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19th YEAR OF PUBLICATION.

The CANADIAN MINING REVIEW

Established 1882

AN ILLUSTRATED MONTHLY JOURNAL OF INFORMATION FOR MINE MANAGERS AND MINING ENGINEERS.

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

EDITED AND PUBLISHED BY

B. T. A. BELL,

Secretary of The Canadian Mining Institute,
Secretary of The General Mining Association of Quebec,
Secretary of The Ontario Mining Protective Association,
Hon. Secretary of The Mining Society of Nova Scotia.
Secretary, Canadian Mica Miners' Association.

1901.

VOLUME XX.

EDITORIAL OFFICES:
SLATER BUILDING, - OTTAWA, CANADA.

INDEX TO VOLUME XX.

INDEX—Continued.

NINETEENTH YEAR OF PUBLICATION

The Canadian Mining Review

Established 1882

Vol. XX—No. I. OTTAWA, JANUARY 31st, 1901. Vol. XX—No. I.

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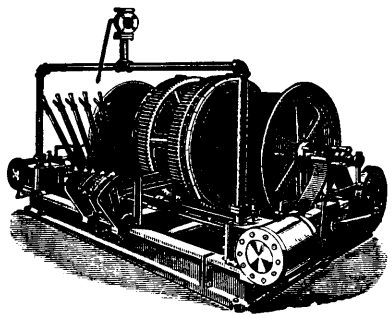

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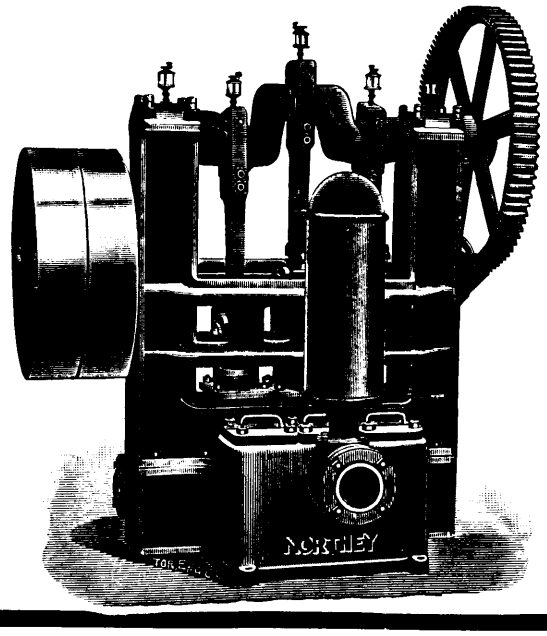

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19th YEAR OF PUBLICATION.

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B. T. A. BELL, Editor and Proprietor.
Secretary, Canadian Mining Institute, etc.

Published Monthly.

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VOL. XX., No. 1. JANUARY, 1901. VOL. XX., No. 1.

Some Features of Canadian Mining in 1900.

The past year has witnessed the general collapse in Canada of "paper mining"; the mining stock boom has disappeared and, we hope, finally, so far as it was dependent upon the exertions of *men* and not upon the records of *mines*. The reaction began in British Columbia in the year 1899, and our western friends, with their usual foresight, attempted to get under cover early in the past year when the notable collapse of the "War Eagle" stock occurred Some reorganization has been effected in British Columbia properties and they are now on the straight road to recovery, provided they were originally founded on merit; but where their claim to recognition was shadowy in the first place it is probable that they will never be heard of again. The declines in the high-priced Boundary Creek ventures, such as "Knob-Hill," "Old Ironsides," and some others of that section, was predicted and anticipated by those conversant with the difficulties attendant upon getting $6 out of $5 ore. The similarity between the sudden rise and long inflation of these stocks and the features attending the "War Eagle" stock, led many people to predict a similarly sudden collapse. After the present depression has culminated, and the atmosphere is once more cleared, we are of the opinion that values in British Columbia will be closer to actual worth than ever before, and that the industry as a whole will be in a far healthier condition. The public may then look for some real mining to be done and for values based upon the intrinsic merits of the properties concerned. One of the brightest features in the whole of the British Columbia market has been the successful year of the Cariboo Consolidated Hydraulic Co. and the rise of this stock in consequence; readers of the REVIEW may remember that this is one of the enterprises which we have been able to commend almost unreservedly, and we are not afraid to predict that the company will be one of the brightest stars in the firmament of British Columbia.

Coming easterly to the Province of Ontario the status of the nickel and allied copper mines is most satisfactory; the establishment of a refining plant by the Orford Company, the introduction of large capital by the Mond Company and the erection of their large works, the reopening of the old Bruce mines under modern management and with modern machinery, and the very extensive, in fact one may say huge, operations of the Clergue Syndicate, all point to a most satisfactory ultimate condition of the metal mining industry in Ontario. The gold industry of Eastern Ontario in Hastings County is also reported as very satisfactory, and (what is of more importance) as decidedly profitable, but when one comes to consider the Western Ontario gold fields one does not feel so optimistic; in fact the year 1900 has seen a condition of affairs in the Lake of the Woods district which is something worse than can be seen anywhere else in the Dominion.

The past year noted the gradual death of the second boom in this section. Although the Government have made no public announcement of the production of gold for the past year it is estimated, by those who have had access to the figures and are competent to judge, that the yield will not be much in excess of $300,000, whereas the production for 1899 was 424,000. During the last six months of the year mining can be said to have been dead in the gold fields of Western Ontario; all the work in the Rainy River section has ceased, and efforts to obtain new capital for some of the most promising properties in that section are not favorably entertained; in the northern section, although small returns were obtained from custom lots milled, yet the only producing mines were the Sultana and the Mikado. Since the transfer of the Sultana mine to a London corporation about eighteen months ago this property has been travelling fast upon a down-hill road. The Mikado, which from reliable and credible reports appears to be a property of considerable merit, has been hampered almost from the start by incompetent handling. The production of this property has been sufficiently large to have justified the payment of considerable dividends, but the amount disbursed has been entirely incommensurate with the bullion produced and we think our subsequent remarks fully applicable to this property.

