both bituminous and anthracitic.

**FRANK.**—At Frank, the coal-measures, as previously noted, have been cut through and tilted by the limestone forming Bluff and Turtle Mountains. An adit-level has been driven into the coal near the foot of Turtle Mountain, by the Canadian American Coal Company, Limited, to a coal seam from 12 to 16 feet thick.

Referring to the rock slide which occurred about 4 a.m. on April 29th, 1903, it is stated that the precise height of the mountain above the valley does not seem to have been known, but it was probably about 2,500 feet. There were no premonitory symptoms of a fall, and work was proceeding as usual at the mine.

So far as the writer knows, it is still an open query as to what set 500,000,000 cubic yards of limestone rock in motion. Several theories have been propounded, one of which was that there had been an earthquake but there does not appear to be anything to support this suggestion, any more than that at Lille, 4 miles to the north, and at Blairmore, 2 miles to the west, people were awakened out of their sleep by the noise and shock of the falling mass. Another theory was that water, formed from melting snow, had found its way to the base of the mountain and had thus formed a slippery bed, over which loosened rock, pressed down by the superincumbent mass above, commenced to move, and thus brought about the fall. It was also suggested that a hard night's frost, following a warm opening day of spring, was the force which set the mass in motion. Many other theories have been suggested, but they are quite outside the possibilities of the occurrence. The writer thinks is the Cretaceous rocks had been weakened and broken by upheaval and exposure on both sides of the outcrop of the coal-seam, that the removal of the coal had the same effect

as taking out a sprag from underneath the foot of Turtle Mountain, and that the movement was thus originated. It may be observed, however, that the damage done within the mine was very slight, excepting near the entrance.

The adit-level has now been reopened, and a pit has been sunk near the Gap; and supposing that the working of the coal-seam from the adit-level was the disturbing cause of the disaster, it appears possible, if not probable, that at some future date the disaster may be repeated, and the whole of the remaining portion of the town of Frank might be swept away. The number of empty houses in the town is sufficient evidence to a stranger that the miners of the district have not recovered sufficient confidence in the stability of the face of Turtle Mountain, to take up their residence beneath its shadow.

### CONCERNING MINING TITLES IN ONTARIO.

#### THE ARGUMENT OF J. M. CLARK, Esq., K.C. AGAINST AN APPLICATION FOR A FIAT. JUDGMENT GIVEN FOR DEFENDANTS.

It is in the first place to be observed that this matter should be dealt with under the provisions of the Mines Act as it stood at the date of the lease to the applicant. This is important in view of the fact that the Inspector appears to have confused the position of a Lessee with that of a Licensee under the regulations governing Mining Divisions, for he reports as though he were dealing with a mining claim in a Mining Division and not with a lease under the Mines Act. The Mining Division at Cobalt was only set apart on the 5th of April, 1905 and when so set apart the claims in the Mining Division become subject to very wide and extensive powers of regulation by the Government. On the contrary the provisions of the Mines Act in regard to leases apply to the whole of the Province with the exception of the lands covered by Mining Divisions, that is at the time of this lease the whole of the Province of Ontario except the Michipicoten Mining Division.

It is next to be pointed out that in this case there is no question but that the application of the Applicant and the affidavits filed in the Department in support of his application before the lease was issued to him were bona fide and in all respects regular.

No case is made out for attacking the lease. It is suggested that it would not pay to work galena but such a test is not at all justified by the wording of the Act which requires the discovery of valuable ore or mineral. Galena is well known and recognized as a valuable ore or mineral and is in fact the usual ore of lead. In reference to this it is sufficient to point out that the reports of the Department of the Bureau of Mines have recognized galena from year to year as a valuable mineral. It is suggested by the Inspector that this galena would not pay to work unless accompanied by silver, but in the Bureau of Mines Report for 1899, Vol. VII, p. 32, there is an account of a galena deposit which is referred to as quite promising. It is described as "galena associated with gangue of calcite. The galena is non-argentiferous or practically so." This report was distributed with the sanction of the Government and the Legislature.

Parties dealing with the Government were entitled to rely on this and on the interpretation of the Act adopted by the Crown Lands Department until long after the issue of this lease. Any new interpretation should not, it is submitted, be in any event invoked

to defeat vested rights bona fide acquired before such new interpretation was heard of.

The Complainant in this case has clearly no Status. He is a trespasser, a mere volunteer. At the time of the issue of the lease he had no interest whatever in the property so leased and for reasons ably pointed out by Chief Justice Robinson in *Bolton v. Jeffrey*, 1 E, & A 111, great inconvenience would arise if "when no fraud, misrepresentation or concealment is imputed to the Patentee" titles could be attacked. The Chief Justice in that case also points out that such an instrument as that now being attacked either in the shape of a lease or a grant in fee simple lies at the root of every man's title in this province. The above language was quoted with approval in *Henderson v. Westover*, 1 E & A 465 at page 483. In view of the great experience and learning of the eminent and able Judges whose decisions are above referred to it is respectfully submitted that their views which hitherto have never been questioned should be acted on in the present case by refusing to attack the said lease.

The case against interference is greatly strengthened by the fact that in the letter of the Applicant to the Crown Lands Department of December 10th, 1904, he said "Kindly let me know if there is anything else necessary to be done in connection with the taking up of the above lot at the present time and greatly oblige." Subsequently and with this letter before them and also the fact that the affidavit showed a discovery of "galena" the whole matter was investigated by the Department and a formal report made by the proper officer dated the 3rd of January, 1905, and the formal ruling granted for the issue of the lease. The Crown accepted the first year's rental at that time and subsequently the second's year rental, and where as in the present case no imposition on the Government is suggested much less proved it is submitted that the lease should not be questioned by the Crown.

It is to be observed that the Mines Act does not require ore or minerals to be found in place although this is or may be required by the Regulations applicable to Mining Divisions. All that is required is that there should be an affidavit showing the discovery of valuable ore or mineral on the property applied for.

The construction sought to be placed upon the Act in the present case was discussed by a very able and experienced Federal Court of the United States in *Book v. Justice Mining Company*, 17 Morrison 617, where as in the present case it was sought to show that to constitute a discovery ore which would pay to work must be shown. The Court therein giving judgment at page 644 said "If this view should be sustained it is manifest that it would lead to absurd, injurious and unjust results destructive of the rights of prospectors and miners" etc.

It is well known that at the surface of the Anthracite Mines of Pennsylvania the coal is so mixed with country rock that it would not pay to ship and if the view contended for in the present case, therefore, were to prevail the person making such a discovery would not be protected because they would have to sink several hundred feet before mineral which will pay to ship is obtained. The same thing applies to many probably most discoveries of iron ore. In fact if the view above referred to prevailed all the locations of the iron ore deposits on the celebrated Vermillion range in Minnesota would be invalid. This is specially referred to because the authorities of Ontario have for several years been holding out that in Ontario there are formations similar to those on the Vermillion

range. If a prospector or explorer finds such ore it is submitted that he has made a discovery of valuable ore or mineral and the fact that at the surface the iron ore is so intermixed with country rock that it would not pay to ship would not invalidate the discovery.

Strong hopes have been officially held out by Ontario that a copper mining industry might be developed in this Province and the importance of such an industry can hardly be exaggerated. It is well known that it takes hundreds of thousands of dollars to find out whether a copper property will pay to work or not. One practical man said it takes at least two million dollars to make a copper mine. If, therefore, a lease such as the present is open to attack on the grounds suggested it would obviously be quite impossible to commence copper mining in the Province.

Reference is also made to the judgment of Mr. Justice Street in *Ontario Natural Gas Company v. Smart* 19 *Ontario Reports* at 591 where after discussing the decisions he says "I think myself bound by the authorities to give to the word (mineral) when used in this Act its widest signification." This judgment where natural gas was held to be a mineral was confirmed by the Court of Appeal 13 *Appeal Reports* (1891) 626. It is submitted that this rule of construction so enunciated by our Courts should be followed in the present case and the application for a fiat dismissed.

The general principle is also referred to that in order to set aside a title such as the present where it is under the Great Seal of the Province testimony to impeach it must be clear, unequivocal and convincing of which class of testimony there is in the present case no trace whatever. No evidence is adduced even tending to prove that this lease was issued "erroneously or by mistake or improvidently or through fraud."

It is specially submitted that persons dealing with the lessee should be protected. The Crown having granted this lease and it being clear that to use the language of Chief Justice Robinson "no fraud misrepresentation or concealment" can be imputed to the lessee it is submitted that the Crown should do nothing to derogate from or destroy its own grant. On the contrary it is submitted that the prerogatives of the Crown should be exercised for the protection of the rights of the lessee and those bona fide claiming under him.

It has been well said that the highest security a British subject can have is the honor of the Crown which as the maxim runs can do no wrong.

This security the Defendant and those dealing with him had in the most solemn form under the Great Seal of the Province of Ontario.

If such a title as the present is open to attack it would be a serious blow to the credit of the Province. It would render prospecting and exploration so hazardous and uncertain as to paralyse the Mining Industry of the Province.

All of which is respectfully submitted.

#### THE AMENDMENT OF THE ONTARIO MINES ACT.

To The Editor.

Sir, - Of the matters which will come under consideration at the Mining Convention to be held in Toronto on 12th December, the view point of some delegates will be that an open door should be given for the most extensive acquisition of mineral territory by capitalists and prospectors. Large territories heretofore granted to companies and private individuals

have not returned, nor are they likely to yield, dividends. Tracts, really vast, were sold in Algoma and Thunder Bay Districts many years ago which came into the market again under Tax Sales, and are liable under recent legislation to be forfeited to the Government for large accumulations of taxes. Over some of these tracts much superficial prospecting has been done, with no result in the development of any large mine. Much information has been acquired showing that the first purchase of the land was wholly unwarranted; that a large amount of capital has been diverted into profitless expenditures, and that the interests of mining enterprise have suffered in consequence. No argument is needed to sustain the proposition that it is the duty of the Government as trustee of the public lands to arrest by all means in its power the reckless purchase of mineral territory by corporations and individuals for the mere purpose of speculation. Otherwise, morally speaking, the Government might as well enter into lottery enterprise. Every dollar expended in mineral property which does not bring profit to the investors through the employment of labor, is so much withdrawn from the fund available for sustaining the industries of the Province.

For consideration of the Convention I offer the following subjects wherein the Mines Act may be amended for the public benefit:—

1st.—It is admitted that it is debatable whether the grant of free miners' licences shall be subject in Ontario to the restrictions which apply to the grant of mining lands in the United States. Under United States' law mineral lands of the Federal Government are open to "occupation and purchase by citizens of the United States and those who have declared their intention to become such." Corporations entitled to acquire Federal (U.S.) lands must be such as are incorporated within the Union. In Ontario foreign corporations must obtain a license to acquire mineral lands. Having regard to the preservation of the forest, a register should be kept of all persons engaged in prospecting, and with this view the restriction of the grant of mineral licences to citizens by birth or naturalization will be a safeguard. Individual capitalists and corporations may easily circumvent the restriction of their operations to limited areas by employing parties of licensed prospectors. The Mines Act should be amended to require from every free miner a declaration whether he is an employed miner or working on his behalf. Where discovery is made by an applicant for a mineral claim the affidavit of the applicant should show whether the application is made independently or in trust for another, and if so for whom. The contention appears well founded that the applicant should not be required to produce the testimony of two persons as to their ignorance of any prior discovery. The investment of company capital will not be at all affected by the suggested amendment, inasmuch as a United States incorporated company may acquire land, having first obtained a license. There should, however, be a provision similar to that of New York State law, that every foreign mining company operating in Ontario should have at least one British subject on its Directorate. The Ontario Companies Act makes Directors liable for wages, but this protection is a barren one where employers consist of a foreign corporation whose directors are all resident citizens of a foreign country.

2nd.—The regulations of the Mines Act now applying to the Michipicoten and Rainy River Divisions should be extended to all the free grant townships with necessary limitations for the protection of land occupied for



farming purposes and especially land under timber. The clauses for the latter purpose cannot be too strictly framed. The preservation of the forests is as important to the mining as to any other industry in Ontario. The operations of prospectors should not be extended beyond the surveyed districts of the Province. There is ample area available for all the enterprise that may be attracted hither. The energies of ambitious adventurers may well be restrained within such limits as will ensure practical benefit to the settled portion of the community bearing the burden of taxes, the extension of transportation facilities and municipal administration. The large surveyed mineral areas outside of municipal boundaries in the Districts of Algoma, Nipissing, Thunder Bay and Rainy Rivers are of very little value to the Province. There the mining interest maintains no municipal system for the protection of private interests, no resident magistrates or constables for the protection of the forests. Mineral areas have been plundered of timber to a large extent. And all through the greed of individuals to acquire for speculative purposes large areas which they were financially or otherwise unable to develop.

3rd.—Royalties on other ores than those of gold and silver do not appear in the present state of mining development to be at all justifiable, and on gold and silver only to be commendable when the mines are productive of profit. There might be a sliding scale of royalty on large dividend-earning producer where the output as in the case of some Michigan and Wisconsin iron mines extends to many thousands of tons per year. The profitable exploitation of ores of zinc, lead and copper has not yet been attained in Ontario, and until the problems of reasonable transportation cost and cheap smelting have been solved the struggling industry of mining these ores at a profit should be allowed every possible advantage. It is however, beyond question that no royalty should be based on gross returns, but solely on the profit from mining operations. This proposition has recently been discussed in Cornwall, England, where it has been shown that a royalty of  $5\frac{1}{2}\%$  on tin ore was equal to  $50\%$  of the profits earned by the Dolcoath Mine.

4th.—Objection has rightly been taken to the power of the Inspectors of mining divisions to disallow applications where in their judgment there has been no valuable discovery of ore. While there should be free and unrestricted license to carry on mining operations for proving or disproving an alleged discovery, the grant may well be limited to short periods and subject to the pursuit of actual mining operations. Equality of rights of citizenship demands that the public domain shall not be thrown open to unrestricted blanketing operations by large corporations and plutocratic individuals. The pursuit, however, of alleged discoveries may well be allowed to those who stake their faith in their ability to follow a lead or a prospect shown by actual labor. A period of three months cessation of work might be allowed to enable a discoverer to get assistance to carry on his work, but this should be guarded by declarations of individual ownership, and the right might be made assignable on the expenditure of \$100 in labor on the property.

5th.—The registry law both in the mining divisions and in the County registries should provide for the full registration of every document affecting title. At present no grantee or lessee is under any obligation to register his grant or lease. Before issuing the document the Department of Mines may easily require the registration of the instrument and collect the fee therefor. Blank books could be supplied to registry offices to effect this object.

6th.—Large powers should be taken by the Mines Department for carrying on metallurgical operations in mining districts. No better mode of stimulating metallurgical discovery can be employed than the engagement of experts in experimental work in the reduction and smelting of ores, giving the public the benefit of their researches, and affording opportunity for the scientific investigation of the difficulties that present themselves in every mining region in the reduction and smelting of minerals. Efforts put forth to levy tribute on the mining industry of the country by means of the control of smelters and smelting processes may be met in the mode recommended, and with lasting benefit to the community.

New South Wales has entered into a contract with an iron master for the erection of a furnace and iron mill to be operated with native coal and ores. Here the large Dominion bounty of \$2 a ton on iron made from foreign ores has not been favorable to the development of Ontario iron mines. The foreign furnace managers regard the hematites they have been trained to use with greater favor than native magnetites for the use of which their furnaces would earn a bounty of \$3 a ton. And yet Sweden leads the world in the quality of its iron made from roasted magnetite ores similar to those of Ontario. The recent experiments with the electric furnace may divert attention from the ancient manufacture of the best pig iron with charcoal fuel. It will be some time, however, before the public will derive any material benefit from the electric method which seems destined to be of more value for the manufacture of refined ore and steel than for making foundry iron. The iron ores and hardwood forests of New Ontario can be brought into vital relationship with the railway progress of to-day by the erection of a Swedish charcoal iron plant and the importation of Swedish workmen to manufacture car wheels and railway castings. Such an enterprise will do infinitely more to lay the foundation of permanent thriving settlements than the sale of extensive iron ranges to foreign syndicates and the export of millions of tons of ore from the iron treasures of the Province.

Let the Act be amended, however popular agitation may direct, there will remain discussion, litigation and unsettled ideas until once for all it is accepted that no title in fee should hereafter be granted for mineral property of the Province. All grants of mines of any nature should be conditional upon their exploitation and development. Of no other property can it be so clearly stated as of mineral ores that their value depends upon use and when no use occurs no value is found. The total value of the gold production of the world is ascertained to be slightly less than its cost. Silver costs much less to produce it than half a century ago was the case, and the result is a great diminution in value which is likely to grow in downward ratio with the development of the New Ontario silver mines unless the expansion of Japanese trade in the East shall increase the demand for silver currency preferred by Orientals. Even iron owes to demand for its use those remarkable fluctuations which are expressed in the phrase that "iron is either a king or a pauper." The State has now in its power to avail itself of the increment of value due to public use by requiring that this element shall not be affected by non-user, that is to say that miners shall not keep mines inactive, but that, making reasonable allowance for financial stringency such as may extend over a period of two years, every mining property shall revert to the State if suffered longer to remain unproductive. It has been advocated that existing mineral grants, whether mineral of



economic value has been granted or not, should be taxed for municipal purposes. The road to municipal "graft" on this line is easy, and familiarity with confiscation by means of taxation placed within municipal control is not good Socialism. Nothing, however, but good can come of requiring that all grants or leases hereafter shall be vital only so long as they are occupied and used. What a stimulus to activity this would be! What a hindrance to rash speculation! What a source of benefit to investors! What a hum would be heard throughout the mining districts! The miners would benefit by steady employment. Manufacturers of mining machinery would not have to send out drummers for orders. Instead of sending ores abroad for concentration and reduction the country would rapidly enter the world's market as a producer of metals, and this for the reason that a steady supply of ores would in the nature of things lead to the erection of reduction and smelting works which will never be the case so long as the supply of ores is as now precarious and uncertain.