The question of why a boom twice repeated in this country has failed to make known some permanently remunerative properties, is as pertinent as ever. It can safely be stated that the failure is due neither to the lack of properties of real value and merit (as witness the Mikado) nor to the lack of capital for working such properties (as witness the money spent on the Hammond Reef, the Regina, the Sirdar and others). To completely give the reasons why capital invested in this district has been unremunerative and why, in consequence, the section is held in disrepute by capitalists, is to write a long chapter. Over capitalization, and the greediness of promoters in realizing personal profits by selling their personal shares instead of treasury stock, are self evident factors in the case; but the most potent factor perhaps is one that is not recognized nor often mentioned in that section, and this factor is the complete lack of experienced or competent management of the properties that have been opened. There is a condition, common at present to all parts of the Dominion, which has also helped to keep back this section, and that is the unsatisfactory class of labor employed, and the remedy for this last trouble is one, perhaps, which only time can cure, but time is not needed to remedy the lack of competent management. It is the common remark of many of the first-class mining men, from other sections of Canada and from the United States, who have gone into the Western Ontario fields to examine on behalf of their clients or to seek investment for their own capital, that the management employed

in the mines that were working was almost without exception inexperienced in the work it had to do and therefore incompetent for the handling of such enterprises; and it is a well known fact that in low-grade gold countries only the best of management can expect to recover satisfactory dividends. From the REVIEW's own knowledge of many of the Lake of the Woods properties it is able to say that the investors who have found money for the enterprises undertaken have been most confiding and simple when they were satisfied to entrust the expenditure of their money to merchants, lawyers, grain dealers, speculators, British military gentlemen, or South African amateurs. In every case the efforts of these gentry have resulted in failures which have been only too fully advertised. The incongruous and amusing assortment of mining and milling equipment which can be seen in an ordinary trip through the mines is of itself most convincing evidence of the inexperience or ignorance of the management on these properties. In one place one sees the two stamp steam mill exalted into prominence, in another place one sees an ordinary contractor's donkey winch installed as a hoisting engine; again a forty stamp mill is erected to supersede a ten stamp mill, and the management of such a large plant is practically in the hands of a stone mason. Several miles of broad gauge track can be seen leading to a small ten stamp mill, and we are sure we are within the mark when we state that less than one thousand tons of *ore* have been hauled over that road. The indiscriminate use of diamond drills, the money sunk in coffer dams for speculative prospecting purposes, the attempt to transport ore, over 150 miles of an expensive public railway, to a stamp mill, and numberless other foolish undertakings are all plainly visible to the inquiring investor, and all disgust him and make of the Lake of the Woods a laughing stock.

Since 1895 there have been, possibly, half a dozen experienced or competent mining men temporarily placed in charge of properties in this section, but even of these men but few had the experience, or the peculiar qualifications, which are necessary for the successful working of low-grade free-milling gold ores. The mining of iron ores, or of phosphates, or of precious metal *smelting* ores does not give the experience and the knowledge required to successfully handle the ores we have just described. Not the least important part of such management is the successful reduction of the values contained in the ores to marketable hullion, and the number of capable amalgamators, or of men having anything like an adequate knowledge of the metallurgy of gold, which this district has seen can easily be counted upon the fingers of one hand. It is within the knowledge of the REVIEW that not so very long ago the district was examined pretty thoroughly by a party of engineers from the south of the line, and that a generally favorable impression of the possibilities of the district was received, but the concluding remark of the chief of the party was, that he had seen no mill in Western Ontario from which he could not have saved a satisfactory salary by the simple expedient of putting in charge one of his own trained men.

Although we refer more at length in another part of this issue to the Central Canada Chamber of Mines, we may say here that this agency has not been without its adverse effect upon the gold fields. Our reasons are stated elsewhere, but it may be sufficient to say that a Chamber of Mines must base its opinions upon the actual bullion returns from well managed mines in its section, and that no district will be judged by the publication of an average of a thousand assays, or of many thousand assays of odd lots and rich samples brought into an assay office. To our regret we must also say that the broad gauge advertising methods of our contemporaries in that section, and the paragraphic puffs of prospects and men which are freely inserted, do not combine to impress people who have the money, the factor which is so earnestly desired by operators in that section. The public press is often considered as the Archimedian lever which moves the world, and not without cause, but it should be evident to the press of the Western Ontario fields that the publication and dissemination of unverified rumors, of highly coloured stories brought in by interested prospectors, and of golden editorials, will not bring in good management, nor capital, and will not assist the country, but will rather help to its damnation.

Mine Examinations.

The discussions which have been going the rounds of the mining press in America during the past few months, touching the duties of an engineer in the examination of mines, are evidence of an awakening on this important matter. We have previously discussed the same subject, and have endeavored to show what questions should be answered in a report upon a mine examination. One of the most serious defects in such documents is a lack of sufficient internal evidence of accuracy. The main thing needed is an abundance of facts, stated clearly and in great detail. Opinions are of very small consequence unless the engineer shows how, and in the face of what *data*, he arrived at them. It matters not how great may be the reputation of the engineer. He should not ask us to take his verdict without offering proof that he is correct. If the conclusions reached are defensible, they should depend upon a train of reasoning on observed facts and conditions, which when presented to another engineer should lead him to confirm the judgment given.

Neither is it enough to state the facts. We should know how they were obtained, and there are many terms which should be defined in order that we may know just what the engineer means. There is much difference, for example, in the meaning assigned by various engineers to the expression "ore in sight." Ore is not safely in sight until three sides are exposed to view for sampling, but where two sides only are revealed a triangular body may be assumed. Where only one side is shown, as where a drift extends for some distance on the vein, with no winzes or shafts giving a vertical exposure, the ore may properly be reported as indicated only.

Another serious defect in methods of examination is that, from lack of time, the engineer does not usually become thoroughly acquainted with the peculiarities of the ore deposit. By inspection he judges as to its variation in character, and by inflexible rule he endeavors to obtain an average, taking samples at regular intervals. In the case of ores of very uniform character this will do well enough, but uniformity is not the rule, and so this uniformity of sampling will not fit the conditions. The first essential for arriving at a safe judgment as to how the sample is to be taken is to become acquainted with every feature of the deposit. This can come by, first, making a careful mineralogical examination of the ore at a very large number of points in the mine, and, second, by making trial assays of the ore taken from a still greater number of points, representing all distinct bands or seams, ore adjacent to walls, and of selected pieces of apparently rich ore and of seemingly barren gangue. The possibility of sorting good from bad ore must be kept constantly in view, and efforts should be made to determine the proportions of each. Average values of ore in a vein may easily be misleading, and even mischievous. In fact, averages are difficult to reach unless the ore is very uniform in metalliferous contents throughout. It is evident that the conscientious engineer has a serious study before him when he undertakes to report on a mine, and that he must perform much preliminary work before he can even begin to take samples for final assay. To do his duty he needs an assay office at his command, and he will have work enough to keep an assayer constantly busy while he is making his examination. There are few cases in which an engineer is competent to intelligently sample a deposit until this exhaustive preliminary study has been made. We

insist on this because we believe that many failures following a commendatory report have been due to the existence of peculiarities and irregularities in the ore concerning which the engineer was totally ignorant, and which have upset all his calculations when practical operations were begun.

It is no doubt true that many failures have occurred from incompetent management in the mining and subsequent treatment of the ore, which should reflect no discredit upon the examining engineer. But this indicates another duty which the reporting engineer should not shirk. He should clearly point out what methods should be pursued, not in general only, but in as full detail as if he were laying plans for operating the property himself. This of course is a measure of safety for guarding his own reputation, but it is also a thing which the parties to whom he reports should obtain from him and pay for. The work of an engineer on a property which is sufficiently developed to be put on a productive basis is not completed until these problems have been fully determined.

Finally it must be iusisted upon that no engineer who takes any interest in any mining property, outside of his fees for engineering services rendered, is a safe man to trust in the delicate matter of reporting for investment. He may be ever so honest, able, and sincere, but it is human nature to look less dispassionately upon that in which we have a pecuniary interest than upon what belongs wholly to others. The ablest engineer in the world will fall into error in reporting on a mine unless he can approach his task in a perfectly cold-blooded judicial attitude.

The Montreal-London Gold and Silver Development Company, Limited.

The report of the annual meeeting of the Montreal-London Gold and Silver Development Company, Limited, as published in the Montreal press, affords legitimate opportunity for criticism of this company, which has now been before the public for more than three years. An excuse, if any excuse were needed, for dwelling upon its present depressed condition is found in the blind mismanagement of its directors, and in the depressing effect this mismanagement has had on investment in our most eastern province.

The Company, as first projected, was intended for the London market, (as witness the shilling shares) but when London proved inhospitable its promoter, whose previous knowledge and experience had been entirely confined to booming real estate, brought it back to Montreal where he was successful in obtaining the co-operation of some of the solid business men. The property had been examined by several mining men of greater or less prominence, experience, and ability, and by all it had been deemed valuable, and capable of yielding very profitable returns if *properly and economically managed.* Prominence was given to this fact by the president of the company in his apologetic speech to the shareholders at the recent annual meeting.

The promotion went with a rush, and the company found itself in possession of ample funds for the development and equipment of this mine, and for the other purposes for which the company was formed, which (succintly) were those of a development, or parent, corporation.

Under the skilful manipulation of its promoter and the rush of "boom" times the "Development" portion of the capital earned very satisfactory dividends; the stock attained a market value, for a time, of about 400 p.c. and for a long period was dealt in at 200 p.c. or over, but with the collapse of the mining share boom came the cessation of dividends earned (?) by the Development end, and the dependence of the company upon the actual working of the Dufferin mine, whose equipment and development had been proceeding for two years. Under the direction of the company's engineer, whose ability as a mine *examiner* is, and has been, unquestioned, but whose previous record as a mine *manager* had been costly to the Montana properties concerned, the equipment of the property was proceeded with, and at an expense of over $200,000 the property was equipped with a 30-stamp mill, new shaft house and surface buildings, including a machine shop, two new hoisting plants, two air compressors of large capacity, together with an electric lighting plant, and the other accessories of a well equipped plant. At the same time provision for operating this machinery by means of *steam* was made by the installation of seven large boilers in two nests; one of five, for the mine machinery, and one of two boilers for the large 250 h.p. tandem mill engine.

At this point the enginneer and his Board made their first mistake. The property was equipped with a most unnecessary and expensive plant, consuming enormous quantities of fuel for very low power effects, while the magnificent water power of the Salmon River only half a mile away was permitted to go to waste. Briefly speaking, an expenditure of fifteen tons of coal per day for power purposes was required when at least six hundred horse power in falling water was disregarded. The cost of the machinery plant above described, installed and set up was in excess of the amount of money which would have been required to have conserved these water powers, converted the power into electricity, and have conveyed it to the mine to have been used for the various operations of hoisting, compressing and pumping for which power is usually required at a mine. The installation of an electric plant to use this water power might have taken a longer time than did the installation of the steam power, and progress might not have been so rapid as it was by the use of steam. At the same time all the shareholders may not be acquainted with the fact that to run this steam plant to its capacity under ordinary circumstances requires the burning of 15 tons of coal per diem which coal, delivered on the grates of the boilers, costs no less than $5.00 per ton. With a mine running 312 days in the year it will be seen that the cost for fuel in one year would closely approximate the figure of $25,000, but the chairman, in his speech at the last annual meeting (January 8th), made the statement that by using water power instead of steam an annual saving of $35,000, or $3,000 a month would be effected. The point we wish to make here is, that this matter of the relative cost of water power *versus* steam could have been, and *should* have been, determined by the engineer and his board of directors, if they were worthy of the name, before any expenditure had been incurred for a steam plant. If it is apparent in the year 1901, more than three years after this plant was installed, that the cost of its operation is thousands of dollars a month more than the cost of water power, one can reasonably say that the directors, by failing to check up their manager, are responsible to the shareholders for a loss of over $100,000, which might have been saved to the company's treasury had electricity been installed at the beginning

During the two years (1898 and 1899) the public understood from inspired paragraphs in newspapers, and from statements made by officers at the annual meetings, that vigorous development of the mine was going on, and that ore was so abundant that 30 additional stamps were required; they were erected and completed before the annual meeting in January, 1900. In the meantime the company had succeeded, in the middle of the year 1899, in getting a mine manager whose efforts were certainly in the direction of decreased costs and general economy. But by this time treasury funds were low and there was no money to carry out the recommendations of the mine manager. Worse yet, this manager had to report that there was

no sufficient body of ore in sight to keep the large mill running, although the treasury funds of the company had been administered with an open and unheeding hand for two years *supposedly* in the development of large ore reserves.

About this time (January 1900) it was understood that the directors had sent a prominent Canadian authority on mine and mill management to the mine to make a full report upon the property and the administration; but if this was done the shareholders, so far as we have been able to learn, have never received that report nor has any reference been made to it by the company.

Immediately thereafter, or about April 1st, the management capped the climax by giving, without forfeit or consideration, an option on the entire property to an unknown and unvouched adventurer, who appears, by the last annual statement, a debtor to the company to the extent of $4,000. Associated as expert with the optionee was a mining man, who now is the company's manager at the mine. Under this gentleman's direction a test of 30 days duration was made. The result of this month's test was not particularly encouraging, but it sufficed to close the option, and after a short time the optionee advised the company that he did not care to go on with the option but would surrender it at once to the company. The condition of the company may be judged when it is understood (as we are informed) that the military optionee was begged to retain the option and not make public his refusal of it until "the market was in better shape."

After expending, as per the last annual statement of this company, over $460,000 (of which about $80,000 we are informed were paid for purchase of the property) the company has found itself in a bad financial way, and in the beginning of the year 1901 appeals to the public for new money to the extent of $150,000 to enable it to go forward. The confiding shareholder has been invited (and we believe will respond to the invitation) to contribute about 30 per cent. of his present allotment to the new issue of preferred stock.