J. B.

### "WHY THE MINERAL INDUSTRY IN ONTARIO HAS NOT MADE GREATER PROGRESS?"

A Mr. T. M. Kirkwood, writing to the *Toronto News*, asks the question "why the mineral industry in Ontario has not made greater progress?", and offers as an explanation, the difficulties placed in the way of the prospector in securing title to mineral areas. As an example he cites his own case.

So long ago as March, 1903, he applied for 160 acres of land on Mettagami River, and was told by the Department that this section of the Province was not open for sale or exploration for mining, and that his application therefore could not be entertained. Later in the year he applied again to the Department, and received the same reply. In September of 1905, another application was made for this land, which had been located as an iron property, and was informed by the Department that his application be made to cover land, on which it had been reported there is a deposit of lignite, and that he had filed no affidavit of discovery in respect to the iron deposits. Mr. Kirkwood adds that he was fully prepared to have this property surveyed and to make affidavits of discovery directly he had the assurance of the Department that his application would be favourably received, and he concludes his letter by stating his belief, in which many will be found to agree, that all mineral areas in Ontario should be open to the prospector, for unless proper encouragement is given to the prospector, there can, of course, be no mining development.

### THE LE ROI AMALGAMATION.

We learn that two of the Canadian Companies proposed to become amalgamated with the Le Roi Company have sanctioned the scheme, and in consequence the Le Roi meeting will be held in the early future. Meanwhile the secretary of the latter company has issued a memorandum to shareholders replying to Mr. McMillan's circular of 31st October, in which it appears to us the arguments of that gentleman are very effectually disposed of. The circular states that the Board regret that they have not been able to call a General Meeting of the Shareholders in Le Roi Mining Company as soon as they expected, in consequence of unforeseen delays in regard, especially, to the holding of the meetings in Canada of the other Companies interested. They have however learnt by cable that Mr. Mackenzie, having, on behalf of this Company, inspected the properties proposed to be amalgamated, mailed his report on the 20th October, and that the meetings of the Canadian Companies will probably be held on or before the 14th Novem-

ber. On receipt of Mr. Mackenzie's report, and on learning the results of the meetings of the other Companies interested, they will at once take steps to issue their report and call a General Meeting of the Le Roi Shareholders. The properties referred to by Mr. McMillan, examined between October, 1904, and January, 1905, are not all the same as those now proposed to form a new combination, and further examination was therefore required.

Mr. McMillan states in his present Circular that he has obtained in the United States Courts an injunction to prevent the removal of valuable machinery from the Northport Smelter until a meeting of Shareholders can be held. If so, this was a most unnecessary proceeding, inasmuch as there has never been any intention of doing more than "cleaning up" with a view to recover from the surroundings of the smelter the values which are deposited there as the result of smelting operations.

Mr. McMillan states on the question of a dividend, "I do not see any difficulty about the matter at all, unless the available funds have been used for other purposes since I left the Board," which he did at the end of August. It is only right to say, therefore, that the available cash balance at that time was £1,309 in London. There was then owing to the Bank on account of advances, demand notes, and interest, £27,775. As stated, therefore, previously by the Board, a dividend could only have been paid by further borrowings from the Bank on Matte in transit.

As regards the matters referred to by Mr. McMillan, the Board cannot do better than forward for the information of the Shareholders the following extracts from letters which they have recently received from Mr. Mackenzie. These show plainly how unfortunate for the Company has been Mr. McMillan's recent administration of its affairs, how little to be depended upon are his statements in regard to his officials, and how small a chance there would be of any profit for the Shareholders if its management were again confided to him.

September 22nd, 1905.

"There is one subject I wish to call your attention to

" . . . . . and that is the Ore Reserves in the Le Roi.

"Since I first saw the Mine they have never been as low as at

"present, and if amalgamation does not materialize, your

"Company will have a tremendous amount of development

"work to do this coming year . . . . . It is a fact that

"not sufficient development work has been done in the last

"year to keep up the Ore Reserves."

September 30th, 1905.

"As the matter now stands the Contract with Trail

"would have saved your Company \$109,579.47 if Northport

"had been shut down a year ago."

October 4th, 1905.

"When I have completed the St. Eugene and Trail Smelter

"examination will be time enough to relieve Mr. Astley,

"although he is not feeling well, and is anxious to reach a

"warmer climate. Regarding Trevorrow, I believe he has

"worked hard and faithfully for your Company; in fact he

"has done everything underground without help or advice."

October 19th, 1905.

"On talking to Mr. Trevorrow to-day concerning his

"connection with amalgamation, I was very much surprised

"to find that Mr. Astley was absent and sick in Spokane at

"the time Mr. Trevorrow made an examination of the War

"Eagle and Centre Star. Mr. Trevorrow states positively,

"and will write me a letter to that effect, that he was never

"consulted about amalgamation in any way whatever, was

"not asked, and never gave an opinion to Mr. McMillan or

"Astley about amalgamation."

As regards the Concentration Mill which has been erected

by Mr. McMillan during the past year and upon which the estimated expenditure has been largely exceeded Mr. Mackenzie writes under date October 19th, 1905:—

"I have shut down the experimental concentrating plant,

"as it is not adapted for the work required. As a matter of

"fact it is not a copper concentrator but a copy of a lead con-

"centrator plant located in Idaho. There are two leading

"factors to be considered in the successful concentration of

"copper ores by water. The first is proper classification.

"and the second, that the pulp should be of the proper con-

"sistency when it reaches the tables. If you will look at our

"report on the concentration of Le Roi ores dated September

"5th, 1904, you will note that Bradley and Mackenzie recom-

"mended that great care should be taken in selecting a suit-

"able system of classifying and settling tanks, and stated as

"our belief that the Sherman system would be the most

"suitable. No attention has been paid to this warning, and

"the plant has been built without a proper system of class-

"ification. So much water is added to the pulp in the different

"stages of crushing, jigging, elevating, etc., that when the

"pulp reaches the concentrating tables it is not in proper

"condition to treat successfully. No provision has been made

"for thickening this pulp, and the result is the values are

"washed away by an excess of water."

"You will also remember that Bradley and Mackenzie recommended using the present Le Roi picking tables, crusher plant, aerial tramway, ore bins, etc. This advice has not been followed and ore that should be hand sorted and go direct to smelter is allowed to pass into the concentrator causing an excess of slimes which are lost in the tailings. Instead of taking advantage of the ample appliances of the Le Roi plant for handling the ores, the concentrator was placed on an almost level site that compels the use of expensive elevators and the costly method of trampling all the concentrating ore through the Black Bear tunnel.

"Mr. Thomas Mitchell, who designed and built the plant, was brought here by Bradley and Mackenzie as a millwright and not as an expert on copper concentration. In fact Mitchell has never had any previous experience in designing plants for the treatment of copper ores."

"After making my report in September, 1904, I especially cautioned your Managing Director, Mr. McMillan, against trusting to the advice of Mitchell because the latter gentleman knew nothing about the difficulties of concentrating Rossland ores. It is only necessary to point out Mitchell's estimate of this experimental mill and compare it with the actual cost in order to arrive at a true estimate of his ability and judgment; estimates were \$13,000.00 for a complete plant, while the actual cost has exceeded to date over \$30,000.00.

"In the face of Bradley and Mackenzie's advice Mr. McMillan chose to follow the lead of Mitchell, with the result that the experiments prove nothing, the money expended is practically wasted, while radical changes will have to be made in the plant before experimenting further."

Mr. McMillan's management has thus been unfortunate for the Le Roi Company in the following respects:—

1. A direct loss of \$109,579 in one year by continuing to use the Northport Smelter against the advice of Messrs. Bradley and Mackenzie.

2. Employing for twelve months a Superintendent physically unable satisfactorily to perform his duties.

3. Expending to date over \$30,000 in fruitlessly experimenting on water concentration without proper advice and in disregard of the warnings plainly given to him by Messrs. Bradley and Mackenzie.

4. Failing to maintain development whilst extracting profitable ores, the result of previous development, as testified by his own foreman, Trevorrow, who was practically the only expert under him able to superintend the workings, and who is not, as Mr. McMillan asserts, opposed to amalgamation.

The profit made by Mr. McMillan during the year—which it must be understood did not exist at the end of the year in the form of cash—was most unsatisfactory for the following and other reasons:—

1. The substitution of the Tacoma Contract in place of the New York Contract for the treatment of Matte yielded an advantage of about \$53,000.

2. The enhanced price of Copper gave an advantage of about \$34,000.

3. The decreased price of Coke gave an advantage of about \$11,000.

4. The fact that he has shipped the best ore available without maintaining the Ore Reserves or expending a sufficient amount on the necessary development of the Mine.

Compared with the facts and circumstances of the case the pretensions of Mr. McMillan as to his success in the management of the Le Roi Mine in the past as well as his representations as to its existing conditions, and the expectations which he endeavours to raise in its future prospects under his management without amalgamation, are not merely misleading but are simply ludicrous.

## SOME RECENT MINING AND METALLURGICAL PATENTS.

(Specially Reported for the MINING REVIEW.)

799,021—Ore-Concentrating Table. Alexis Tetrault, Denver Colo., assignor of one-half to Edwin C. Pohle, Denver, Colo.

In an ore concentrating table, a foundation-frame, a table having V-shaped bearings on its under side, pairs of pointed rock-arms engaging the grooves of said bearings, a pair of beams supporting said rock-arms, means for adjusting said beams at the feed end of the table, guide-brackets within which both ends of said beams are loosely placed, means on the beams engaging said brackets to prevent said rock-arms from slipping out of the table-bearings, and means for reciprocating said table.

798,843—Dry-Ore Concentrating Table. Alexis Tetrault and Edwin C. Pohle, Boulder, Colo.

In a dry concentrator, a quadrilateral smooth-surfaced table a cover therefore supported at a distance therefrom to form a chamber leaving openings across three edges of the table the openings at two of said edges being for the inlet and for the outlet of air-currents, the other for the discharge of the concentrates, a closure for the fourth edge of said table-chamber, a feed-hopper opening for the fourth edge of said table-chamber, a feed-hopper opening into the table-chamber on its closed side, means to draw air into, through and from said chamber between the feed-hopper and the delivery-opening and means for imparting reciprocating bumping movements to said table.

799,548—Process of extracting gold from its ores. Friedrich W. Dupre, Leopoldshall, Germany.

A process consisting in subjecting the ores to the dissolving action of aqueous solutions of cyanids in the presence of alcohols.

799,161—Gold Saving Machine. Jonas B. Holmes, Los Angeles, Cal., assignor to Holmes-Bowman Dry Placer Mining Co. a Corporation of Arizona.

In a placer gold-separator; a separator box pivotally supported in bearings; means to give said lateral reciprocatory movements and means to cause the alternate elevation and depression of the ends of said separator-box, each end being alternately higher than the other end.

799,743—Process of treating zinc ores. Philip A. MacKay, Wenona, Ill.

A process which consists in subjecting the ore to a dead roast, whereby the zinc sulfid is oxidized and the cadmium sulfid converted into cadmium sulfate, thereafter dissolving out this deleterious sulfate and then grinding and distilling the remaining zinc oxid to obtain therefrom the pure refined zinc.

799,745—Metallurgical Furnace. Philip A. MacKay, Newcastle, New South Wales, Australia.

A metallurgical furnace comprised in a unitary structure, the combination with parallel passages or chamber extending longitudinally along the center of the furnace, regenerative furnaces extending longitudinally along the sides of the furnace, passageways connecting the regenerative furnaces with the parallel chambers, partitions between the chambers, each partition being hollow to form a left and right reduction-chamber having thin walls, oxidizing-chambers extending longitudinally over the regenerative furnaces one at each side of the structure, passage-ways connecting the left reduction-chambers with the left oxidizing-chamber, passage-ways connecting the right reduction-chamber with the right oxidizing-chamber, an opening in the top of each reduction-chamber for receiving the products to be treated, a passage way below each row of reduction-chambers, and a trap-door at the bottom of each reduction-chamber by means of which the products of each of the reduction-chambers may be conveyed to each of the passage ways below the reduction-chambers.

799,862—Process of separating ferriferous zinc compounds. Guy L. Meaker, Evanston, Ill., assignor to The American Steel & Wire Company of New Jersey, a Corporation of New Jersey.

A process of separating ferriferous zinc compounds by rendering the iron component neutral to the electrolytic action the method of oxidizing the electrolytic solution which consists in giving the anode an active surface larger than that of the cathode.

800,370—Magnetic Separator. Charles M. Green, Lynn, Mass., assignor to General Electric Company, a Corporation of New York.

In a magnetic separator, a frame, a magnet mounted thereon comprising two similar interlocking core-bodies having pole-pieces formed thereon, a coil inclosed by said core-bodies, means for connecting the coil in circuit, a hopper for feeding material to the magnet, and a revolving brush for removing magnetic material from said magnet.

800,588—Roasting Furnace. August R. Meyer, Kansas City, Mo., assignor to The United Zinc and Chemical Company, Kansas City, Mo., a Corporation of New Jersey.

A furnace having side and end walls of masonry and external buttresses, at the opposite sides connected by cross-beams, which arches extending from end to end and a plurality of hearths above each arch, other arches arranged below the hearth-arches to form intermediate flues, said flues connected in series, and a plurality of shafts and rabbles carried thereby to sweep over the different hearths.

- 800,378—Amalgamator. Henry L. Lichtner, San Francisco, Cal., assignor by direct mesne assignments, of one-third to William Priest and one-third to Henry Feige, San Francisco, Cal.  
The combination in an amalgamator of a circular amalgamator concave surface, means for supplying pulp and water upon the central portion of said surface, and an air-blast apparatus having radial outlets capable of discharging jets directly upon said surface in a downwardly and outwardly direction whereby pulp is carried up the incline and the waste is delivered over the outer edge thereof.
- 800,148—Smelting or Melting Furnace. Arthur B. Griffen, Verona, N.J.  
A furnace comprising a tiltable body provided with two chambers arranged in horizontal line, one of said chambers constituting a preheating-chamber, and the other an augmenting-chamber, a vertical partition between the two chambers having an eccentric opening for establishing communication between the two chambers for the passage of flame or gases when the furnace-body is in its melting position and for establishing communication between the chambers for the passage of molten metal from the preheating-chamber to the augmenting-chamber and for closing off said communication when the furnace body is tilted for pouring.
- 800,857—Electric Furnace. Frederick A. Kjsellin, Saltsjobaden, Stockholm, Sweden.  
The combination of an annular furnace-chamber, an iron core, surrounded by it, an induction-coil, and double-walled metal-sheet jackets being adapted to be passed by a cooling medium and on their whole length being provided with at least one interruption of non-conducting material.
- 801,703—Coal Washing Apparatus. John Anderson, Peoria, Ill.  
The combination of a rotatable cylinder having open receiving and discharge ends and consisting of sections containing perforations increasing in size from the receiving to the discharge end of the cylinder, a perforated trough surrounding the lower parts of said cylinder and located only beneath said sections having the larger perforations, and conveying-chute leading from said trough.
- 801,600—Thomas S. Miller, South Orange, N.J.  
In a conveyer, in combination a trackway, a carriage therefore, a hoisting-cable, a yielding support for said cable upon the carriage, a movable brake to engage the trackway, and connections from the brake to the yielding support for the hoisting-cable normally holding the brake out of action whereby the brake is applied by the load.
- 801,349—Ore Separator. Lois J. Vandervoort, Guthrie, Okla.  
An ore separator, comprising a sluice-box provided with a flexible bottom having a plurality of transverse discharge-openings, closures for said openings, beaters arranged at intervals under said bottom, and means for operating said beaters.
- 801,947—Magnetic Separator. John P. Wetherill, South Bethlehem, Pa. and Henry A. J. Wilkens, New York, N.Y., assignor by mesne assignments, to Wetherill Separating Company, a Corporation of New Jersey.  
A magnetic separator for materials of low magnetic susceptibility, comprising a series of magnets having highly-concentrated magnetic fields, a series of feed-belts for the several magnets respectively said feed-belts discharging the one upon the other, a receiver for heads in proximity to the concentrated field of each magnet, and a cleaner belt running past the magnets in the same general direction as the feed-belts.
- 802,229—Conveyer. Ovid D. Moses, Chicago, Ill.  
In an apparatus, a main frame, adjustable legs secured to and supporting said frame, casters pivotally mounted in said legs, an endless conveyer mounted on said frame, and means for driving said conveyer.
- 802,012—Method of separating nickel and copper sulfids. Ambrose Monell, New York, N.Y.  
A method which consists in adding to a matte containing such sulfids, a material which is solvent for some of the sulfids therein, heating the mixture to the point of fusion of said solvent, maintaining the mass in fusion until substantially all of the soluble sulfids have been dissolved, and allowing the undissolved sulfid to settle and separating it from the dissolved sulfid or sulfids.
- 802,242—Metallurgical Filter. Emma Stewart, Colorado City, Colo., administratrix of Charles Mannel, deceased.  
A filter, comprising a rotatable shell, longitudinal, spaced ledges within the shell, filter-plates secured upon the ledges, the shell beneath the filter-plates being perforated, and decanting-pipes having heads with which said perforations communicate in series.
- 802,779—Centrifugal Ore-Separator. Wilbur H. Peck, Chicago, Ill., assignor by mesne assignments, to Title Owners Company, a Corporation of Maine.  
The combination of a rotatable treatment vessel having a separating surface therein, an expandible and contractible deflector within the vessel having sections provided with channels adapted to receive retaining devices and a removable flexible covering around said deflector, having retaining devices with one of their parts embedded in the covering and another of their parts removably engaging said channels.
- 802,374—Actuating mechanism for ore-concentrators. Emil Deister, Fort Wayne, Ind.  
An actuating mechanism for concentrating-tables and similar devices, a table suitably mounted to be vibrated; a bracket fixed to said table; a block adjustably seated against said bracket; bolts having loose connections with said block and rigidly fixed in said bracket; springs in connection with the respective bolts and acting against said block towards said bracket; a reciprocating driving rod having a sliding connection with said block; a buffer having actuating connection between said driving-rod and block; and a spring in connection with said driving-rod and acting against said bracket.
- 802,724—Centrifugal Concentrator. Phineas H. Adams, Chicago, Ill., assignor by mesne assignments, to Title Owners Company, a Corporation of Maine.  
The combination of a rotatable treatment vessel having a separating surface therein, a core therein forming a covered separating channel or passage for the flow of material over said surface; means for employment of water whereby material can be removed from a desired portion of such surface around near its discharge end, and means in part rotatable with said vessel, for preventing water from flowing up into said channel beyond a predetermined distance during said removal.
- 803,150—Coal Screen. Henry Duggan, Toluca, Ill.  
A coal screen consisting of a single piece of sheet metal, a plurality of parallel steps formed therein, flat surfaces being provided between said steps, said flat surfaces having elongated transverse openings formed therein of less strength than said surfaces, whereby a flat surface is provided upon the upper end and the two sides of each of said openings, said openings terminating at the bottom of said steps.
- 803,472—Extraction and purification of zinc. Alfred V. Cunningham, Winnington, England.  
A process of obtaining a zinc salt from ores containing zinc which consists in stirring them with a solution of a zinc salt together with the acid which forms that salt the solution being kept about neutral and finally separating the solution from the spent residue.
- 803,278—Artificial fuel and process for making. Andrew Engle, Metz, Iowa.  
A process for making artificial fuel, placing unslaked lime into night-soil and offensive combustible matter to absorb the moisture and destroy the odor and when the lime is slaked thoroughly mixing the hydrate produced by the lime with the matter deodorized by the lime, then adding about double the quantity of comminuted dry fuel to the product as set forth; then adding about two gallons of oleaginous inflammable matter, tar or the like, to about ten barrels of the product and thoroughly mixing it therewith to make it adhesive and plastic.
- 803,402—Conveyer. Thomas Cox, Portland, Oreg.  
The combination of a conveyer-frame-work of a conveyer-belt carried by said framework, fins projecting laterally from said belts in different longitudinal planes thereof, and supporting means arranged beneath said belt and positioned for contacting only with the edges and the intermediate portion of the return lap thereof and permitting the passage therebetween of said fins.

#### PLATINUM IN BRITISH COLUMBIA.

The *Inland Sentinel*, published at Kamloops, reports that during a recent clean-up at the Yale Hydraulic Mining Company's claim, at Yale, the black sand was found to contain platinum to the value of \$2.00 to the ton of sand. The clean-up, representing one week's work of ground sluicing, is said to have yielded 109 oz. of gold, while 600 lbs. of black sand was saved containing the platinum in question.

## RECENT PUBLICATIONS.

Part II of the Report of the Ontario Bureau of Mines for 1905, has been issued, and contains the most complete report yet published of the Silver-Cobalt-Nickel ores of the Temiskaming Mining Division of Ontario. Much of the material contained in the report has been previously printed in the Bureau's reports for 1904 and 1903, but the present pamphlet revises and corrects some data of the previous prints, and supplements them by a concise sketch of the foreign sources of Cobalt ore. Some few pages, five or six, contain a brief account of the Keewatin ore deposits, closely associated with these unique silver ores of the Lower Huronian, and there is no doubt but that this Part II will be very largely called for by investigators and investors as affording, in small compass, a synopsis of all that is known concerning Silver-Cobalt-Nickel ores at the present time. There is no mention of the metallurgy of these ores in this report.

The British Columbia Government is now taking active steps to advertise the mineral resources of that province, and the Bureau of Mines recently issued two bulletins, one of which, by the provincial mineralogist on the Windy Arm district, is referred to elsewhere. Bulletin No. 2, just issued, is a report by the provincial geologist Mr. H. Carmichael, on the Big Bend district, a section of British Columbia north of the Canadian Pacific Railway, enclosed by the Big Bend and Columbia Rivers, and having an area of, approximately, 2,300 square miles. This district was first visited by miners in 1865, when extensive placer operations were carried on. Since then it has been explored as well for lode deposits, and a number of promising locations have been made. The district however has suffered from the lack of adequate transportation facilities. The most important development properties are the J. & L. group and the Standard group, and the Keystone.

## NOVA SCOTIA MINING SOCIETY'S SEMI-ANNUAL MEETING.

The Mining Society of Nova Scotia held a very successful semi-annual meeting on Nov. 29th, the morning session convening at the Halifax Hotel, while the afternoon session took place at the Board of Trade rooms in that city. Among those present were the following gentlemen: Messrs. A. A. Hayward, President, H. Wylde, Secretary, G. W. Stuart, Charles Starr, B. F. Pearson, M.P.P., F. Ronnan, J. W. Austen, Hugh Fletcher, E. R. Faribault, Dr. Poole, Chas. Archibald, Prof. Woodman, M. Daru, of India; R. H. Brown, Prof. Sexton, H. Piers, Burritt, D. McDonald, J. A. Johnson, and others. The President, Mr. A. A. Hayward, occupied the chair. The following new members were elected: C. S. McLean, Assistant Manager of the Beaver Hat Mining Company, J. Owen James, W. H. Sterns, W. Cecil Parsons, Sydney E. Thomson, Alex. Stephen, J. J. Stewart and W. C. Milner.

The committee appointed to co-operate with the Provincial Government in securing the services of a gold mining expert to report on the gold fields of Nova Scotia, presented their report, and Mr. E. R. Faribault, who had accompanied Mr. T. A. Rickard on his tour of inspection, gave an interesting account of the itinerary. He stated that they had visited nearly all the important mining districts, including McTague, Waverley, Caribou, Renfrew, Mt. Uniacke, Dufferin and others. A vote of thanks was accorded Mr. E. R. Faribault for the excellent work he had done as a member of the Geological Survey for the mining industry of Nova Scotia. Interesting papers were read by Prof. Woodman, of Dalhousie University, on "The Iron Ore Situation of Nova Scotia"; by Prof. Leischman, "Contrasting Coal Mining Methods in England and in the Province"; by Mr. R. H. Brown, on the "Record of Bore Hole No. 1, Standard Coal & Railway Company," and by Mr. J. Owen James, on "Mining Investment." We propose in a future issue to publish these papers either *in extenso*, or abstracts thereof.

A resolution was passed empowering the Society to grant a scholarship of \$50.00 each year to a student in mining engineering at Dalhousie College most distinguishing himself in his third year course.

The matter of encouraging the development of the iron resources of the Province created a considerable discussion, and the following resolution moved by Ald. J. A. Johnson, seconded by Mr. George W. Stuart, was passed:

Whereas, this Society has been pleased to note from time to time the gratifying development in the manufacture of iron and steel in this Province and attribute the inauguration and success thereof largely to the very generous and liberal manner in which the same was encouraged by the tariff of Canada;

And whereas, this Society is of the opinion that the Government should at an early date take into consideration the renewal on a modified basis, adapted to its present requirements of the bonuses and protection hitherto enjoyed by that industry;

And whereas, notwithstanding the said encouragement this Society views with alarm the fact that our iron industries, built up by Canadian capital and Canadian bounties are entirely dependent upon an outside ore supply, and regrets that the development of iron mining in the Province of Nova Scotia has not proceeded *pari passu* with the development of the iron manufacturing industry;

Be it Therefore Resolved:

That this Society is of the opinion that in any future re-arrangement of the tariff with reference to protection of aid to arrangement of the tariff with reference to protection or aid granted to such industry, a proportionate share of such benefits should be apportioned in such manner as would stimulate and encourage the development of our home mines.

A committee composed of the following gentlemen was then appointed to seek the co-operation of the Provincial Government along the lines proposed: Dr. H. S. Poole, Professor Woodman and Messrs. J. H. Austen, B. F. Pearson and J. A. Johnston.

Dr. Robt. Bell, Acting Director of the Geological Survey, and Dr. Martin, formerly Provincial Engineer, were elected honorary members of the Society.

In the evening the members and several invited guests sat down to a very enjoyable banquet at the Halifax Hotel, covers being laid for forty-two. The menu was as follows:—

	Oysters on the Half Shell.	Olives.
Celery.	—	
	Mock Turtle aux Quenelles.	
	Baked Chicken Halibut à la Stanley.	
	Potatoes à l'Anglaise.	
	Roast Young Turkey, Cranberry Sauce.	
Mashed Potatoes.	—	Green Peas.
	Roman Punch.	
	Broiled Moose Steak with Jelly.	
English Plum Pudding.	—	Maraschino Creams.
Cheese.	—	Crackers.
	Frozen Pudding.	
	Coffee.	

Toasts to the King and President of the United States had been drunk with musical honours. The President proposed the toast of "Our Guests." This was responded to by Dr. Robt. Bell, the Hon. W. T. Pipes, Minister of Mines, Mr. N. D. Daru, an Indian geologist, and Mr. H. Mortimer Lamb, Secretary of the Canadian Mining Institute. Mr. Pipes, in expressing appreciation of the good work done by the Society in promoting the development and exploration of the mining area, stated that the Province owed much to the mining industry, from which it derived a very large proportion of its revenue, and the income from this source this year was greater than it had been last. He stated that the Government would be glad to act on the suggestion of the Society and appoint an expert to investigate the iron occurrences of the Province, and assured them that the Government of which he was a member would be always ready to hear suggestions from the Society, and to act, when possible, on the advice offered. In the course of the evening Mr. Fletcher was presented by the President, Mr. Hayward, with a handsome gold watch and a pocket aneroid barometer. In making the presentation Mr. Hayward said:—

"There are times when men engaged in the active pursuits of life find it necessary to pause—if but for a moment, and at such times, when the severe strain of competitive business life has been slackened and opportunities afforded to look back across the horizon; and while reviewing the past, there sometimes steals across man's better self the thought that perhaps, after all, the success he may have achieved is not altogether due to his own efforts; that behind the scenes there may have been some sincere, hard-working and thoughtful person who has, by his untiring energy, hewn out the pathway in which we have travelled; removed the barriers and quietly mapped out the way for us to tread; he has found the key, and unlocked the door to nature's storehouse, and, holding the door ajar, bids us enter. The wise have entered and returned fully laden from the harvest. And while we, tonight, gather round this festive board to do honour to our invited guests, we have much pleasure in selecting from among their number one whom we wish to especially honour—a gentleman who has, by his untiring energy and patience, been most successful in causing the unlocking of nature's secrets, and thrown open the door to those who wish to grasp the opportunity. I refer to Mr. Hugh Fletcher, of the

Geological Survey Department of Canada, who tonight occupies the position of the guest of honour, and to whom this Society and particularly those individuals and companies engaged in coal mining, wish to further extend their good wishes by the presentation of a little token of their regard and esteem. Mr. Fletcher, I therefore have much pleasure, on behalf of the Mining Society of Nova Scotia, in presenting you this watch and chain, also an anaroid, and may they remind you of the goodfellowship that exists, and I trust may continue between yourself and the members of this Society."

The watch and anaroid were handed to Mr. Fletcher amid cheers and the company sang "For He's a Jolly Good Fellow."

Mr. Fletcher in expressing his thanks referred to the mining possibilities of Nova Scotia, and said that he had now made the Annapolis Valley his headquarters, which he found to be the nearest possible approach to Paradise. After an admirable programme of songs and recitations a most enjoyable evening was brought to a close.

### MINING IN THE KOOTENAYS.

(From Our Own Correspondent).

Although the month has been quiet in mining circles, inasmuch as there have been no sensational developments, yet there has been accomplished much work in almost every district. Beginning with the Rossland camp it may be marked that the Le Roi concentrator has closed down, the management openly declaring that the constructor of that plant did not know what he was about. This was an open secret in Rossland. The trouble has been in Rossland, so far, that the various experiments which have been conducted along the lines of concentration have not been correlated. Each person has worked along his own lines without any reference to anybody else, although the character of the ore to be treated varies but little. This was carried so far in that unlucky and costly experiment of the Gooderham properties at Trail that barbed wire fence was erected at considerable expense all round the plant to keep people out. The treatment failed for exactly the same reasons as the old Silica reduction works had failed years before, also dealing with Centre Star ore on a modification of the cyanide process. Curiously enough the engineer in charge of the old Silica works, Mr. Gerald Hopkins, and who, therefore, knew of their short comings, was the engineer in charge of the Gooderham plant. But the American manager, Mr. E. B. Kirby, dismissed him. Then the \$300,000 plant was erected in direct opposition to Mr. Hopkins' advice. It failed. There was the Elmore process tried upon the Le Roi No. 2 and afterwards upon the White Bear. With regard to the first property it was discovered that the mine had more smelting ore than was at first estimated and on the other hand had hardly any concentrating ore of a \$7 or \$8 grade. The White Bear also proved deficient in concentrating ore. The Velvet-Portland started up an efficient concentrator on a small scale which proved successful but the mine has since closed. The successful part of the Velvet concentrator was the hydraulic classification of the pulp and its treatment on differently set concentrating tables, thereby avoiding much fine and expensive crushing. The Le Roi concentrator seems to have been inexpertly set up and the idiotic mistake was made of placing it on a level site when a sloping site nearer the mine was available and which site would have permitted the use of an aerial tramway already in existence. Consequently the ore had to be trammed to the concentrator and had to be handled more than once when inside as there was naturally no gravity system. This is practically the history of concentration in Rossland up to date and as ore can be treated at \$3 the grade of smelting ore has been reduced and the amount of concentrating ore thereby diminished. Hence concentration is retiring once more into the back ground. But as the ore veins of the camp are not defined by regular walls merely diminishing in value the wider they get there is always ore outside of the walls of the stope which is untouched until the next experiment in concentrating or the next reduction in smelting rates. This means, of course, that a mine developed down to its 1,000 foot level, has above that level much ore, perhaps in some cases, as much as has already been taken out, which is easily accessible when the reduction comes in smelting of concentration. Hence the cheap rate at which the Trail smelter is reducing Rossland ore is a distinct boon to that camp and should lead to much more development than is at present the case.

As Rossland is a camp of big mines so Slocan is a camp of small ones. The leasing system is working well so far and it is freely predicted that the success which has so far befallen the pioneers at this system will induce many hundred miners with small capital to attack other properties in that camp. The good price which lead is now at is further stimulating the industry. Moreover at Kaslo a separator has been erected by Mr. J. Alexander which is reported to be highly successful. The ore at present being treated is that of the Ruth and some 50 per cent.

of zinc is being made in the concentrates which have such iron values (the magnetic system is that employed) as to form a valuable flux for the smelters. So far is this the case that it is asserted that the excess iron units are sufficient to pay the cost of treatment. The separator is as yet only in its infancy and its working is being anxiously watched by the zinc men of the Slocan and of Ainsworth. Nothing further is heard of the zinc plant at Frank but it is thought locally that it will, with the Kaslo separator, help the market of the zinc ores.

The Hall Mines smelter is preparing for the introduction of a process of lime roasting which will reduce the cost of smelting. As the lime process is patented under several patents and as the patentees are at war with one another in the courts, the exact process which will be adopted is not as yet decided upon by the management.

The Trail smelter has now four copper and one lead furnace in blast and a second lead furnace is likely to be blown in during the month of December. The lead refinery is producing about 50 tons of lead daily and arrangements are being perfected at this smelter for the better marketing of its products, especially lead and silver, in the Far East. If the attempt is successful there will be an added market which cannot help being an advantage to the mining industry.

### THE MINES OF WINDY ARM.

Mr. W. Fleet Robertson, the Provincial Metallurgist of British Columbia, recently visited, in his official capacity, the Windy Arm district, in the Atlin mining division, which has lately attracted so much attention.

Windy Arm is a branch of Tagish Lake, the claims being situated near the boundary line between British Columbia and the Yukon territory. It is believed that transportation facilities will ere long be afforded the mines of the district by the extension of the White Pass & Yukon Railway, from Carcross to Conrod City.

The first discoveries of mineral in this locality were made on the Windy Arm slope of a mountainous ridge about 2 or 3 miles north of the 60th parallel. Developments at this point proved eminently satisfactory, and have resulted in stimulating prospective endeavour throughout the region, and during the past summer and autumn a number of claims have been recorded along the range, and on a parallel range lying to the east of Windy Arm.

From the shores of Windy Arm the hills rise rapidly, their lower levels being so covered with wash and slide as to have confined all prospecting to the upper levels—that is from 1,500 to 4,000 feet above lake level. Timber line in this part of the country is found to be at an altitude of from 4,500 to 5,000 feet above sea level, or about 2,000 feet above the lake.

The property at which development work has been carried on to the most considerable extent is that known by the Conrad Consolidated Mines which holds a group of 8 or 10 claims situated at an elevation of from 3,000 to 4,000 feet above the lake, in a comparatively level basin among the high peaks, some 4 miles in a direct line back from the Arm.

The report states that the surface share is covered with heavy wash or slide, in which rich float was found in such a well-defined line as to induce pits and cross-trenches to be dug until the vein was eventually struck in the solid formation upon the Montana, one of the central claims of the group. On this lead a drift had been driven for from 200 to 300 feet, attaining a depth estimated at about 100 feet. From this level stoping had been carried up in places for about 30 feet.