We regret, not only for the sake of Nova Scotia, but also for the sake of the shareholders and the interests of good mining generally, that this property has been so mishandled. We are not interested in the shares nor in their present price (now very low), but we are interested in the fact that one of the best properties in Eastern Canada is being condemned although an expert of the Geological Survey of Canada and other disinterested, competent engineers have agreed in considering it one of the best gold properties in the East: The property has had an abundance of capital for a thorough and proper development and quite sufficient to have put it permanently upon the list of dividend paying Canadian mines, but this capital has been squandered, or badly expended, and the company is not likely to raise in the open market the sum required to *undo what has been done* and to do what should have been done. The trouble with the Dufferin mine is not *chiefly* with its tailings, and the installation of a cyanide plant under present conditions will not convert its losses into profits.

What the Dufferin wants, and what the shareholders should see that it gets, is honest, competent, energetic and experienced management: useless expenditure should cease, and extravagant or dilletante engineering should be declined. Competent advice can be secured if the directors choose to pay for it, and, although the Dufferin's days as a "boom stock" are over, its capacity to pay dividends when properly handled is, we are confident, as great as ever.

The Central Canada Chamber of Mines, an organisation largely composed of Winnipeg merchants, continues to make itself ridiculous by the absurd character of its literature. A recent publication by it states that the Dominion Government reports "that there are 10,000 men now at work within this area (the Lake of the Woods) as against about 2,000 a year ago." The Dominion Government never made any such statement. The total labour employed by Ontario mines in 1899 was 10,003 persons and the labour in gold mining (including by the way important industries in Hastings County) 611 persons.

Improvements in Hydraulic Classification.

There seems to exist a popular misconception of the function of hydraulic classifiers as an aid to concentration, which leads to a misuse of these important appliances, and thus in consequence causes many millmen to discredit them. We constantly hear them spoken of as hydraulic sizers. Now, this is a misnomer, and it often happens that to call a thing by a wrong name is to expect of it something it cannot perform. It is manifestly improper to call this kind of sorting a sizing. In no sense does it accomplish the work of a screen. If it did, it would be a very poor substitute from every point of view for true sizing appliances. It requires too much vertical height in a mill, and it has the further disadvantage of adding very considerable quantities of water to the pulp. Both of these disadvantages are serious, the latter perhaps the worst. There are few cases in which it is not inconvenient, for future treatment of the pulp, to increase its dilution. If the purposes of the millman can be subserved by sizing, then by all means use trommels or screens.

The hydraulic classifier is in effect a concentrator. It will not replace ordinary concentrators, for it will not, save under exceptional conditions, which are rarely economic, produce clean heads and tailings, but it effects enrichment, robbing the slimes finally of valuable mineral, thus obviating one cause of excessive losses in concentration. But it does more than this. It divides the fine sands into grades from which the valuable minerals may be more readily and accurately separated by other concentrators. This is accomplished by adjusting the rising water current in the classifier so that the smallest grain of heavy mineral in the grade issuing from the spigot of one compartment will settle at the same rate as a grain of gangue equal in diameter to the largest grain of heavy mineral in the same grade. The result will be that the grade issuing from the first spigot will be considerably richer than would have been the case had a screen been used for sizing between these two extremes of diametral sizes. The succeeding spigot discharges will be still more highly enriched, and the overflow (commonly designated as "slimes") will contain a relatively large proportion of gangue, with particles whose diameters will range from a size considerably greater than the smallest ore particles in the last spigot discharge, down to the finest pulp. The main advantage in concentration resulting from the use of classified sands consists in the fact that, though the largest gangue grains in the graded pulp will ultimately fall in water with a velocity the same as that of the smallest ore grains, the initial velocity of the ore grains will be less, owing to the less resistance due to their smaller size. Where the concentration is effected on contact-surface concentrators, such as vanners, buddles, riffle washers, etc., instead of in jigs, friction of the particles against the surface of the machine comes into play, and theoretically the friction of the equal-settling particles is the same, but the water currents exerting a greater force against the larger gangue grains move these more readily, thus causing them to separate as tailings, along with the smaller sizes of gangue which are more easily swept down by the currents. From the foregoing it will appear that a very accurate adjustment of the rising current in the several compartments of a hydraulic classifier is essential to produce beneficial results. This can be calculated by the ordinary Rittinger formulæ, or the same result can be reached by testing the overflow from each compartment by screens of proper size, if the limiting diameters for gangue or ore grains in any particular case are known to the millman. In any event it is not possible to attain really accurate results, which will be in the highest degree economical, by mere rule-of-thumb. Unless the millman possesses the requisite knowledge to handle these delicate appliances properly, he is almost certain not merely to use them at a dis-

advantage, but even to seriously prejudice his whole scheme of concentration by employing them. Rather than use hydraulic classifiers ignorantly, it is wiser to resort to screens and size the pulp, crude and unscientific though this method is.

Coming now to the relative merits of different forms of hydraulic classifiers, we find two prime defects inherent in the operation of nearly every form in the market. There are many patented designs, most of which are in no wise superior to the two best known models which can be made by any carpenter or machinist. The old Engis trough separator, practically the same as the Lake Superior trough washer, and the familiar inlet-discharge separator, are both fairly efficient, and are the types upon which most classifiers sold by makers of mining machinery are based, and in most instances the modifications serve only to catch the unwary, without offering any advantages over their prototypes. In these the principal defect is the existence, due to the jet of rising feed water, of a parabolic curve of equal pressure. The effect of this is to set up a circulation of grains that should be discharged with the overflow, the accumulation of these grains inducing the formation of banks that finally close together and clog the appliance unless a more powerful current is used than that theoretically required.

A superior form of classifier is that in which the separation occurs in a vertical tube through which a rising currents meets and sorts the downward falling pulp. The parabolic curve of equal pressure is here entirely overcome, but in its place are set up elliptical currents which seriously disturb the action, and produce inaccurate gradation of the spigot sands. The most important improvement in hydraulic classifiers made in recent years is that introduced by Prof. Robert H. Richards of the Massachusetts Institute of Technology, in which the irregular currents in the vertical tube classifier are broken up completely by the addition of feed water through curved channels in the walls of the separating cylinder, giving a rotary motion to the column of water in this cylinder, while at the same time it is moving as a mass in an upward direction. Immediately above and below this separating cylinder are vanes projecting radially from the walls of the tubes carrying respectively the overflow upward and the classified product, or spigot sands, downward. The vanes break up the rotary motion, above and below the separating cylinder, facilitating the even discharge of the two products. The results of elaborate tests with this appliance show an exceedingly accurate classification of sands, with very large capacity, and relatively small dilution of the pulp.