As seen in these workings, the vein was found to be a clearly defined quartz fissure vein between two distinct walls. The hanging wall is the general country rock of the vicinity—a fine-grained, basic, volcanic rock, too much altered to admit of closer determination—while the foot-wall is very much decomposed, rusty, coarsely crystalline, igneous rock, probably a diabase. The vein, as exposed, had a thickness of from 2 to 5 feet, averaging about 3 feet. The strike of the vein was found to be N.W. and S.E., with a dip to the S.W., into the hill, averaging about 25 degrees. On the foot-wall was found a layer from 3 to 12 inches thick of galena embedded in "carbonates," or iron oxides, from which astonishing high assays have been reported, not infrequently running as high as 800 ounces in silver, with \$20 in gold, to the ton.

Above this is the quartz proper, from 12 to 30 inches thick mineralized sometimes more and sometimes less, with iron pyrites and silver and antimony sulphides, from which the management report assays higher in gold but lower in silver, the whole, however, averaging well. The manager estimated the entire vein to run over \$25 to the ton which estimate seemed reasonable. Shipments of sorted ore were being made down the hill by the pack train which brought up supplies, and these shipments were reported as running over \$100 to the ton in gold and silver.



The provincial mineralogist took samples from the upper and lower portions of the vein, representing the two classes of ore rather than the average. These he brought to Victoria, where they were assayed by the government assayer. The results obtained were as follows:

No. 1.—Galena from the lower portions of the vein—Gold, \$13.60; silver, 442 ounces to the ton.

No. 2.—The vein quartz well mineralized—Gold, \$7.60; silver, 113 ounces to the ton.

No. 3.—The "fines" broken in sorting the ore from both portions of vein—Gold, \$17.60; silver, 163 ounces to the ton.

On the strike of the vein as indicated by the Montana workings, a tunnel was driven in on the Mountain Hero, the adjoining claim, through wash for 80 feet, when the solid formation was struck, in which a 50-foot raise was made, when the vein was found containing similar quartz ore, seemingly proving the vein and ore body for 1,800 feet along its strike. The management reports the vein as distinctly traced through at least seven claims by float and occasional croppings, upon which some work has been done.

The company has a Riblet aerial tramway 3½ miles long, almost completed from the Montana group to the shore of Windy Arm at Conrad City, and has constructed at the mine a stone bunk and cook-house for the workmen, and will, consequently, be able to continue development work all winter with a small force of men.

An Allied Syndicate, the J. H. Conrad Bonanza, has done much development in the way of open cuts on the Venus vein, which lies about half a mile south of the Montana.

The country here is cut by the deep canyon of Pooley creek, apparently a fault line, which has enabled the vein to be prospected at a depth of over 1,000 feet. The strike of this vein appears to be about south-west, with a dip to the west. In the same vicinity the syndicate is also developing a parallel vein on the Uranus claims, on which it is reported some 600 feet of work has been done, developing good ore.

From both of these properties tram lines have been surveyed and the right of way cleared down to Windy Arm, at a point some 2½ miles to the south of Conrad City.

There are probably 100 more claims located on this slope, on which, as yet, only slight surface development has been done, but in many instances most encouraging results are reported.

From the plans seen of the various properties, it would appear that there at least two main series of veins, an east and west series and a north and south series, which latter series, to the north of Pooley Canyon, bears to the northwest, and south of the canyon to the southwest. It could not be learned that as yet any development had been done on any claim on the west side of Windy Arm south of the 60th parallel. On the east side of the Arm, on Conrad mountain, which is cut by the 60th parallel, a large number of claims were staked late this past summer, but these have not yet received much development, being difficult of access and at an elevation high above the lake.

These locations, however, indicate that the mineralized belt will be found to pass into British Columbia, and that on such extension there is a promising field for the prospector.

The shore of the Arm was followed down to its southern end and the ridge to the west was found to continue unbroken, save where cut into by a couple of creeks.

The geological conditions existing in the vicinity of the Montana claim, appeared to continue to the southward into British Columbia territory and past the southern end of the Arm. The only exception to this was that within half a mile of the south end of the Arm, a bed of hard, dark slate cropped out on the west shore, its contact with the overlying igneous rocks being masked by the surface soil.

A prospector reported that this same slate is cut at an elevation of several hundred feet above the lake by Boundary creek, a creek that flows into the Arm from the west almost exactly on the 60th parallel. This contact, when traced out, should prove a profitable field for prospecting and is worthy of serious investigation.

On the east side of the Arm the mountains are even more precipitous than on the west, and seem to consist for the most part of the same class of igneous rocks seen on the west side of the Arm.

In the vicinity of the British Columbia boundary, about a mile to the east of Windy Arm, a mass of limestone was noted on the mountain side, and from float seen near by, it is probable that a band of slate will also be found on this side of the Arm, although its location has not been fixed. The contact of these sedimentaries with the igneous rocks, so prominent in the district, must be looked upon as likely to contain mineral, and is a section well worthy the attention of the prospector.

**Tyce Copper Company.**—During the month of October the Tyce smelter ran sixteen days, in which period 2,975 tons of Tyce ore were treated, giving a return, after deduction of freight and refining charges, of \$51,237.

## ONTARIO MINERS' MEETINGS.

At an adjourned meeting of mining men at Kenora, early in November, the following resolutions were passed.—"That this meeting recommend that the Government vote an amount of money as an appropriation for the purpose of demonstrating the continuity of the veins in this district to a depth of 1,000 and 1,500 feet, and in the event of the work being done on an existing property that owners of such property to guarantee one half the cost before the work is commenced."

"That this meeting recommend that in cases where lessees of mining properties have done development work and expended money in improvements thereon to an amount more than sufficient to cover the cost of acquiring title in fee simple to the properties in question, special consideration should be given, and unless in cases where evident abandonment has taken place, a patent should be granted in respect of such properties."

At the Sault Ste. Marie meeting, to which we made brief reference last month, the following excellent suggestions were made:—

1. That all lands belonging to the Crown whether surveyed or unsurveyed and whether valuable for pine or not should at all times be open for exploration and sale, and that no lands should at any time or under any circumstances be withdrawn from exploration or sale by Order-in-Council or otherwise.

2. That all applications for mining lands in each of the districts of Rainy River, Thunder Bay, Algoma and Nipissing should be made exclusively at one or more local offices in such district, and no applications for such lands should be received or dealt with at the Crown Lands Department in Toronto except through such local offices, and that such local officers should have powers similar to that of inspectors of mining division.

3. That every applicant should be required to stake out his mining location whether for surveyed or unsurveyed territory in the same manner as required by the regulations for mining divisions, and cause his application to be filed with the local agent within thirty days after his discovery, and immediately receive a location certificate from such local agent entitling such applicant to exclusive possession of such mining location during the validity of his title thereto.

4. That such application should be required to expend at least fifty cents per acre whether for surveyed or unsurveyed territory during ninety days immediately succeeding such discovery excluding from such computation the months of November, December, January, February, March and April, and also a similar amount during the next succeeding four years or prior thereto, but such expenditure shall be computed at the rate of \$3 per day for each day's work performed by a grown man, and that an affidavit proving such expenditure be filed with the local agent in the district in which such location is situate within thirty days after the time allowed for the performance of each such expenditure.

5. That an applicant complying with such provisions and filing an affidavit verifying such compliance should have twelve months from the time of such discovery to pay the first year's rental.

6. That the applicant upon paying his full purchase money and filing evidence of full performance of the development work should be entitled to a patent for such mining location but not before the performance of such development work.

7. That the size of mining locations shall not be less than forty acres, nor more than one hundred and sixty acres.

8. That the principles set forth in sub-sections c, d, e, f, g, h, i and j of the resolutions with regard to regulations for mining divisions hereto annexed be applied in amending this Act as far as may be.

9. That all specific royalties on ores and minerals should be abolished.

That in the opinion of this meeting the inspection of discoveries as provided by Orders-in-Council of 8th July and 18th August, 1905, is impracticable and very unsatisfactory, and should immediately be abolished, and that such inspection has done very great injury to mining in this province.

That in the opinion of this meeting one of the worst defects of the present Regulations for mining and of the Mines Act is that there is uncertainty of title to and possession of locations staked out and developed thereunder, and the above resolutions are largely designed to correct this defect in the Regulations for Mining Divisions and the Mines Act.

That in the opinion of this meeting the uncertainties created by the royalties on ores and minerals under the Mining Act being subject to the imposed or remitted by Order-in-Council has been most injurious to mining.

That in the opinion of this meeting the fact that nine-tenths of New Ontario is not opened for prospecting has been greatly retarded development of the mineral resources of this province, and that such mineral resources will never be developed until all government lands in the province are thrown open for prospecting.

That in the opinion of this meeting the province of Ontario should erect a smelter and refinery capable of smelting, treating and refining the silver Cobalt ores, and should make provisions for the experimental treating and refining of the iron, copper and nickel ores of the province.

Our special correspondent writes:—

The mutiny of those interested in mining, for the Toronto district, to discuss changes in the mining law, and appoint delegates to the general meeting on December 12th, which was called for November 27th, was very largely attended. Mr. W. D. McPherson occupied the chair and Mr. S. Dillon-Mills was appointed secretary. There was very full discussion on the various points brought up, but the views of the majority were finally embodied in the following resolutions:—

"That a mining law applicable to the whole of the province of Ontario should be passed by the Legislature."

"That it would be injudicious to provide for payments of any royalty or for a special tax applicable to the mining industry."

"That any license issued shall entitle the holder thereto to stake and hold mining locations in all parts of this province."

"That all Crown lands, whether valuable for timber or otherwise, should be open for prospecting."

"That the Ontario Government be requested to offer a prize for the demonstration of a satisfactory method of treating refractory ores of Ontario, for which a satisfactory method is not at present known."

"That in the opinion of this meeting no bounty should be paid on iron or steel made from ores imported from outside the British Empire."

"That contests arising regarding the location and ownership of mining claims should be decided by a mining commissioner sitting judicially at various mining centres, and whose decisions should be subject to appeal to the appellate courts of the province in the same way as judgments of the county courts are now applicable."

"That a committee of seven or more be appointed to receive the resolutions passed at this meeting and appear at the general meeting on December 12 to forward the same."

The following were appointed delegates to the general meeting to be held at Toronto on December 12th:—

Messrs. W. D. McPherson, Dr. W. T. Stuart, John Shilton, J. M. Clark, K.C., W. G. Trethewey, S. Dillon-Mills, J. W. Cheeseworth, H. Dreany, R. K. Sproule, L. A. Morrison, W. D. Gregory, W. H. Walbridge, Fred Fenton, T. D. Ledyard, Dr. J. E. Elliott, R. W. Leonard, Thos. A. Drew, T. R. Dewar, C. B. Jackes, Prof. W. G. Miller, T. W. Gibson, Dr. A. E. Barlow, C. C. Farr, J. A. Proctor, Geo. A. Kingston, Dr. J. McMaster, C. J. Agar, W. L. Hime, W. M. Marsh, John Webber, Prof. Latimer, and G. M. Mickle.

At the Sudbury meeting, held on November 1st, it was resolved that the Mines Act should be amended in the following respects:—

1. That all Crown lands, whether valuable for timber or otherwise, should be open for prospecting.

2. That all territory valuable for mineral should be formed into divisions, to be called Mining Divisions, with a recording office in each division, and that all applications for mineral should be made to the recording office of the Division in which the mineral is found.

3. That each recording office should have on file all applications and records for its division, and also maps showing all locations, which should be open for inspection by prospectors.

4. For the purpose of an affidavit of discovery, vein matter or rock, in place, indicating presence of mineral should be considered a discovery of mineral.

5. That the size of the mining location should be 40 acres for precious minerals, and 160 acres for the base minerals, but an applicant may apply for a smaller location of not less than 20 acres.

6. Where a lake occurs in a mining location, the limits of the location should extend to the high water mark, subject to the usual regulations respecting road allowances, fishermen's rights, etc.

7. That all applications should be filed within fifteen days after the date of discovery, providing that one day extra be allowed for every five miles beyond the first ten miles in distance from the proper recording office.

8. That after the expiration of 15 days or longer, as the case may be, from the date of filing of the application, a certificate of Record should be issued from the office where the application is filed.

9. That a mining location should be marked or staked out by planting a discovery post of wood or iron (on which is written or stamped the name of the discoverer, the number of his license, and date of discovery) upon an out-cropping or show of mineral or rock, in place, within the boundaries of the location and by planting at each of the four corners a post of wood or iron in the order following, namely:—No. 1, at the north east corner; No. 2, at the south east corner; No. 3, at the south west corner; and

No. 4 at the north west corner; the number in each case to be on the side of the post towards the post which follows it in the order in which they are named.

(2) In surveyed territory the location should consist of a fractional part of a lot as mentioned in sub-section two of section 18, of the Regulations for Mining Divisions governing the Temiskaming Mining Division.

(3) That where there are standing trees upon a location so staked out, a blazed boundary line should be run (by blazing into the wood on two opposite sides of the trees in the direction of the line) so as to be distinctly seen, and the underbrush should be cut along the line; and a blazed line should be run from the north east post to the discovery post.

10. That the north east angle of the location as fixed by the prospector should be the point from which all surveys should be made, and that priority of claim should be observed in fixing the limits of the locations in the locality.

11. That \$100 per year should be expended on each location for a period of four years in actual mining work to be computed at the rate of \$3.00 per man per day, provided that the total amount of work may be performed in a less period at the option of the applicant; all such work to be performed before a patent can be obtained.

12. That affidavits showing quantities of work performed should be filed within thirty days after such work has been done.

13. That section 36 should be cancelled so as to leave the working conditions regarding iron ore the same as in regard to all other ores.

14. That the price of mineral lands should be uniform all over the province; at the rate of \$2.50 per acre in surveyed territory, and \$2.00 per acre in unsurveyed territory.

15. That the school tax of one cent per acre on patented lands in unorganized territory in Algoma should be abolished.

16. (1)—That the uniform price of two dollars and no more should be charged for Mining Licenses.

(2)—That no application for lands be recorded except in the name of the licensee.

(3)—That discovery must be made subsequent to the date of the applicant's license.

(4)—That a fee of \$5.00 be charged for the recording of each claim at time of application.

17. That rule 23 of the regulations for Mining Divisions should be amended so that the fees of \$10.00 and \$6.00 respectively, for recording additional claims should be \$5.00 and \$3.00 respectively, and that the fee for recording assignments of locations should be \$10.00 instead of \$5.00.

18. That there should be a right of appeal to a proper Court of Law, from all the decisions of agents or inspectors.

19. That all affidavits required under this Act, may be sworn to before any Justice of the Peace, Notary Public, Commissioner for taking affidavits in the High Court, and any agent appointed under this Act or any Crown Lands Agent.

That a special Court should be created for the hearing of mining disputes, and appeals from decisions of inspectors, and that provision should be made for having mining cases decided quickly and at a minimum cost.

That the making of radical alterations in the mining laws by means of Orders-in-Council is strongly condemned.

That the imposition of royalties would be injurious to the mining industry and cannot be too strongly condemned.

That the Government should investigate the smelting and refining industry with a view to ascertaining whether the silver cobalt ores and nickel copper ores can be profitably refined in this Province.

That in view of the increasing importance of the mining industry, it is desirable that a commission should be appointed to investigate the condition of the industry and collect information concerning the mineral resources of the Province and measures for their development.

That the present mining law has, in general, proved satisfactory, and with the amendments above suggested, should be found a liberal protection to the prospector and the mine owner.

The following delegates were appointed to attend the Mining Congress to be held in Toronto: Mayor O'Connor, and Messrs. J. F. Black, G. A. Loney, A. P. Turner, President of Canadian Copper Company, W. W. Stull, J. K. MacLennan, and Major J. R. Gordon, and such others as the Chairman should designate.

## COBALT.

The Dominion Government's Trade Agent at Manchester writes:—The reports from Canada concerning cobalt mining has caused inquiries to be made here regarding it. A chemical company wishes to obtain an approximate analysis of the ore, quantities, price per gross ton and terms. They are of opinion that large quantities could be placed in Great Britain in the crude state. If their view is correct (freight rates not being prohibitive), the excessive charges for smelting will be averted, and better profits will result to the shippers.

## HALL MINING &amp; SMELTING COMPANY.

We publish elsewhere in the issue a review of the report recently issued by this company at its annual meeting, held in London on October 30th, but to this may be added the report of Mr. R. R. Hedley, the smelter manager, which contains several matters of interest. Mr. Hedley reports as follows:—

No. 1 blast furnace has been in operation 264 days and No. 2 furnace 290 days, which figuring their respective capacities means 76 per cent. of the time, which agrees very closely with 1904. We have smelted 5,138 tons of dry ores, 8,210 tons of lead ores not roasted, and 8,281 tons of roasting ores, including a large quantity of lead concentrates. In addition to this, the fluxing ores, Emma and Standard, have been 12,475 tons. The bullion shipped amounted to 7,603 tons. We also shipped 252 tons of concentrated copper-lead matte, the total content of these two items being 1,206,920 ounces silver, 9,021 ounces gold, 40 tons copper and 7,436 tons lead, with a total valuation of about \$1,100,000.

From a technical point of view the work of the past year has been highly satisfactory and has given excellent metallurgical results and our metal recovery has been abnormally high. This is due to a constant watchfulness and attention to minute detail of metallurgical practice. Considering that, with the low tonnage available, the low treatment rates did not cover operating expenses, this should be a matter of congratulation.

The ore supply has, as usual, been very capricious. At times the stocks have been large and of suitable character. At other times we have been obliged to shut down one of our furnaces for lack of ore. The situation has improved since the beginning of the year, and I trust will continue to the end.

The expenditure on maintenance and construction has been heavy, amounting to \$27,000 for maintenance and \$16,000 for construction and plant. The heaviest items of maintenance have been \$8,378 for the blast furnaces, \$6,048 for roasters and briquetters, and \$7,202 for general maintenance. In new plant and improvements, the heavy items are \$7,664 for the Merton furnace and \$3,560 for bag house and extension of flues and ventilation. Commenting on this, I may say that much work has been done with a view to the permanent improvement of the plant. The sample mill being inadequate, was increased in size and the unloading platform lengthened, facilitating the handling of a greater number of cars at a time. Much, however, remains to be done in this department to bring it to the standard of efficiency of the remainder of the works. The advantage of this work will be seen in the reduced cost of handling and sampling. New and substantial gravity bins were provided in connection with the new track system for holding concentrates and roasting ores, which were necessitated by the increased roasting facilities afforded. The new elevator, completed this year, in connection with the roasters and lower yard, handles very efficiently the product of the three hand roasters and the Merton, at a very small cost, to an automatic trolley at a high level above the upper yard, affording thereby a greater storage than before. This will also be used to convey foul slags and similar material to receiving bins. The feed floor has been completely renewed, the old floors having become unsafe. At the furnace level much was done towards improving conditions by laying a cast iron flooring about the furnaces and improving the facilities for the handling of matte, etc. Tuyeres of a new design have been provided to replace the obsolete ones on the small blast furnace, which were leaky and unsafe. Additional jackets for No. 2 furnace were also installed, that furnace being water jacketed from top to bottom and independent of the brick work above the tuyeres, gaining the advantage of being able to clean out the shaft with less labor and in a fraction of the time before necessary.

The most important improvement about the furnaces, however, has been the separator designed by Mr. Harris, which does away with the large and cumbersome settlers, with all the expenses entailed in handling, and gives us a very much better separation and, therefore, generally cleaner slags. The principle of the settler is that the separation of the matte from the slag takes place within the furnace, at the greatest heat, and maintains it in passing from the furnace to the separator, which occupies but little space, and which permits the matte to flow under a water jacketed partition, filling a small compartment with a constant overflow, while the slag is forced to flow from the original compartment. These settlers it will be perceived obviate the customary remixing of matte and slag as they drop into the large settler, and we find that an ordinary cast iron box with about 10 cubic feet capacity, instead of about 50 cubic feet as before, quite sufficient for settling purposes, from which the slag flows to a granulating flume. These small settlers are easily handled by a shain block and travelling trolley.

Natural means of effecting ventilation failing, and finding it impossible to expect good work from men working daily in a vitiated atmosphere, it was decided to introduce a system of mechanical suction. Hoods and pipes were provided in connection with a large suction fan, and the fumes therefrom forced

into a small bag house, where the valuable constituents could be saved. This had not long been completed but may already be considered a success.

Considerable expense was incurred in strengthening our large mechanical roaster; a section of the lofer arch was replaced by new work of more substantial design and build, with the result that the furnace has now been doing good work for the past seven months almost continuously. We may confidently expect that the brick work of this roaster will give us no further trouble, especially as regards the new section. The capacity of the roasting plant was further increased by the addition of our Merton furnace. Several changes in the detail of construction of this machine have been necessary to meet our conditions, but the expectation, based on the satisfactory operation during a short period, is that the furnace will materially decrease our roasting costs. It was found necessary to increase the size and length of our flues which connect the roaster with the main flues.

My last report mentioned the construction of a new hand roasting furnace of our own design. This furnace has been eminently satisfactory, being more economical in both fuel and labor for a similar result of efficiency.

The equipment of the machine shop has been improved by the addition of more machinery. The operation of this department saves much money in the maintenance of our machinery in general.

We have been very carefully investigating the merits of improved processes for smelting lead ores, and have acquired a very great deal of extremely interesting information on the subject, and trust that during the current year we may be enabled to instal a plant that will adopt one of these several improved processes to the advantage of smelting operations.

I must express myself as very well satisfied indeed with the services rendered by the heads of departments, especially by Mr. Harris, who has been untiring in his zeal and devotion to the company's interests. Yours faithfully,

(Signed) ROBERT R. HEDLEY,

Smelting Manager.

## MINE ACCOUNT.

	£	s.	d.
To expenditure (prior to partnership with M. S. Davys)—including safeguarding of property, insurance, taxes, etc. . . . .	106	17	9
To depreciation of Stocks (principally mine timbers) . . . . .	632	14	9
To Balance, being profit. . . . .	159	8	6
	£899	1	0
By Royalty (prior to partnership with M. S. Davys) or ore output by tributers. . . . .	360	8	1
By sundry receipts, including interest . . . . .	538	12	11
	£899	1	0

## SMELTER ACCOUNT.

	£	s.	d.
To purchase of customs ore . . . . .	170,525	6	5
To Freight, expenses and interest . . . . .	13,626	16	8
To Administration expenses. . . . .	2,909	6	7
To Smelting expenses. . . . .	42,003	3	4
To outside expenses. . . . .	1,762	5	7
To maintenance of buildings, plant and machinery. . . . .	5,603	13	2
To Balance, being profit. . . . .	5,094	14	0
	£241,525	5	9
	£	s.	d.
By value of Bullion, etc., produced . . . . .	241,996	0	1
Deduct expenses on same . . . . .	470	14	4
	£241,525	5	9

## GENERAL ACCOUNT.

	£	s.	d.
To general expenses of the Company—in B. C. and London. . . . .	1,812	14	0
To debenture interest. . . . .	1,473	12	0
To Exchange. . . . .	14	19	3
To Balance, being profit. . . . .	6,023	1	2
	£9,324	6	5
	£	s.	d.
By profit on Mine Account . . . . .	159	8	6
By profit on Smelter Account . . . . .	5,094	14	0
By profit on working Emma Group of Mines. . . . .	2,849	15	10
By sundry receipts in London and B. C., and profit on sundry transactions . . . . .	1,220	8	1
	£9,324	6	5



## ONTARIO MINING INTELLIGENCE.

(FROM OUR OWN CORRESPONDENT.)

The following mining lease has been cancelled by the Minister of Lands and Works for Ontario for non-payment of rental:—Lease granted 31st Oct, 1900 to T. C. and L. Carlton and by them transferred to the Flint Lake Gold Mining Co., Limited, as to McA 285, 138 acres, and to the Westerfield Mining and Investment Co., Limited, as to McA 286, 140 acres, both in the District of Rainy River.

A graphite property near Denbigh, Ont., owned by J. G. Allan, of Hamilton, is to be taken over and operated by the Allanhurst Co.

Some specimens of native copper which appears to be very rich are on exhibition at the office of the C. P. R., Toronto. They come from a deposit near the Soo branch of the C. P. R. The vein is said to be 2 miles long and from 4 to 21 feet wide.

A one-tenth interest in a group of iron properties in the Hutton iron range (Moose Mountains) has been sold to Mr. Gates, of Chicago, a director of the United States Steel Co., for \$250,000 in cash. Arrangements are meanwhile being made to work the property on an extensive scale, and it is expected will result in a large increase in freight for the C.P.R. and business for the James Bay road, which will extend its Toronto line to Hutton.

The shipments of grain corundum of the Canadian Corundum Co. for the month of November amounted in the aggregate to about 400 tons.

The statement which has appeared in many of the papers that the Hart Corundum Wheel Co. and the Canadian Corundum Wheel Co. have amalgamated is incorrect. There have been some negotiations, but nothing has come of them.

Messrs. Mackenzie & Mann have purchased from Mr. Spry, of Chicago, and Chas. Osborne, of the Michigan Soo, a minority interest in Moose Mountain iron deposits for a price which makes the whole value of the property \$2,500,000. They are now negotiating for another small interest.

Canadian Mines, Limited, a company with headquarters in Toronto, is working on a new process for separating molybdenite from the rock, and when the machinery is perfected they purpose working deposits which they hold in various parts of Ontario. They also hold very promising deposits of mica in Loughboro township, close to the mine of the General Electric Co. of New York, and on the Gatineau. There is such a good demand for mica that they consider the latter better than a gold mine.

Messrs. Mackenzie & Mann are about to let a contract for an extension of the James Bay Railway to the north nickel range. Docks are also to be built at the mouth of the French River at which coal will be discharged.

Further discoveries are reported of silver and cobalt beyond Tomstown on the Blanche River, about 80 miles north-east of Cobalt. The veins are said to be wider than those found at Cobalt.

The Fairbank Co. is arranging to resume operations on their gold properties in the township of Dunistown.

The Trotter property near Webbwood, Ont., is again on the market, Mr. A. D. Bailey, who was sent out from England by the Tarsus Sulphur and Copper Co. and who did some development work on it, having withdrawn. Mr. Bailey sunk a shaft 45 feet, and a couple of pits. The rock is copper pyrites and shows as high as 6½ per cent of copper, but it does not seem to have satisfied the Tarsus Co., which engage only in large undertakings. There are a number of copper properties in that part of Ontario which are too small to be worked singly, but if grouped and joined by rail or tramway could be worked economically and made to pay.

Further deposits of felspar in paying quantities, are reported to have been found on the north shore of the Rideau. Felspar is being mined in the county of Frontenac, and it is probable these deposits, if they exist, are part of the same formation.

No report of the oil well gusher which newspaper report says has been struck in Manitoulin Island has reached the Ontario Department of Mines. That there is oil to be found on Manitoulin does not admit of doubt, but the field is too shallow to warrant the hope that it exists in such quantities as indicated by the alleged strike.

Everything points to great activity in mining for next year, and the Ontario Bureau of Mines anticipates development in Northern Ontario far beyond anything hitherto experienced. It is to be hoped a damper will not be put on the industry by wildcat schemes which are so apt to be brought forward at such a time.

Mr. H. L. Kerr, who was sent out on an exploratory tour of the Metagami district, has handed in his report. The region is largely agricultural land with not many exposures of rock. Where they do occur they are largely Huronian. Mr. Kerr found traces of galena and iron. The marshes contain excellent peat.

Sir Richard Cartwright has, in the Divisional Court, again won his suit with the Bullion Mining Co. Sir Richard had given two promissory notes of \$3,000 each to cover shares in Bullion Co. (No. 2), which was in process of formation and was to take over the assets of Bullion Co. (No. 1). One of these notes had been paid and the company sued for the other. As the deal between the two companies had never gone through, and the shares were never delivered, the trial judge found in Sir Richard's favour, and ordered the return of the \$3,000 already paid. The company appealed to the Divisional Court, which has affirmed the judgment of the trial judge, Mr. Justice Britton.

There is a prospect of a revival of the phosphate industry in the near future. The Carolina deposits are almost exhausted and the price has now reached such a figure as to encourage the opening up again of the mines in Canada.

The difficulty of treating the low grade copper found ores at Massey, Ont., has been overcome. The Massey Station Copper Co. has been operating for three years and has spent about \$300,000 in experiments. By a modification of the Elmore process a concentrate of 20 per cent can be turned out from a 3 per cent ore.

Representatives of a United States syndicate, said to be worth \$60,000,000, have been in New Ontario investigating some silver properties about Cobalt on which they have secured options. They took with them a well-known expert. It is their intention to send out exploring parties in the spring to make search for further deposits.

At a meeting of the shareholders of the Payne Consolidated Mining Co., Limited, a lease of the property of the company for three years to Mr. Walker Smith was approved, the substance of which is that the company is to receive 15 per cent of the net smelter returns on any ore taken out of the mine, the lessee being limited to take such ore to a depth not exceeding 200 feet below No. 8 tunnel. The affairs of the company are not in a very satisfactory condition and a circular has been sent out to the shareholders explaining the position and offering them the opportunity of subscribing for bonds, by which means their interests would be placed in a better position. It is probable the mortgage on the property will be foreclosed.

New York capitalists are arranging to spend at least \$12,000 in development at the Harmony Copper Mine north of Sault Ste. Marie.

The Hamilton Nickel Co. is negotiating with a United States company to resume operations. They propose to introduce the Orford process which they claim is not protected by patent in Canada.

Mr. Jas. Curry, a Toronto broker, is trying to bring about a consolidation of all the mines at Cobalt. They would, if the amalgamation is carried out, erect a smelter and smelt their own ores.

The only competition the Canadian Corundum Co. has had in that industry has disappeared from the field. About six months ago the Ontario Corundum Co., operating in the township of Carlow, sold out to the Ashland Emery Co., a subsidiary company to the Ashland Co. of the United States. The latter brought over some machinery from one of their mills in the United States, but business troubles have arisen and the works have been closed. It seems likely that the property will revert to Mr. Thos. Armstrong, of Carlow, who sold it to the Ontario Corundum Co.

Among recently incorporated companies is the Windy Arm Syndicate which has interests in some 48 mineral claims lying in the Yukon district, at Windy Arm Lake near Carcross or Cariboo Railway station on the White Pass & Yukon Railway. The district in which the mines are situated is extremely rich in silver, gold and lead ores with small showings of copper. Development work is to be proceeded with at once. The company is composed of Toronto men, and Mr. Armour, one of those interested, is in Europe making financial arrangements. The property controlled by Mr. J. H. Conrad, at the same place, has been turned over to a joint stock company composed of the same persons.

What will probably be a test case as affecting the Cobalt mining camp came before the Minister of Lands and Mines for Ontario recently, in *Gaizer v. Thompson*, in which an application was made for a fiat to issue to set aside a lease on the ground that no discovery of valuable minerals had been made. The matter was argued by J. M. Clark, K.C., for the applicant, and E. F. B. Johnson, K.C., for the lessee, but no decision was given,

nor will there likely be till an authoritative interpretation has been laid down of the words "discovery of valuable ore or mineral" in the Mines Act. There are a number of such cases pending, and there is likely to be much litigation, both before the Minister and in the Courts over disputed claims at Cobalt. In cases where the inspectors have decided that there has been no discovery, the applicants have the right to appeal from the ruling of the inspectors within 20 days, and there are a number of such appeals in, most of which are standing for argument.

A very interesting paper on the manufacture of steel was given at the Toronto Engineers Club recently by Mr. Samuel Groves, editor of the *Canadian Engineer*, 1904, lecturer on mines, furnaces, and foundry to the Carnegie Technical Schools, Pittsburg, Penn., and late foundry engineer to the Westinghouse Machine Co., Pittsburg. Mr. Groves described the three methods of steel manufacture—the Bessemer, the open hearth furnace and the Tropenas system. The latter he pronounced the best. His deductions were made more intelligible by diagrams. Mr. Groves, who has given many years study to the manufacture of iron and steel, has great faith in the future success, of iron smelting by electricity, the experimental plant in connection with which, at Sault Ste. Marie, will be in operation in a few days. In this he agrees with Dr. P. I. T. Heroult, technical director of the French Electro-Metallurgical Society, which has immense works at La Praz, France, where aluminum and steel are produced. Dr. Heroult, who is one of the first authorities on electric smelting, says that in ten years Canada will have iron industries larger than any country in the world, and that they will be worth more to her than her wheat fields. Mr. Groves pins his faith to Dr. Heroult's opinion.

An examination of Jackfish gold mine by an English engineer has led to a recommendation that the mine should be equipped with a larger and more expensive machinery plant to carry on operations than was first contemplated. The equipment as proposed would, it is estimated cost in the neighborhood of \$125,000. The company is therefore endeavoring to raise additional funds for this purpose.

## NOVA SCOTIA MINING INTELLIGENCE.

Our special correspondent sends the following list of mining areas applied for during the month:—

DISTRICT.	AREAS.
Stormont.....	181
Big Liscomb Lake.....	6
Killag.....	55
Leipsigate.....	27
Lawrencetown.....	6
Fifteen Mile Stream.....	54
Lochaber.....	18
Gold River.....	7
Ragged Falls.....	91
East River Sheet Harbour.....	12
Millers Lake.....	34
Tangier.....	34
Voglers Cove.....	9
Broad River.....	12
East Rawdon.....	28
Brookfield.....	65
Somerset.....	6
Oldham.....	33
South Uniacke.....	8
Wagamatkook.....	20
West Gore.....	206
Salmon River.....	6
Montague.....	70

## MINING MEN AND AFFAIRS.

Mr. A. C. Galt, the well-known barrister of British Columbia, and legal adviser of the War Eagle and Centre Star companies, is leaving Rossland, where he has resided since 1896, in order to practice in Victoria, where he has opened offices in the Board of Trade Building.

Mr. J. H. Ellis has resigned the superintendentship of the Bannockburn Lead Mine Properties, Ontario, and is succeeded by Mr. G. W. Burnett of New York.

Mr. C. H. McMillan, formerly of Ensly, Pa., has joined the staff of the Dominion Iron & Steel Company as engineer in charge of the open hearth department.

Mr. W. R. Ingalls, in an interview with the *Nelson Daily News*, stated that the Zinc Commission proposes to return and continue the field work in British Columbia next spring. The work this year was confined almost entirely to the Slocan dis-

trict. The object of the commission, he pointed out, was not to include the appraisal of any mine, or to approve or condemn any special process or method of treatment, but that after the tests shall have been made at Denver this winter the Commission will no doubt be in a better position to suggest the most economical method, or methods, of treating British Columbia zinc ores. The report that the Commission was refused access to some of the mines is incorrect.

The *Victoria Colonist* announces that Mr. J. W. Haskins, manager of the Rosella Mining Company and proprietor of a number of claims in the Cassiar district, has received an offer from a Chicago investor to purchase "a half interest in the immense deposits of zinc and copper ore on Haskin's Mt.," for which he offers to pay the large sum of \$350,000.00. Mr. Haskins is a well-known British Columbian "mining optimist," and can spin a yarn with the best of them.

Mr. S. F. Parrish, formerly manager of the Le Roi mine, has been, it is reported, appointed manager of the Morning mine in the Coeur de L'A owned by the Federal Mining Company. It is also understood that Mr. Parrish is also acting as consulting engineer.

Mr. C. F. Webster, Mining Engineer for the Transcontinental Development Syndicate, has spent the summer in the Skeena and Telequa River districts, and reports that a promising semi-anthracite coal property, producing an excellent fuel for railway purposes, is being opened up by the company.

Mr. P. Kirkgaard has left Deloro, Ontario, and is now at Cobalt, in connection with the proposed erection of the reduction works there.