Another ingenious contrivance of Prof. Richards has apparently solved the vexed problem of classifying accurately the exceedingly fine pulp which issues as an overflow from ordinary classifiers. This consists of a long deep box, with a false bottom midway between the top and bottom of the box, perforated with a large number of round holes. Fresh feed water is added below the false-bottom, causing a slowly rising current through the perforations. The pulp is fed at one end of the box, and flows across the false-bottom, the heavier particles settling through the holes, whence they are discharged through spigots below. This device is excessively simple, and its results are said to be very remarkable. It requires but very little height, and the feed water added to the overflow is quite inconsiderable.

Canadian mining managers and mining engineers who are not already members of The Canadian Mining Institute are cordially invited to the annual meetings on 6th, 7th and 8th March next. They will be carried to and from Montreal for a single fare on the Canadian Pacific, Grand Trunk, Intercolonial, Quebec Central, and Canada Atlantic Railways on obtaining Convention Certificates from their ticket agents.

Geology "As She is Wrote."

The "Central Canada Chamber of Mines" has followed a well beaten track in its various efforts to attract attention from the public, but it is doubtful whether the Chamber is conscious of the amusement which some of its efforts have provided.

The Manitoba *Free Press* has furnished the medium by which many of the brilliant ideas emanating from the Chamber have first been introduced to the public, for which we sincerely hope the *Free Press* charged full advertising rates.

Some of these emanations have been reprinted by the Central Canada Chamber of Mines, and sent out broadcast; two have fluttered to our table, and they are remarkable specimens not only of choice and classic English prose, but of scientific learning and deep research.

We regret that we have not space to note at length the article on "Water Powers of Central Canada," which contains many remarkable statements, but the article on the "Geological Characteristics of the New Gold Fields of Central Canada" contains so many new and startling geological facts that we must note a few of them for the benefit of our readers. We also fancy that the staff of our Geological Survey will at once proceed to cast away all the information they now possess, and will make a fresh start from earliest principles.

The opening paragraph of this unique article is not only a model of clear and concise statement, but propounds a new theory:—"The "quartz and schists of these new gold fields are of extremely ancient "geological formation, being found *embedded in true fissure veins of* "*the Laurentian rocks of the 'Eozoon Canadense'* and are, *therefore*, "embedded much deeper in the bowels of the earth than any other "known gold field." What! oh what will Drs. G. M. Dawson, A. C. Lawson and W. McInnes say to this fundamental truth? For the first time (to our knowledge) we learn that the micaceous, hornblendic and felsitic schists of the region are "found embedded in true fissure veins," and that the Laurentian rocks are of the "Eozoon Canadense." After fully grasping this potent fact the reasons for the non productiveness of these gold fields is immediately clear,—all the *miners* in that region have been looking for auriferous *quartz*, let them cease at once and look for "true fissure veins" of *schist*, in "Laurentian rocks of the 'Eozoon Canadense'"; any other Laurentian rocks than those of the Eozoon Canadense will not do; and then, when found, we shall have plenty of gold.

Another one of our cherished ideas is shattered in this article. We had always been under the impression that these gold bearing deposits were somewhat restricted in horizontal dimensions, but we have been mistaken, for this writer tells us that they are "miles long and exceptionally wide, with numerous large gash veins intersecting at intervals." But where the public have been most fooled is in the average value of these "reefs," which the learned author states is $11 per ton. Shades of the Homestake! Miles long, exceptionally wide and worth $11 a ton! We are now firmly convinced that Canada can sell gold for the same price as brass, and at a great profit, for these articles are endorsed by the Central Canada Chamber of Mines, and therefore *must* be correct.

But our dynamic geology is also at fault, for in the very lucid paragraph relating to the origin of these fields, we learn that the "igneous rocks" "owing to greater contraction in cooling—have been drawn away from the harder granites leaving the extensive fissures open to the molten matter, through which flowed the auriferous quartz, schists, and traps."

To our mind no geological picture can beat these words of "Africandencia"; we can shut our eyes and see the "igneous" rocks

" drawing away " from the cold, cold granites; the yawning fissures are opened, when suddenly, all jumbled up together, melted auriferous quartz, schistose rocks, and amorphous traps spout from the fissure and overflow " into extensive valleys forming immense *overflows or dykes*, such as the Scramble and Hammond Reef " mines.

These are but a few of the pearls of originality contained in this article, but we must not close our notice without reference to the paragraph in which conclusions are finally reached, thus—" The reefs " opened out are certainly not surface float or drift " (the logic of this is unassailable) " or deposited in solution, neither is it reasonable to " suppose they fell from the clouds " (we agree fully, it is *not* reasonable), " they clearly came from below and are *therefore* unquestionably " fissure veins in the true geological sense." Let us point out, for the benefit of young and unknown engineers, that the last paragraph is an easy answer to that often vexatious question—What is a fissure vein ? If your vein is not float or drift, or " deposited in solution," or has not dropped from the clouds it must have come from below and " *therefore* " must be a " fissure vein in the true sense."

We are suspicious that the Central Canada Chamber of Mines has been asking money grants from the Ontario and Dominion Governments for the secret purpose of providing confined lodgings for its promoter and secretary.

The London and Globe Smash.

The closing days of the last century will be memorable for the collapse of the London and Globe Finance Corporation, an enterprise in which Canada is to some extent concerned inasmuch as it is the parent corporation and promoter of the British America Corporation, the Le Roi Mining Co., Columbia and Kootenay, Great Western Mines, and other subsidiary ventures operating mines in the Rossland district, British Columbia, This failure of the " Whitaker-Wright " group, so called because they owe their existence to a gentleman of that name who has become famous for the greatness of the scale on which he has engaged in the business of floating mining and financial undertakings of various kinds, is ripe in its lessons for the British investing classes as to the vanity and hollowness of much of our later day high financing in joint stock company affairs.

A brief review of the history of this undertaking will not be without interest to our readers. In 1895 the London and Globe Finance Corporation (Limited) was formed with a capital of £200,000, of which £5,000 was in so-called deferred or founders' shares, of 1s. each, entitled to half the net profits after paying 10 per cent on the ordinary £1 shares, and providing for a reserve fund. It was to engage in promoting companies and other financial business. Its directorate, management and all the rest of it were practically identical with those of the West Australian Exploring and Finance Company, which was engaged in the same line of business, so that the two concerns were at once rivals and brothers. This position could not be long maintained, and, as happened in similar circumstances with the " Bottomley " finance companies, they were, in 1897, amalgamated, the title of the London and Globe Finance Corporation being retained. The capital was at one stroke increased to £2,000,000 in shares of £1 each. Then commenced a long series of more or less ambitious mining and other promotions, the first venture being the British American Corporation (Limited), registered in October, 1897, with a capital of £1,500,000, which was also to engage in the promotion business in British Columbia. This was followed by nine other undertakings, purely mining, three being launched in 1898 with an aggregate capital of £1,871,214; two in 1899 with £1,450,000, and four in the past year with a combined capital of £2,250,000, which brought up the total to the magnificent sum of almost £19,000,000, the great bulk of which went to the vendors.

So long as the London and Globe Finance Corporation confined itself to floating new ventures—whatever their real intrinsic worth—it presented an appearance of prosperity. For the first eighteen months of its career in its new shape it paid a dividend of 15 per cent. and for the year ended the 30th September, 1899, 10 per cent. These distributions absorbed £500,000. On the other hand, it had to write off an exactly equivalent amount for depreciation of securities during the same interval, after performing which operation its share investments stood on the books at £1,813,231. But for the year ended the 5th December, to which the last accounts were made up, there was no dividend, and a round million sterling more had to be written off for losses on investments After allowing for this extensive scaling down operation, the shareholdings in sundry companies, apart from £621,430 in the Baker Street and Waterloo Railway Company. figured for £2,332,632, so that the company must have added enormously to its interests in other ventures during the year. What may be their exact nature cannot be said for certain, because the directors have been careful not to publish a list of the securities held; but from the character of the business it has been engaged in during the last few months in the London Stock Exchange it is safe to assume that the whole, or practically the whole, of the shares are those of the several companies it has floated. Again, it would be impossible to say at what prices those shares were acquired; yet we may further assnme that as to a large proportion of them, they were bought at considerable premiums. Take, for example, the case of the Le Roi No. 2 Company, which was issued as recently as June last with a capital of £600,000 in shares of £5 each. These were not long since " rigged " up in the market to about £28 each in order to " corner " the " bears." In the process of carrying out this operation the Corporation must have become possessed of a considerable number at steadily increasing quotations. On 28th December they stood in the market at £23, and on the following day they were nominally quoted at £1 to £3—that is to say, at a clear drop of over £20 per share. The " shop " has the shares, and if it wanted to sell them it would have to accept about four or five shillings in the pound for them on the nominal price, and about a shilling in the pound on what may have been paid for the shares while they were being " rigged " in the market. The shares of the Kootenay Mining Company, which was floated in July last with a capital of £400,000 in shares of £1 each, were worked up in the same fashion to between £8 and £9. On 28th December they stood at £6, and on the following day they were down to £1, 10s. The shares of the British American Corporation, formed in 1897 with £1,500,000 of capital, stood not long since at 30s., and are now at 10s. each, and those of the Le Roi Company with a capital of £1,000,000 in £5 shares, which stood at £9, are now back to within a small fraction of their par value. Standard Exploration shares are down to about 3s., and the shares of some of the other companies in which the Corporation is interested have no quotation whatever.

Now, in the bolstering up of the market implied by the immense premiums to which the shares of the several companies just enumerated were driven, the London and Globe Finance Corporation has taken the leading part. A grand " coup " was arranged for the final settlement of the year. Huge blocks of shares were bought, and it was ostentatiously bruited about that they would be paid for and taken off the market, whereby the " bears " would be once more severely punished. But the Corporation, uot having the needful money, and the financial houses and banks which had agreed, provisionally, to furnish it, becoming at the last moment distrustful of the business, drew back, so that being thus stranded, the Corporation instead of paying for the

shares, became a defaulter. It is said in the market that it was under engagement to take up shares to the extent of between £600,000 and £700,000, and that its "differences" amount to a further sum of about £400,000. The suspension is said to have fallen upon the London Stock Exchange as a "bolt from the blue," though by those who have watched the game from the outside and bore in mind the collapse of the "Bottomley group," which owed its ruin to the pursuit of an exactly similar class of stock-jobbing enterprise, the incident was fully anticipated.

The question everybody concerned is now asking is: How is the affair going to work out? The Corporation naturally hopes to meet all its engagements in time. In the case of the "Bottomley" breakdown there took place a great shuffling of the cards, the outcome of which was a consolidation of the several companies involved, the calling up of fresh capital, and the creation of debentures and preference shares, which were accepted in part payment by the creditors. As regards the London and Globe Finance Corporation failure there is nothing to consolidate, but much to reconstruct. It must have assets ample enough an more to meet its liabilities, if judiciously nursed and disposed of. As to the moral of this business, it is clear enough—so clear, indeed, that to dwell upon it must be felt to be quite superfluous. But it is by no means as clear that the moral will avail much to warn investors against participating in these ricketty gambling ventures whose main attraction seems to be the eminence of the people who undertake to guide their destinies.

Query: When was Whitaker Wright? When he took a Duffer(in). —London *World.*

Mining in Nova Scotia, 1900.

Coal mining has shown good progress in Nova Scotia during the past year. The sales amounted to 2,995,000 tons as compared with 2,637,937 tons in 1899. This increase was shared in by all the districts. The most notable shipments were 624,500 tons to the United States, the largest previous shipments to this market being 465,194 tons in 1865.

The practical completion of the furnaces and coke ovens of the Dominion Iron and Steel Company at Sydney mean a largely extended consumption of coal during the year 1900. The coke made here has proved equal to Connelsville.

The Nova Scotia Steel Co. has acquired the holdings of the General Mining Association, well known as the Old Sydney Mines, and are building coke ovens of the most approved pattern, to supply coke for their furnace in Pictou County and also as part of a proposed large steel works.

The Dominion Coal Company has three new collieries under development which will materially increase their output. They have also completed a large Robins belt conveyor at Louisburg which will load from pockets and very greatly increase their shipping facilities. On the western side of the island extensive developments are in progress in the Port Hood and Broad Cove coal districts, which are most favorably situated for the coal trade of the Gulf of St. Lawrence. In Pictou County the usual conditions of steady work have prevailed, the only new work being the preparations of the Nova Scotia Steel Co. to open a seam on one of their coal areas said to be specially suitable for use in convertors.

In Cumberland County the Springhill Collieries have continued the exploration of the extension of their seams, and have increased the underground development until they are able for some years to come to meet any requirements of the trade. The Joggins mines have also improved their equipment and capacity.

The gold mines have as a rule not shown any marked increase of activity, the output being 31,110 ounces against 27,772 ounces during the preceding year. The Libbey, Richardson and other established mines continued to work steadily, but few new districts came to the front. As about 65,000 tons were crushed the average yield was in the vicinity of one-half ounce to the ton. At Harrigan Cove 1813 tons yielded 1,705 ounces; and 212 tons from Renfrew yielded 3,403 ounces. The stability and value of mines working medium grade ores was again demonstrated in the Stormont, Brookfield, Sherbrooke and other districts.