It is reported that a Mr. H. S. Ferguson, a hydraulic engineer of New York, is investigating the water powers in the vicinity of Waverley, B.C., on behalf of the company, and is negotiating with the former owners of that property for the purchase of the Waverley and the water rights. The Waverley, it will be remembered, was one of the Grant Govan promotions.

Mr. Robert Jaffray, Vice-president of the Crow's Nest Pass Coal Co., recently returned from a visit to British Columbia, where, with Mr. G. G. S. Lindsay, General Manager, and several of the directors, a week was spent at the mines. A number of improvements have recently been made, including a tippie and screening plant at Coal Creek and compressed air locomotives for hauling at Michel. Everything is working satisfactorily at the mines. The men are contented and earning good wages. Shipments are somewhat hampered for want of cars. A sale of 20,000 tons of coke for delivery at Salt Lake, Utah, was not filled because cars could not be secured. A large tonnage of coal has, however, been sold to railways in the United States, but long hauls and a duty of 67 cents a ton interfere with the export trade. Mr. Jaffray expresses himself strongly in favour of making coal free both in Canada and the United States. He has great faith in the future of British Columbia, especially her mining industries.

Mr. J. H. McKenzie, manager of the Le Roi Company, and Mr. W. H. Aldridge, of the Canadian Smelting Works, sailed on the s.s. "Baltic" from New York on Nov. 15th, to attend the meeting of the Le Roi Company, which, it was expected, would be held on the 30th of November, or early in December.

Mr. A. H. A. Robinson, who for the past three years has acted as surveyor with the Intercolonial Coal Mining Company, Westville, N.S., has resigned that position, and has joined the engineering staff of an important copper undertaking in Arizona.

Mr. J. W. Astley, formerly manager of the Le Roi mine, passed through Montreal early in December en route for England. Mr. Astley, we regret to say, is suffering from very poor health, and does not anticipate returning to Canada.

Before Mr. Astley left Rossland he was presented by the employees of the Le Roi Mine with a case of silver plate, and by the business men of Rossland with a fine set of silver fish knives and forks.

Mr. Robert Archibald, C.E., has been appointed manager of the recently incorporated Eastern Coal Company, operating at Maccan, N.S.

Mr. Arthur Clare has been appointed head amalgamator at the Second Relief mine, Erie, B.C. Mr. Clare was in charge of the Ymir mill for a period of 5 years, and recently was employed at the Eagle Plate mine at Hedley.

Mr. C. H. McMillan, formerly president of the open hearth plant at Ensly, Pa., recently joined the staff of the Dominion Iron & Steel Company, as an assistant to Mr. Jones, the general manager.

Mr. J. C. Foley, general manager of the Shakespeare Gold Mining Company of Webbwood, Ontario, died suddenly at the mine on Dec. 1st, from heart failure.

Mr. Robert Anderson, formerly superintendent of the B.C. Mine, Boundary District, and of the Le Roi, Rossland, returned to British Columbia after an absence of some months in Salt Lake City, Utah.

The death occurred in Ottawa last month of Mr. J. A. Gemmell, the well known barrister of that city, who was also identified with the early history of the Crow's Nest Pass Coal Company. Mr. Gemmell was very widely known, and his loss is keenly felt.

Mr. J. C. Mitchell has resigned the managership of the Inverness Collieries, and has joined the staff of Dominion No. 1. Prof. Lischmann, instructor of the mining classes at King's School, Glace Bay, has already organized the work there, which promises to be most successful. The Dalhousie classes at Sydney Mines have also been well attended, no less than 125 students having been enrolled during the last few weeks.

The American Institute of Mining Engineers announced a meeting to be held on Feb. 21st at Lehigh University. Papers offered for this meeting should be in the secretary's hands before Dec. 31st, 1905. A joint meeting with the Iron & Steel Institute is to be held in London on July 23rd, and will continue for about two weeks. In reference to the recent excursion to British Columbia, a descriptive narrative has been prepared by the secretary, and will be found in the November number of the bi-monthly bulletin now in press. This narrative comprises about 75 pages of reading matter, and is illustrated with more than 50 engravings. It will also be published in a limited separate edition, for which \$1.00 per copy will be charged.

The Geological Survey has sent the Duke of Argyle, a former Governor General of Canada, a sodilite stone base to be used in a monument to the Duke's father. The stone was procured in the Princess quarries in Dungannon, Hastings County, by Mr. Charles W. Willmott of the Geological Survey, who located rich deposits there in 1893. When the Duke was in Canada, he was much attracted by the richly colored blue stone, and the Princess took similar interest in the quarries then being worked. She allowed one of them to be named after her.

### MINING STATISTICS.

The output of the Crow's Nest collieries for the month of October was as follows: Coal Creek, 32,744 tons; Michel, 24,232.17 tons; Carbonado, 7,838.04 tons; total, 64,815.01.

The Dominion Iron & Steel Co's output for October was the largest in the history of the company. The output of the open hearth furnaces for the month was 18,915 gross tons of steel, and of the blooming mill 15,262 tons.

The returns of lead shipments to the Trail smelter during October show production to have been made by 20 lead-producing mines to the extent of 2,313,682 lbs., which yielded 944,852 lbs. of lead. To the Hall Mines smelter 2,676,705 lbs. of ore was shipped from 33 mines producing 672,949 lbs. of lead. The price during the month ranged from £14 2s. 6 d. to £15, and bounty was paid by the Dominion at the rate of from 20.68 to 39.69c. per 100 lbs.

Shipments from Nova Scotia collieries during the month of October were as follows:—

Dominion Coal Company	323,884 tons
Acadia Coal Company	26,994 "
Cumberland R'y & Coal Co.	41,904 "
International Coal Co.	20,805 "
Inverness R'y & Coal Co.	19,617 "
Nova Scotia Steel Co. (Sydney Mines)	50,369 "

Total shipments from the Boundary District for the year, to the end of November, aggregate 833,744 tons; from Rossland 303,183 tons.

Shipments from the Cumberland Railway & Coal Company, Springhill, N.S., for November, aggregated 40,473 tons.

### MINING NOTES.

#### QUEBEC.

The Chibogamoo Mining Company, which has acquired valuable mineral areas in the new Chibogamoo district, Northern Quebec, has increased its capital to \$6,000,000.00.

Another important concern has been added to the list of asbestos mining companies, namely, The Asbestos Mining and Manufacturing Co., composed chiefly of Providence (R.I.) investors, to carry on operations at Wolfstown in the Theford district, the centre of the asbestos industry. The capacity of the plant at the start will be 150 tons of ore a day, but it is the intention to increase this subsequently to 300 tons. The build-

ings are being erected at the present time, and the plant, which is being furnished throughout by the Jenckes Machine Co., Limited, of Sherbrooke, Que., comprises. One 30x15 and two 20x8 style "B" Farrel Bacon Ro-k Crushers, one set 36x17 Geared Crushing Rolls, two heavy-pattern Cyclone Pulverizers, one Conveying and Picking Table 32" belt 40' centres, one Steel Revolving Ore Dryer 48" diameter, 30' long, several Revolving Sizing Screens together with Bucket Elevators; all the transmission machinery required, also a pit plant consisting of Vertical Boilers, Derricks, Hoisting Engine, etc., and a very fine steam plant made up of a 14 and 26x36 Jenckes-Corliss Engine; two 150 H.P. 72" diameter x 18' long High Pressure Tubular Boilers, Condenser, Boiler Feed Pump and Feed Water Heater, all complete.

#### BRITISH COLUMBIA.

Rossland.—The Spitzee Gold Mines has been reconstructed by assessing shareholders 50 cents a share, payable in two instalments of 25 cents each on the 15th of December and on the 15th of March next. It is believed this will afford ample funds for the purpose of carrying on development work and providing an adequate plant.

The Rossland Miner, in a recent leading article, refers to the increased activity in the mining districts of Kootenay, and specially remarks on the improvements in the situation as regards ore production. At Trail a new copper furnace, of large size, is being installed to meet new requirements, while the Dominion Copper Company in the Boundary District has already commenced smelting operations. Reference is also made to the improvement at the Hall Mines Smelter of the Marysville works, and of the building of the new zinc smelter at Frank.

Slocan.—Mr. S. S. Fowler has secured from the London and B.C. Gold Fields a lease of the White Water mine, and last month shipped about 60 tons of concentrates, averaging about 80 oz. of silver and 40% lead. Development work is to be continued during the winter.

Boundary.—Mr. A. B. W. Hodges, Superintendent of the Granby Company, has agreed, subject to the confirmation of his directors, to reduce the working day at the Grand Forks smelter to eight hours, and employ three instead of two shifts, the men on the other hand agreeing to a reduction of wages equivalent to 10%, with the exception of labourers receiving \$2.50 per day. This change will involve a large increase in the staff at the smelter, by the employment of 50 additional men, and make a difference of \$40,000.00 in the monthly pay-roll of the works.

Cariboo.—The *Inland Sentinel* publishes a short résumé of the season's work in this district, and reports that properties on China Creek had a successful run, while the Bear Company on Cunningham Creek is spoken of as likely to become one of the largest hydraulic mines in the district. During the season from 30 to 40 men were employed constructing a dip to carry water from Cunningham and Antler creeks to the property, and next spring a dam is to be built in Cunningham Pass to provide a reservoir. On the Slocan-Cariboo Gold Mining Company's property a shaft house was built last season, and a stamp plant installed, while a shaft was sunk to a depth of 60 feet. It is proposed to continue this shaft to a depth of 90 feet and then drive a distance of 200 feet to strike the channel of Canadian Creek. At Slough Creek pumping is being continued regularly at the rate of about 800 gallons per minute. On Peter's Creek a large water well installation has been made, and underground working is about to commence. Operations are also proceeding at Laird's property on Willow Creek, where a sinking is being continued, while operations are also active at Wingdam. The Cariboo Consolidated, Ltd., are continuing the bed rock drive, and it is hoped that richer ground will be encountered higher up the creek.

Coast.—The Copper Queen mine on Texada Island, which was recently reopened by Eastern investors, is now being systematically worked with a force of 40 miners. It is said that a promising new showing of ore has been opened up.

Rossland.—The suit of the Centre Star Mining Company vs. The Rossland-Kootenay Mining Company, known as the *Nickel Plate* case, has been amicably arranged.

Boundary.—Litigation in connection with the Providence mine, near Greenwood, continues to occupy the attention of the Courts, and two cases, in which judgments were given adverse to local shareholders, were recently appealed, and the decisions reversed.

At a recent meeting of the directors of the McKinley Mines, Limited, a resolution was passed granting an option on the property to Mr. J. S. C. Fraser, of Rossland, for \$200,000.00.

Slocan.—Chief Justice Hunter has given a decision in the case of the Star Mining & Milling Company v. The Slocan Star Mining Company, in favour of the defendants, dismissing the action with costs against the plaintiffs.

The present high price of lead, which has now advanced to £16, has resulted in the withdrawal of the Dominion Government bounty on lead.

**Nelson.**—It is proposed to install an additional 15 stamps at the Referendum mill. The mill at present is using five stamps only.

As a result of ten days run, at the end of November, at the Wilcox mine, a gold brick was produced valued at \$5,000.00.

**Lardeau.**—At the clean-up of the Eva mine, for October, a gold brick was produced valued at \$5,000.00, while the estimated value of the concentrates for this period was \$1,000.00.

**Rosland.**—At a meeting of the shareholders of the White Bear Mining Company, held in Toronto on Nov. 16th. it was resolved to transfer the property and assets of the company to a trustee, prior to the formation of a new company, to be capitalized at a million dollars in 10 cent shares, shareholders in the old company to receive an equal number of shares in the new undertaking, subject to an assessment of 2 cents per share.

**Coast.**—Mr. F. O. Havey, an English engineer engaged by the directors of the Tyee Company to inspect their mines, has presented a preliminary report as follows:—

Firstly. The ore reserves cannot be safely estimated at more than 10,000 or 12,000 tons.

“Secondly. I see nothing to substantiate the assertion that ore ‘has to be found’ in depth. There is, of course, a possibility that such may be the case, though the conditions are not favorable.

“Explorations ought to be continued, and I shall recommend it, but with the most favorable results which may accrue from any work in this direction many months would elapse before new ore could be sufficiently developed to justify output on a proper basis, and it is therefore evident that unless the present ore body east opens out into something more than the position warrants me in estimating, the time must soon come when, for a period at least, the Tyee output will be entirely suspended. Under the circumstances, I felt justified in prolonging my visit a few days to inquire into the situation generally of the camps in the surrounding districts.”

Negotiations have been in progress for the sale of the Lenora mine to an English Company, for the sum of \$100,000.00, but two actions have been brought by creditors and others in the courts to prevent the sale being made.

The *Victoria Colonist* reports the sale of a number of iron properties on the west coast of Vancouver Island, on Bugaboo Creek, to a company represented in Victoria by Mr. I. B. Atkinson, M.E., for the sum of \$150,000.00.

**East Kootenay.**—A production of 150 tons a day is being maintained on the Sullivan group of mines, while developments are being continued by diamond drilling.

The Morning Star group of claims on Duck Mountain, near Sirdar, have been obtained by a syndicate of Denver, Colorado, investors. There is said to be a good showing of zinc ore on this property.

**Cassiar.**—During the past season the Rosella Mining Company installed a hydraulic plant and constructed a ditch in readiness for the commencement of active operations early next year.

**Nelson.**—The Arizona mineral claim, adjoining the Wilcox on Wild Horse Creek of the Ymir district, has been bonded for \$12,000.00.

Mr. Gilman Brown, who recently reported on the Ymir, gives it as his opinion that the body of high grade ore lately encountered in the 500 ft. level will probably be found at greater depth without diminution of the values, he in fact expresses the opinion that the vein is a fissure, though much disturbed and broken by dykes. Meanwhile operations are being continued at the 500, 600 and 1,000 ft. levels to the west. The present values are said to yield about an average of \$15.00 per ton of the new find.

**Lardeau.**—Returns from a recent shipment of 18 tons from the Mammoth at Camborne yielded \$2,431.52, after deducting freight and treatment charges.

At the Beatrice mine much development work is in progress and an aerial tramway 300 feet long has recently been erected.

The Metropolitan Gold & Silver Mining Company last month made final payments on the purchase of the Triune and Metropolitan groups, paying for the former \$35,000.00, and for the latter \$100,000.00. The company has also repurchased the shares allotted to Messrs. Ferguson Bros. Extensive development work will be proceeded with early next spring.

**Slocan.**—It is reported that Messrs. P. Burns and W. J. Wilson have purchased the Highland mine, near Ainsworth, from the Highland (Kootenay, B.C.) Company, represented in Nelson by Mr. J. Laingstocks. The mine, which is a silver-lead property, has been in operation since 1900, and has made large shipments of ore to the Nelson smelter.

Mr. G. Houston, editor of the *Sandon Mining Standard*, in an interview with the *Nelson Daily News*, recently stated that he regarded the outlook in the Slocan as being distinctly better than it has been for some years past. He added that much development work was in progress and in contemplation, while the leasing system was coming into more general vogue.

Magnetic separation was being thoroughly tested at the Kootenay Ore Company's works at Kaslo, while the new Frank zinc works were likely to successfully compete with foreign bidders for the treatment of the zinc ores of the district.

A new strike is reported to have been made on the Slocan Star mine, a fine body of clean ore having been encountered in No. 4 level of the Silversmith.

Speaking of conditions in the region tributary to Silverton, Mr. Wm. Hunter is reported to have said that the general feeling in the camp is better than it has been for some time past, this being attributable largely to the high prices now obtainable for silver and lead. Three important mines are now being worked in the vicinity, namely, the Emily Edith, Hewitt and Wakefield, the product from which is being shipped to the Hall Mines Smelter, and averages three carloads of high grade ore weekly. Mr. Hunter expressed the opinion that Silverton and other Slocan towns had “touched rock bottom and are now on the up grade.”

#### YUKON.

In speaking of mining operations in the Yukon during the past season, Mr. E. E. Blackwood, the Victoria agent of the Northern Pacific Railway Company, stated that much was expected from the operations of the recently installed dredges in the territory. The Bear Creek dredge was in operation for about two months before work was suspended on account of frost, and the average clean-up for every 24 hours, with two shifts of 7 men each, was \$4,000.00. The chief cost in the operation of dredges is the high price of fuel, but when the Klondike Mine railway is completed it will be possible to obtain coal from the Tantalus mine at a relatively low cost. The dredge at Bonanza Creek was completed too late to be operated last season, but work will be commenced early in the spring. As a result of the successful operation of the Bear Creek dredge, however, three more dredges have been ordered for working in the Yukon. These appliances are of the most modern design, and the two dredges in the territory cost respectively \$250,000.00 and \$150,000.00.

It is reported that platinum has been found in important quantities on the Little Shookum gulch, on Bonanza Creek.

#### ONTARIO.

The discovery of a large body of magnetite is reported to have been made near Eagle Lake, 20 miles south of Wabagoon.

The Temiskaming & Hudson Bay Mining Company have declared a dividend of \$2.00 per share on its capital, or the equivalent of 200 per cent.

The Lake Superior Corporation, it is said, has recently received orders for steel rails sufficient to keep the mill in continuous operation for some time to come. Among others the company has a large order from the Michigan Central Railway for one hundred pound rails, while also large orders have been received from the Canadian Pacific Railway.

The *Petrolia Advertiser* states that the Beaver Oil and Gas Company completed a well on the Roberts farm near Bothwell. This is undoubtedly one of the most important test wells drilled in the Province of Ontario during the past year. The Bothwell field has produced much oil in the past forty years, but the oil heretofore has always been produced in the shallow (Carniferous) sand. But the Beaver Oil Company's test well was dry in this formation and was drilled through the Shallow Pay to the Leamington (Clinton) sand. The Clinton Sand was encountered at a depth of 1,230 feet and at 1,250 filled up 175 feet. This find has set oil men thinking, as it was generally believed that no oil could be produced below the Carniferous sandstone.