The production of iron ore was small, being confined to about 16,000 tons from the Nova Scotia Steel Co's mines at Bridgeville. This company also imported about 30,000 tons from Newfoundland, and made about 25,500 tons of pig at Ferrona. The Dominion Iron and Steel Company rely entirely upon their Newfoundland ore, and imported it is said about 100,000 tons. During the year the services of a Government drill were secured by parties interested in the Torbrook district, Annapolis County. These parties traced several valuable beds of red hematite from 2 to 12 feet in thickness for a distance of about five miles. Several holes have been put down and the ore proved to continue to depths of from 300 to 500 feet. The work has shown the presence of many millions of tons ore of good quality.

At Arisaig, in Antigonish County, and at Whycocomagh, in Inverness County, a good deal of work was done, adding materially to the proved extent of the numerous deposits known thete.

The Copper Crown Company completed their copper furnace at Pictou, but experience has led them to make alterations to increase its efficiency. During the season a few hundred tons of ore were taken from their Colchester and Cumberland mines. The Polsons Lake and the Lochaber deposits, in Antigonish County, received some attention. At Cape d'Or, in Cumberland County, a shaft is being sunk in the trap to cut a layer of ash reported to carry considerable copper values.

The Barytes mine at Cape Rouge, Inverness County, yielded 783 tons of mineral.

Incomplete returns show that about 1,150 tons infusorial earth were treated, chiefly by the St. Ann's, and by the Bass River Silica Companies.

In addition to the usual quantities used locally, the Nova Scotia Steel Co. quarried 24,300 tons of limestone, and the Dominion Iron and Steel Co. used a large quantity for concrete work taken from their Georges River Quarry, probably about 75,000 tons. In addition large quantities are being quarried at that place and at Marble Mountain, West Bay, for the company's furnaces.

Gypsum returns so far show that the year's production was slightly behind last season's, due largely to the non-working of the quarries in the Baddeck District. It is expected that these quarries will resume work next year, and that the production will rise from 122,281 tons to its normal figures of about 150,000 tons. In addition to the shipments of this mineral, considerable quantities are manufactured for local use, ground for house work and used in the manufacture of fertilizers. A few tons only of manganese were shipped, although it is believed that deposits of considerable value exist in the New Ross district.

Unusual activity prevailed in the brick yards and quarries, and the demand, in the case of the former, was continually in excess of the production. Deposits of valuable clay in the Musquodoboit Valley suitable for firebrick and the finer grades of pottery are being tested and proved.

Mining in Quebec, 1900.

The mineral industry of the Province of Quebec comprising important operations in the production of asbestos, copper pyrites, chromite, iron, mica, graphite and other minerals, has had a satisfactory year, and while the mines are not listed on the stock exchanges, nor have they had that prominence in the press which has characterized less stable enterprises in other sections of the Dominion, the industry, as a whole, is on a sound footing and may be said to have yielded profitable returns to the operators.

We are indebted to the courtesy of Mr. J. Obalski, M.E., Inspector of Mines for the Province, for particulars of the development of these industries during the year from which these notes are compiled :—

IRON INDUSTRY.

The remarkable expansion of the iron and steel industries of the Dominion and the great interest which has been excited in this industry, has not been without effect in Quebec. The blast furnaces of the Canada Iron Furnace Co. at Radnor Forges, and the McDougall plant at Drummondville, have been actively operated, the output of the latter furnace having increased to something like 35 tons of pig per day. The charcoal pig iron manufactured by these companies from the bog iron iron ores of the Province is well known to be of a very superior quality and in spite of its high price it commands a ready sale in American and European markets. Shipments of magnetite to Pennsylvania were also made regularly during the summer months from the Scott Mine near Hull, in the County of Ottawa. Considerable interest too was taken in the deposits of magnetic sand located on the north shore of the St. Lawrence River as a likely source in the near future of supplying the large furnace plant being erected at Sydney, Cape Breton, for the Dominion Iron and Steel Co. After a careful investigation I am convinced of the great extent of these deposits and with proper metallurgical treatment they will doubtless be successfully exploited in the near future.

CHROMITE.

The mining of chromite in the Eastern Townships has been conducted on much the same lines as former years. The mill of the Coleraine Mining Company continues to yield a concentrate of about 50 p.c. which finds a ready market. Ore has also been shipped from the Black Lake mines to the electrical reduction works at Buckingham for the manufacture of ferro-chrome. A new deposit of some note has been opened on lot 17 in Range A of Coleraine by Messrs. Joseph Nadeau & Co.

OCHRE.

This mineral is mined and prepared at St. Malo, near Three Rivers by two companies. The Canada Paint Company, one of the operators, also utilizes the sulphate of baryta taken from lot 7 in 10th Range of Hull.

COPPER PYRITES.

The ores of the Eastern Townships continue as in the past to be exploited mainly by the Eustis Mining Company at Eustis, and the Nichols Chemical Company at Capelton. The extensive operations of these companies are well known. Some prospecting has been carried on during the year in the vicinity of Sherbrooke, particularly on the Suffield and Sherbrooke properties and also at Ascot where some work has been done by an American company. Dr. Reed has also taken out some rich bornite from the old Harvey Hill workings.

ASBESTOS.

The principal mining industry in the Province, and one of the most important in Canada, continues to be the production of asbestos from the celebrated mines at Thetford and Black Lake. A strong market and good prices have greatly stimulated activity in these districts and at date over 1,000 persons are employed. New milling plants are being erected by the Johnson's Company at Thetford and Black Lake. The Beaver Asbestos Company has reopened its mine at Thetford and under the management of Mr. Harry Williams is now installing an up-to-date asbestos plant. It is understood that Mr. R. H. Martin, of the H. W. Johns Manufacturing Company, New York, having acquired the interests of a number of the members of the old corporation is the principal spirit in this enterprise. The well known mines of King Bros. under the management of Mr. Bennett, and the large works so energetically managed by Mr. George R. Smith, M.L.A., are also being extensively operated. A view into the dark cavernous pits, now formed into one colossal opening in the Bell Company's workings, through the removal of their separating walls is extremely picturesque. The pits vary from 100 to 150 feet in depth and the cliffs frowning above them are sprinkled with derricks along whose steel cables as they descend into the pits run the swaying carriages bringing up their cradles of stone which are dumped into waiting cars and carried to the separaters, crushers and dump. The scene on the floor of the pit is full of action and gangs of workmen at various points are blasting, drilling or prying open the ledges and exposing new surfaces of the serpentine.

In the Black Lake district Dr. Reed has reopened his mine and is contemplating the erection of a mill; the Union Mine under Mr. Crabtree is regularly worked, while the old workings and plant of the Glasgow and Montreal Company have been taken over and are operated by the Canadian Asbestos Company. At Danville the operations of the Asbestos and Asbestic Company, Limited, have been greatly hampered and reduced by the destruction of their fine mill by fire. A temporary plant has been installed and a new one of large dimensions is spoken of. Small quantities of this mineral were also shipped from Ottawa County. Altogether, the asbestos industry may be said to be in a most flourishing condition and will compare most favorably in importance with any other mining industry in the Dominion.