Operations have been resumed at the Black Eagle mine, Lake of the Woods district, where it is proposed to continue sinking on the main vein.

At the Grace mine, at Eagle Lake, a 5-stamp mill is being installed.

At the Big Master mine it is proposed to increase the capacity of the mill by an additional five stamps.

It is proposed to continue extensive development work at the Redeemer mine, near Dryden, where a large force of men has been engaged to sink another shaft to a depth of 300 feet and run a tunnel 400 feet to connect with the present shaft.

The advantage of a low capitalization of mining companies is rather well instanced in the case of the Temiskaming & Hudson's Bay Mining Company, operating in the Cobalt area. This undertaking recently realized \$70,000.00 on a shipment of ore, and has thus been enabled to pay to its shareholders the substantial dividend of \$2.00 per share, or 200 per cent. on the capital of the company.

In the Manitou district there is considerable activity at the present time. Crosscutting is being carried on at the 114 ft. level in the main shaft of the Gold Rock M. & M. Company's mine. At the Big Master the stamp mill is crushing steadily, while the compressor and boiler building at the Paymaster is completed and preparations are in progress for a continuance of steady mining operations. Col. J. H. Buxton is now in charge of the Ideal, near Dryden, and is making extensive improvements to that property, where a mining plant is to be installed. At the Minnehaha Mining Company's smelting property the contract for 50 feet of work was recently completed, and samples taken from the shaft gave very high average values over \$400.00 per ton.

An Order-in-Council was passed last month reducing the area of mining claims from 40 to 20 acres. On the 28th of August last, the recording of mining claims in the four townships of Coleman, Lorraine, Bucke and Dymond, was suspended for the time being. It is now provided that these applications may be recorded on condition that the applicants become bound by any amendments and additions to the mining laws and regulations that may be made by the Legislature at its next session in regard to working conditions, taxation and all other matters whatsoever. This does not affect Cobalt Lake, Kerr Lake and the Gillies limit. No reduction is made in the area of mining locations in the townships of Lorraine, Bucke and Dymond.

#### NOVA SCOTIA.

The Boston Elevated Railway recently ordered from the Dominion Steel Company a sample shipment of rails to be used on the curves of that line. The maximum life of the curves on the Boston elevated is 43 days, and it is confidently expected that owing to their exceptional wearing qualities, the Sydney rails will show an advantage of at least 50 per cent. over those hitherto used. Meanwhile the output of the company's areas at Bell Island this season will reach the total of 400,000 tons, all of which has been brought to the company's works in Sydney. This is the largest importation for any year in the history of the company.

Mr. Lawrence Godkin has been appointed receiver of the Colonial Copper Company, owning copper mines in Nova Scotia and other portions of Canada.

The Dominion Iron & Steel Company propose increasing the capacity of the plant this winter by adding two Bessemer converters. The Company anticipate being in a position next year to make a monthly production of at least 20,000 tons of steel products.

#### COMPANY MEETINGS.

**The Big Dipper Mining Company.**—A meeting of the shareholders of this Company was held in Peterboro on the 21st November, the following directors and officers being elected:—President, Mr. J. M. Fletcher, Buffalo, N.Y.; Vice-president, Mr. J. J. Tisdale, Buffalo, N.Y.; Secretary-treasurer, Mr. J. S. Waldron, Peterboro; Superintendent, Mr. Jno. Jamieson, Myer's Cave, Ontario; Directors Mr. S. Sager of Peterboro, and Messrs. Wilson, Haywood and Bradley of Bolivar, N.Y. The company's property, which is situated in Barrie township, is turned over to the company free of all incumbrances. It is reported that very good results have been obtained from the assays made on ore from the Calumet and Hecla mines. The company is offering 50,000 shares per subscription at 25 cents per share.

**McKinley Mines, Limited.**—At the annual meeting of the company, held in November, the following directors were appointed. Mr. B. Lequime, President, and Messrs. C. R. Hamilton and A. B. McKenzie of Rosland, H. W. Worrington and D. Whiteside of Grand Forks. Mr. M. O'Brien of New York was appointed General Manager of the company.

**Young's Lake Mining Company of Ontario.**—An adjourned meeting of this company was held on the 1st of December, when it was decided to give an option on a part of the property to American investors, for \$66,000.00, under working conditions. The Company's property adjoins the Shakespeare Gold Mines near Webbwood.

**Cariboo Consolidated.**—At a meeting of this company, held in London on November 11th, a resolution to increase the capital to £200,000, at a creation of \$200,000.00, the preference shares at 2s. each, was carried unanimously.

**Granby Consolidated.**—At an extraordinary meeting, held in Boston on December 1st, resolutions were passed increasing the number of directors from twelve to fifteen, and Messrs. G. C. Clark, S. H. Steele and E. Thorne were elected members of the Board. It was also resolved to make application to the British Columbia Legislature to increase the par value of the stock from \$10.00 to \$100.00 per share. The by-laws were amended in several respects to conform with the Board's amended charter, and the directors were authorized in future to declare dividends without reference to shareholders. A dividend of 3% was declared on the capital stock of the company, payable on January 15th, out of the next earnings of the company. The books close on Dec. 19th, and are re-opened on January 16th. Shares to the number of 980,000 were represented at the meeting.

#### COAL NOTES.

**Alberta.**—The coke ovens at Coleman are in full operation and when the shaking screens are installed, No. 4 seam at the mine will, it is expected, be capable of producing 2,000 tons a day.

#### NOVA SCOTIA.

In operating between the slopes and the McGregor pit the Acadia Coal Company passed through in November another large seam of coal, of good quality, 19 feet in thickness.

The Dominion Coal Co. has recently received a number of large orders for early delivery. These include an order from the Boston & Maine Railroad for 75,000 tons; Johnston & Co., Stockholm, for 5,000 tons, while the Steel Company consumed regularly 6,000 tons per month. It is estimated that the production of the Coal Company during the first three months of next year will be in the vicinity of 800,000 tons, in order to meet the trade requirements.

Slack is in great demand at the present time and is selling at from 60 to 70 cents per ton at Pittsburg. Recent quotations, however, are: Run-of-mine at 75 cts., three-quarter screened and one-half screened at \$1.40 at the mines.

The Eastern Coal Company, with a capital of \$500,000.00, was recently incorporated to operate a coal property south of the Smith mine, at Maccan. It is proposed to equip the mines with a modern machinery plant, with the idea of producing 500 tons daily. The following gentlemen constitute the directorate of the new company:—President, Senator J. K. Kerr, K.C., of Toronto; Vice-President, Wm. Dineen, of Toronto; The Hon. Richard Harcourt, M.P.P., Toronto; Mr. Jas. B. Tudhope, M.P.P., Orillia; Mr. A. J. H. Eckhardt, Toronto, Mr. W. Munns, and Mr. A. Alfred Laurie, Treasurer.

#### MINING INCORPORATIONS.

##### ONTARIO.

**The Cambrian Mineral Company, Limited.**—Capital \$100,000.00 in shares of \$1.00 each. Head Office: Tilbury, Ontario.

**The Miramichi Quarry Co., Limited.**—Capital \$90,000.00 in shares of \$100.00 each. Head Office: Montreal, Que.

**The Silver Gulch Mining & Prospecting Company, Limited.**—Capital \$75,000.00 in shares of \$1.00 each. Head Office: Cobalt. Provisional Directors: Messrs. Louis Henry Timmins, Richard Anson Cartwright, Wm. Chas. Le Heup, Theodore John Harwood and David Alexander Dunlap.

**Cobalt-Merchants Mining Company, Limited.**—Capital \$200,000.00 in shares of \$1.00 each. Head Office: Toronto. Provisional Directors: Messrs. Hamilton Bender Wills, Robert Falconer and Whitford Vandusen.

**Cobalt Development Company, Limited.**—Capital \$1,000,000.00 in shares of \$100.00 each. Head Office: Toronto. Provisional Directors: Messrs. Thos. Henry Hamilton, Perry Lynes Hobbs, Ewan MacKenzie, Charles Magee and Geo. Stevenson.

**The Cobalt-Canadian Mining & Milling Company, Limited.**—Capital \$500,000.00 in shares of \$1.00 each. Head Office: Kingsville. Provisional Directors: Messrs. Seger Lincoln McKay, Bon Jasperson, Geo. Jasperson, Darius Wigle, Wm. Albert Smith and Henry James Cooper.

**The Ontario Minnesota Mining Company, Limited.**—Capital \$60,000 in shares of \$1.00 each. Head Office: Port Arthur. Provisional Directors: Josiah Davis Essign, Geo.



Alfred Elder, Victor Stearns, Wilfrid Washington Blackshaw and Geo. Frank Piper.

Gordon Cobalt-Silver Mining Company, Limited—Capital \$200,000.00 in shares of \$1.00 each. Head Office: Toronto. Provisional Directors: Messrs. John Francis Lennox, James Duncan Lamont, Wm. Nassau Irwin, Sidney Brown Woods, Thos. Herbert Lennox.

Margaret Mining Company, Limited.—Capital \$40,000 00 in shares of \$100.00 each. Head Office: Toronto. Provisional Directors: Messrs. Henry Martyn Chance, Alexander Fasken and Harper Armstrong.

The Annie Mining Company, Limited. Capital \$40,000 00 in shares of \$100 00 each. Head Office: Toronto. Provisional Directors: Messrs. Henry Martyn Chance, Alexander Fasken and Harper Armstrong.

The Isa Mining Company Limited. Capital \$40,000 00 in shares of \$100.00 each. Head Office: Toronto. Provisional Directors. Messrs. Henry Martyn Chance, Alexander Fasken and Harper Armstrong.

The Annabella Mining Company, Limited.—Capital \$40,000.00, in shares of \$100.00 each. Head Office: Toronto. Provisional Directors: Messrs. Henry Martyn Chance, Alexander Fasken and Harper Armstrong.

The Louise Mining Company, Limited.—Capital \$40,000.00 in shares of \$100.00 each. Head Office: Toronto. Directors: Messrs. Henry Martyn Chance, Alexander Fasken and Harper Armstrong.

Temagami Mining and Milling Company, Limited.—Capital \$40,000.00 in shares of \$100.00 each. Head Office: Toronto. Provisional Directors: Messrs. Chas. Lake Beckwith, Louis Oscar Hedden, Walter Eugene Thatcher, Eugene Blything Hedden, John Blair Wilson, Frank Louis Luff, Edwin James Meeker, Robert Newell Brundage and Frederick Frelinghuysen Guild.

The Silver Five Mining Company, Limited.—Capital \$40,000.00 in shares of \$1.00 each. Head Office: New Liskeard. Provisional Directors. Messrs. James Matthews, Wesley McKnight, Donald Stewart, Walter Harold Roebuck and Henri Loudin.

Temiskamingue Reduction Works, Limited.—Capital \$166,000.00 in shares of \$100.00 each. Head Office: Village of Cobalt. Provisional Directors: Messrs. Peter Kirkegaard, Chas. Lewis Benedict and George Ritchie.

#### BRITISH COLUMBIA.

Pingree Mines, Limited.—Capital \$600,000 00 in shares of \$1.00 each.

Western Hydraulic Mining Company, Limited.—Capital \$150,000.00 in shares of \$5.00 each.

Wormwood Creek Mining Company, Limited.—Capital \$10,000.00 in shares of \$1.00 each.

#### INDUSTRIAL AND MACHINERY NOTES.

The Le Roi No. 2 company is installing a 150 H.P. electric motor, supplied by the Canadian General Electric Company.

We have received from the Westinghouse Machine Company, East Pittsburg, Pa., copies of two recently issued catalogues, namely: *Westinghouse Railway Apparatus*, and the *Westinghouse Standard Engine*. Both these catalogues are handsomely illustrated and printed. It is claimed for the Standard Engine that in points of economy it is unequalled by any other simple, non-condensing, single valve engine made.

The Denver Fire Clay Company send us a very complete catalogue of assayers' and chemists' supplies. The book contains upwards of 350 pages, and is really useful for reference purposes.

The St. Louis office of the Sullivan Machinery Company, of which Mr. P. H. Jarvis is manager, has been removed into more commodious premises in that city, in order to provide for the requirements of an increasingly large business. The new St. Louis address of the firm is now: Rooms 1125A.—1127 Missouri Trust Building.

Catalogue No. 20, issued by the Jeffrey Manufacturing Company of Columbus, Ohio, deals with the subject of *coal handling machinery*. The subject is very comprehensively discussed and profusely illustrated with diagrams and half-tone blocks.

The Industrial Engineering Company of America, 32 Broadway, New York, send us particulars of a new roughing lathe, which, it is claimed, embodies in its design features far in advance of any machine now in the market, being principally designed to make the most efficient use of the new high speed steels. For use in connection with this machine two extremely efficient attachments have been devised. The machine can be built in any desired size.

The Canadian Westinghouse Company, Limited, has received an order from the Granby Company of Phoenix, B.C., for a 250 H.P. electric motor.

The Jenckes Machine Co., Limited, of Sherbrooke, Que., has recently shipped a 14"x20" Double Drum Lane Friction Winding Engine, drums 72" diameter x 36" face, to the Dominion Coal Co., Limited, Glace Bay, C.B., and is at work on a Single Drum Hoist of the same size for the same company.

The crushing plant of the American Asbestos Co. at Black Lake has been increased recently by the addition of two 40x6 Farrel Bacon style "B" Duplex Crushers of which The Jenckes Machine Co., Limited, of Sherbrooke, Que., are sole builders in Canada.

The Jenckes Machine Co., Limited, Sherbrooke, Que., has received an order from the Granby Consolidated Mining, Smelting & Power Co., Phoenix, B.C., for a 150 H.P. Double Drum Electric Hoist. The dimensions of the drums, which will be conical in shape, are 7' diameter at the larger end, 5' diameter at the smaller end and 5' long. By means of friction clutches each drum can be operated independently of the other, and both drums are also controlled by powerful brakes. The capacity of this hoist is a load of 10,000 lbs. raised at a rate of 700' a minute, and the shipping weight is in excess of 50,000 lbs.

The *Nelson Daily News* states that: "The biggest lead smelting furnace in the world is being manufactured in Nelson by the Kootenay Engineering Works. It has been ordered for the Canadian Reduction Works at Trail. Already the company has several large furnaces, probably equal or nearly equal in size to any others in use anywhere. The one now ordered from and in process of manufacture by the Kootenay Engineering Works is half as big again as the largest now in operation at Trail."

At no time, perhaps, in the history of the United States has its export trade been so great as it is at present, this being especially true in regard to high grade power machinery. The recent impetus given to the development of the far east is responsible for a considerable part of this increase, but it is also largely due to the fact that American machinery is now universally conceded to have no superior in design or workmanship. During the past two months The Westinghouse Machine Company, of East Pittsburg, Pa., has looked many orders from foreign countries. Some of the important steam engine orders follow:—One 16" and 34" x 16" Marine type vertical cross compound engine for the Kure Arsenal, Japan, four 16" and 34" x 16" Marine type and two 84" x 8" standard steam engines for the Tehuantepec Railway of Mexico, one 11" and 19" x 11" compound steam engine for the Furukawa Western Bureau, Japan, one 134" x 12" standard steam engine for the Hokkaido Tanko Railway Company of Japan, two 10" and 18" x 10" compound steam engines for the Kuskiu Railway of Japan, one 14" and 24" x 14" compound steam engine for the Imperial Printing Office of Japan, one 9" and 15" x 9" compound steam engine for Graham Brothers, Stockholm, Sweden, one 18" x 16" compound steam engine for the Rio de Janeiro Tramway Light & Power Company of Brazil, and one 18" x 16" standard steam engine for the Santa Cecilia Sugar Company of Cuba.

When the large Union Station at the Washington terminal of the Pennsylvania Railroad is completed, it will be one of the finest and best equipped railroad stations in the world, serving all incoming and outgoing trains of Washington. In conformity with the rest of the station the power plant will be equipped with the most up-to-date and best machinery obtainable, steam turbines being selected as prime movers partially on account of the limited amount of space devoted to that purpose. Four 500 kw. steam turbines have been ordered from The Westinghouse Machine Company, of East Pittsburg, Pa., adapted for driving alternating current 60 cycle generators running at 3,600 r.p.m. Dry saturated steam will be used at 150 pounds pressure and 25" vacuum, and the turbines will be capable of developing 670 electrical horse power each. The alternating current generators will be of the turbo rotating field type with two poles and a frequency of 7,200 alternations per minute at a normal speed of 3,600 r.p.m. They will deliver three-phase current at 2,300 volts, and, being of the enclosed type, will operate practically without noise.

The North Carolina Granite Corporation of Mt. Airy, N.C., is now installing a Sullivan Corliss, two stage air compressor for driving the Sullivan drills and other compressed air appliances, used at its quarries. This compressor has a capacity of 2,000 cu. ft. of air per minute, at 75 revolutions, and is an excellent example of modern practice in air compression, as regards fuel economy and air efficiency. The air cylinders are connected to a Sullivan Corliss, cross compound, condensing steam end, especially designed and proportioned for this purpose. The air inlet valves are of the Corliss type, operated by independent eccentrics, and the discharge valves on both cylinders are of the automatic poppet type, moving in a direction parallel with the piston rod, with removable seats located in the cylinder heads. The devices for cooling the air during compression are unusually efficient. A similar machine is installed at the works

of the Southern States Portland Cement Co., at Rockmart, Ga., and has given very efficient service during the two years that it has been in operation.

Owing to the rapidly increasing Southern business of the past year the De La Vergne Machine Company, of New York has established a branch agency at Atlanta, Ga. We understand this agency is to cover the States of North Carolina, South Carolina, Alabama, Florida and Georgia. This agency will handle business connected with the three lines of machinery manufactured by the De La Vergne Machine Company, viz.: Refrigerating and Ice Making Machinery, "Hornsby-Akroyd" oil engines and Koerting gas engines. Their representative will be Mr. W. M. Hargreaves, and the office will be located at 510 Candler Building.

Owing to the increase of business and growing importance of Montreal as a center for distribution of their products, the Robb Engineering Company has decided to change their agency at Montreal, into a branch office. Mr. Watson Jack has been appointed manager, and Mr. Alister Maclean will continue in the capacity of engineer for the Montreal district. The Robb Engineering Company will have their quarters in the handsome suite of offices occupied by Watson, Jack & Company in the Bell Telephone Building, corner of Notre Dame and St. John Street.

The interests controlling the Bedford Quarries Co., of Bedford, Indiana, and the Ohio Quarries Co., of North Amherst, Ohio, with head offices at Chicago, are planning to largely increase the output of their limestone and sandstone properties at the above points. The new equipment required at the quarries next year will include 18 Sullivan stone channeling machines, which has just been ordered through Mr. George D. Hunter, the representative of the Sullivan Machinery Co., at Bloomington, Ind. These machines are of the class "Y" rigid head type, with boiler. This channeler has been developed especially for the needs of the building stone districts, and for several years has been the standard machine in use. The two companies above named have made exhaustive tests of channeling machines, and the Sullivan type was selected on account of its superior cutting capacity, and its economy and convenience in operation. The Bedford Quarries Co. already has 10 machines of this type in use, while the Ohio Quarries Co. has eight similar machines, especially adapted for cutting sandstone at its North Amherst quarries. We illustrate one of the quarries in the Bloomington-Bedford district, showing this type of channeler and the method of operation. The Consolidated Stone Co. has also ordered four of the new class "Y" Sullivan Colitic type channelers with 8" cylinders, for use at its quarries at Bloomington and Bedford. This company will then have 21 Sullivan machines at these two properties. The New York office of the Sullivan Machinery Co., has also secured from F. A. Maselli & Co. an order for two class Y-6 channelers and several rock drills, for use at Rochester, N.Y., on the Erie Canal improvements.

## THE DEVELOPMENT OF CANADIAN-MEXICAN TRADE.

Great interest is now being taken in the development of trade between Canada and Mexico, and capitalists are looking towards that country and its resources and development with greater interest each year. Not only is Mexico attractive to the Canadian from a trade standpoint, but as is well known, it is one of the most interesting countries in the world to visit during the winter months. To give all those who contemplate a trip to this wonderful southern country, (which anyone who can afford the time and expense should do) the Grand Trunk Railway System are organizing a special excursion that will give the best opportunity to tourist and business men to cover the whole of Mexico.

This tour will leave Montreal in special Pullman sleeping cars on the morning of January 29th, connecting at Chicago with the special Pullman train that will leave there at 10.00 a.m. January 30th, proceeding south through St. Louis, San Antonio and Laredo into Mexico. The itinerary is made to include all of Mexico that is of interest to the traveller for pleasure and extending the scope and time far beyond the lines and dates of the ordinary tour, making leisurely stays here and there in the Capital and other important cities.

The tour will be under special escort and in charge of Mr. Reau Campbell, General Manager of the American Tourist Association, who is the best posted authority on Mexico in America, and who has accompanied like parties to that country every year for the past twenty-five years.

Great interest is being taken throughout the country regarding these special excursions and there is no doubt that a representative party will leave Canada for the first of these tours. Another tour is in contemplation for the latter part of February.

Literature, rates and further information is given to all by Mr. S. Quinlan, at Bonaventure Station, Montreal

## COMPANY NOTES.

**Le Roi, No. 2.**—The copper returns of this mine were as follows:—Ore shipped 680 tons; net receipts \$17,950.00, being payment for 807 tons shipped, and \$1,633.00 being payment on 57 tons of concentrate shipped, or total \$19,583.00.

**Le Roi.**—The October shipments amounted to 8225 tons—to Northport smelter 2150 tons, to Trail smelting works, 6075 tons—containing 2930 ounces of gold, 3750 ounces of silver, and 187,600 pounds of copper; estimated profit on the ore after deducting cost of smelting, mining, realization and depreciation, \$19,500; expenditure on development during the month, \$11,000.

**Cariboo Consolidated.**—An extraordinary general meeting of this company has been called for the purpose of passing resolutions to increase the capital of the Company to £220,000 by an issue of preference, additional capital being required, as the gravel so far opened is not dry enough to permit of extensive breasting operations, and it is therefore considered necessary to drive the main east tunnel some hundred feet further in, in order to keep ahead of the gravel blocked out while it is drying, and thus admit of the recovery of gold without overtaking the development work. The width of the channel at present being worked is some 160 feet. One of the directors who recently visited the property reports that the spasmodic breasting work to date has resulted in the recovery of over 450 ounces of gold under adverse conditions.

## SOCIETY MEETINGS.

### SOCIETY OF CHEMICAL INDUSTRY.

At a meeting of the Canadian section of the Society of Chemical Industry in Toronto, Mr. Nieghorn, Manager of the Canadian Chemical Company, London, announced that a company was prepared to invest \$1,500,000 in a plant to utilize the silver ores of Hastings and to extract sulphuric acid by the contact process. The works will be in the neighborhood of Tweed and will give a great stimulus to mining in Eastern Ontario. At the same meeting Prof. Lang, of Toronto University, read a paper giving the result of some of his observations during a summer trip to British Columbia. He spoke most hopefully of the future of the iron industry in that province, where ore, coal and limestone are found in close proximity. Speaking as a chemist he was much impressed with the Trail smelter, which he looked upon as a fine chemical industry. He hoped to see something done to save the platinum, osmium and mercury which are found in that province. J. P. Murray expressed regret that Canadian ores should have to be sent to the United States for treatment and suggested that the Federal Government should take some steps in the matter. Prof. W. G. Miller thought that the appropriation for the Geological Survey, which is the same as 25 years ago, might be increased.

## THE WAR EAGLE-CENTRE STAR AMALGAMATION.

(From a Special Correspondent).

The shareholders of War Eagle and Centre Star at their meetings in Toronto on the 23rd and 28th of November respectively, sanctioned the amalgamation of the two companies. The Centre Star Co. takes over all the assets of War Eagle, giving therefor two shares of Centre Star for three of War Eagle. The number of shares so transferred, and to be divided pro rata among the shareholders of War Eagle, is 1,166,667. The capitalization of the amalgamated companies will be \$4,666,667, of which \$3,500,000 is Centre Star. The management hope by using one shaft for the two mines, and other economies, to effect a saving of from \$25,000 to \$30,000 a year. With reference to a greater amalgamation of Rossland properties it was announced that though it had been considered nothing definite had been done. For some time War Eagle has been paying expenses but little more. Recent tests at Centre Star with the diamond drill gave encouragement. The financial year for Centre Star will henceforth close on December 31st instead of September 30th, and the annual meeting will be held on the fourth Tuesday of February instead of in November.

## MAJOR DAVID BEAMES.

Late I.S.G., and of Berkhamstead, England.

If the above will communicate with C. J. Walker's Advertising Agency, 24 Coleman Street, London, England, he may hear of something to his advantage.

# 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 thereon; in concessions for the mining of the inferior metals, those only may be mined for.

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

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

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

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

The fullest information will be cheerfully given on application to

**THE MINISTER OF LANDS, MINES AND FISHERIES,**

PARLIAMENT BUILDINGS, QUEBEC.



# Ontario's

## MINING

## LANDS

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

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

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

The output of iron, copper and nickel in 1903 was much beyond that of any previous year, and large developments in these industries are now going on.

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

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

The climate is unsurpassed, wood and water are plentiful, and in the summer season the prospector can go almost anywhere in a canoe.

The Canadian Pacific Railway runs through the entire mineral belt.

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

**HON. FRANK COCHRANE,**

Commissioner of Lands and Mines.

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 lands 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 condition 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. W. T. PIPES,

Commissioner Public Works and Mines,

HALIFAX, NOVA SCOTIA.



# DOMINION OF CANADA

## SYNOPSIS OF REGULATIONS

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

#### COAL.

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

#### QUARTZ.

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

A free miner's certificate is granted for one or more years, not exceeding five, upon payment in advance of \$7.50 per annum for an individual, and from \$50 to \$100 per annum for a company, according to capital.

A free miner, having discovered mineral in place, may locate a claim 1,500 x 1,500 feet by marking out the same with two legal posts, bearing location notices, one at each end on the line of the lode or vein.

The claim shall be recorded within 15 days if located within ten miles of a mining recorder's office, one additional day allowed for every additional ten miles or fraction. The fee for recording a claim is \$5.

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

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

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

#### PLACER MINING.

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

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

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

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

Department of the Interior.

Ottawa, February, 1904.

#### DREDGING IN THE YUKON TERRITORY.

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

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

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

#### PLACER MINING IN THE YUKON TERRITORY.

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

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

The person or company staking a claim must hold a free miner's certificate.

The discoverer of a new mine is entitled to a claim of 1,000 feet in length, and if the party consists of two, 1,500 feet altogether, on the output of which no royalty shall be charged, the rest of the party ordinary claims only.

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

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

Work must be done on a claim each year to the value of at least \$2200.

A certificate that work has been done must be obtained each year; if not, the claim shall be deemed to be abandoned, and open to occupation and entry by a free miner.

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

#### PETROLEUM.

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

**W. W. CORY,**

**Deputy of the Minister of the Interior.**

# DEEP DRILLING

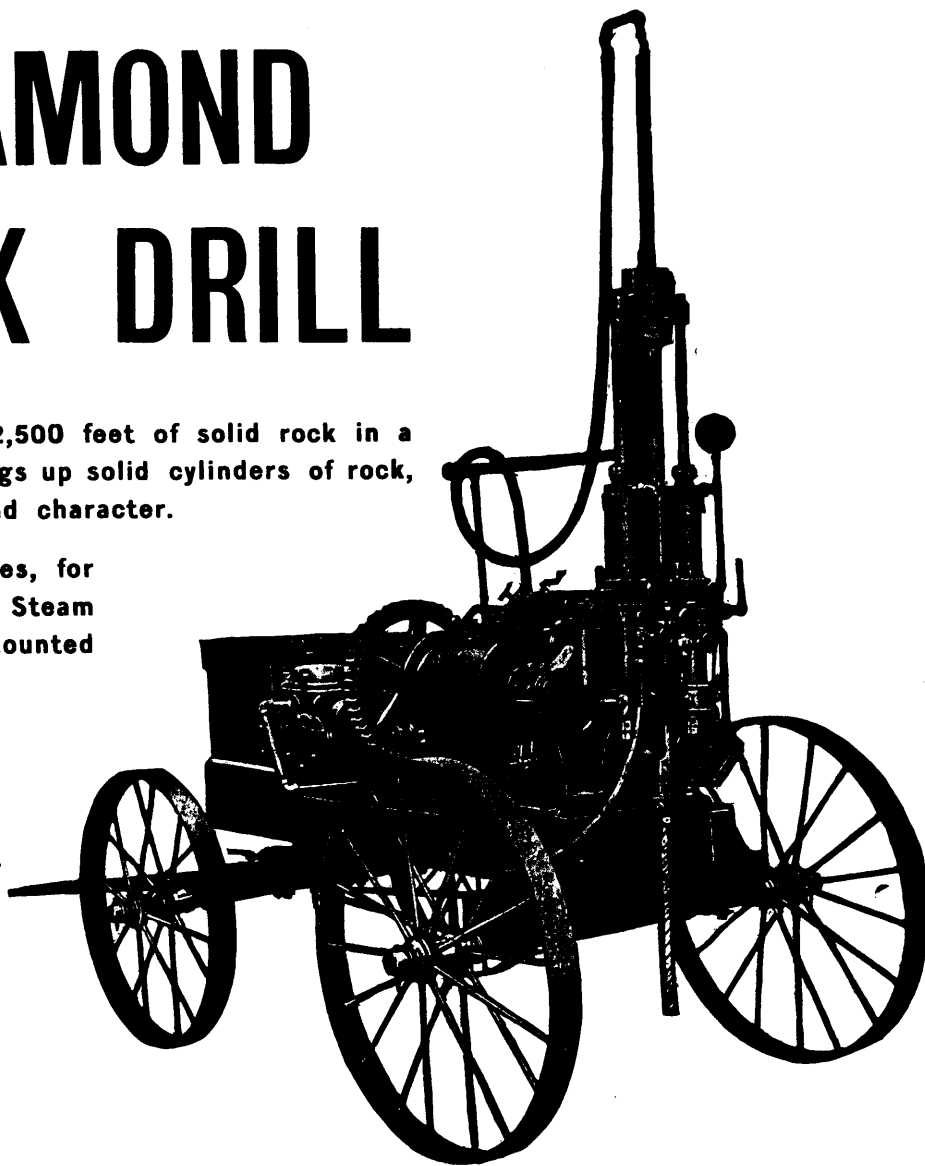
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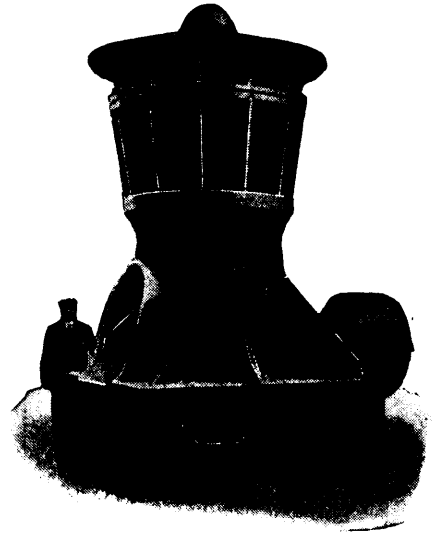
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WE MANUFACTURE JAW BREAKERS, CRUSHING ROLLS,  
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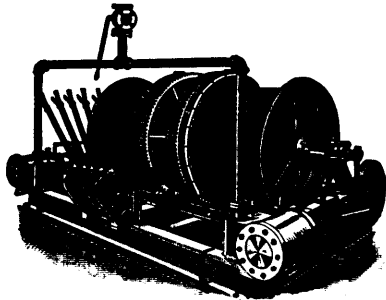
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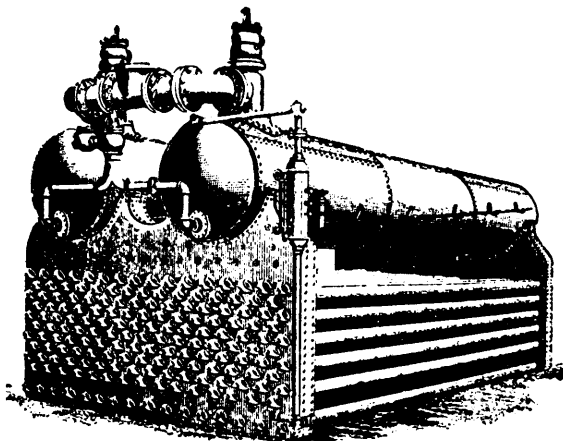
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Wire specially selected for own exclusive use.  
We have made many records with our Winding, Haulage and Crane Ropes.

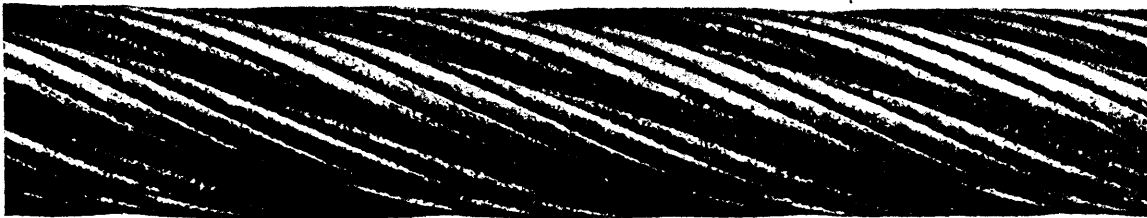


Illustration of Winding Rope, 240 fms. long x 3½ circ., Galvanized Special Improved Patent Steel, Compound make, supplied to Kenneil Collieries, Bolness, Scot., which gave a record life of 6 years and 2 months. Showing condition when taken off.

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

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W. H. Thorne & Co., Ltd., Saint John, N. B.

Drummond, McCall & Co., Montreal.  
John Burns, Vancouver, B. C.

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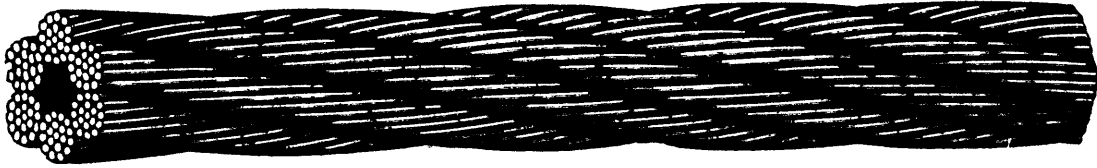
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General Offices: Canada Life Building - MONTREAL.

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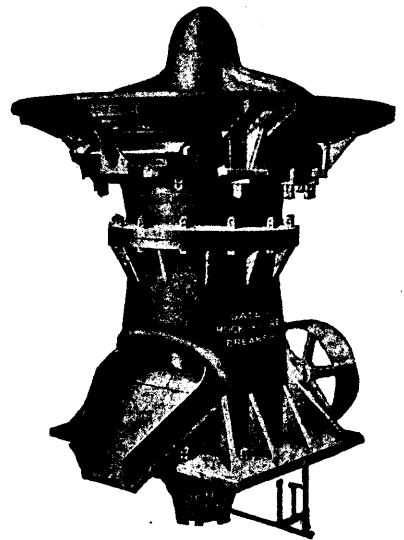
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