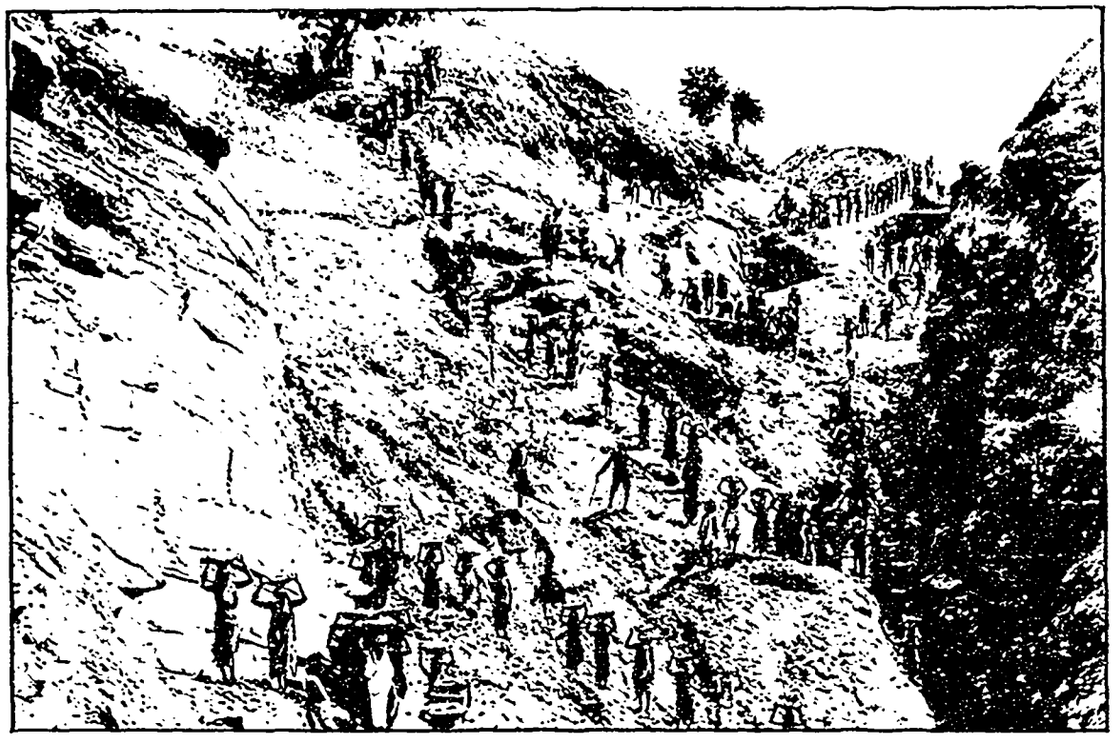
GRAPHITE.

Notwithstanding a strong market the production of graphite has been disappointing, the only plant in active operation in Quebec being that of the American Graphite Co., near Buckingham, operated by an American syndicate. In the vicinity of Calumet, County of Argenteuil, a new enterprise, the Keystone Graphite Company, has been mining a deposit of high grade mineral the output being shipped to the United States where good prices have been realised. The Walker Mining Company's mill, owing to internal troubles among the owners, still remains idle.

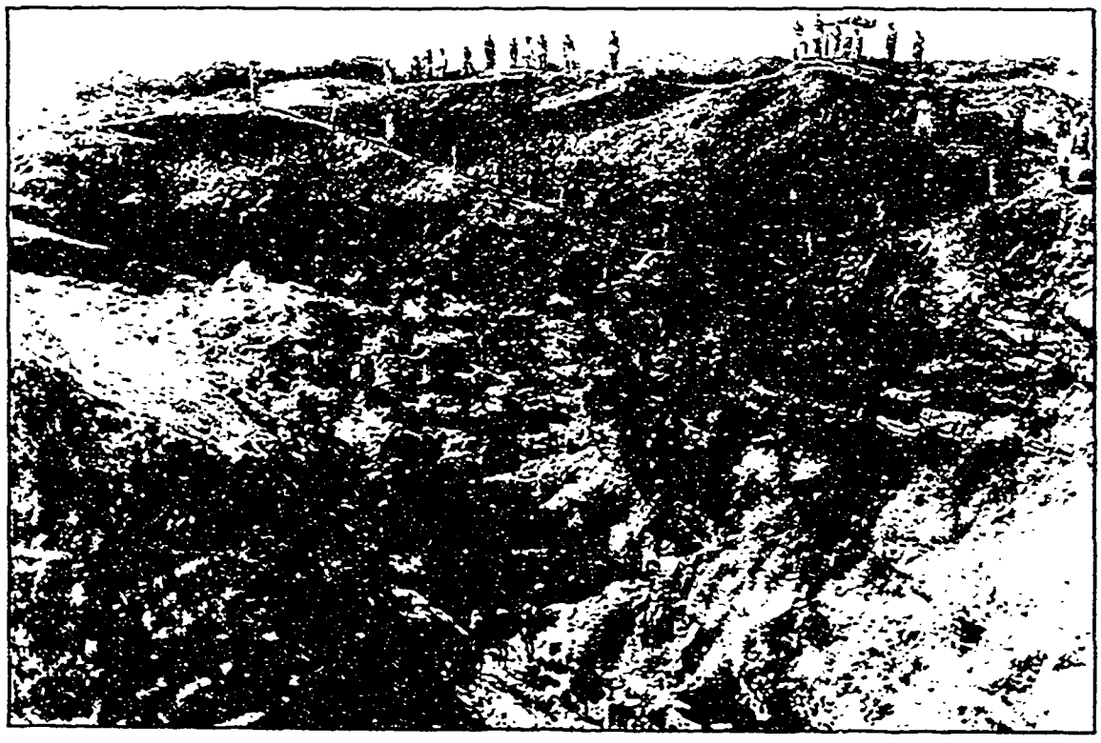
MICA.

For the first six months of the year the mica industry, which is mainly confined to the County of Ottawa, showed considerable activity, the mineral being in good demand for electrical and other industrial uses and prices, notably for the smaller sizes, were better than in former years.

The principal producers were the established undertakings of Blackburn Brothers and the Wallingford Mica Company in Templeton, the Glen Almond Mica Company, near Buckingham, Fortin & Gravel and the Nelles Mine in Hull. Desultory mining was also carried on on a large number of areas in Ottawa County. Towards the close of the year the market weakened, owing to causes not very well understood, and shipments fell off considerably. This depression, we believe, however, is only temporary. It is understood that arrangements are well forwarded towards the organisation of a combined pool on the part of the mica producers in Quebec and Ontario



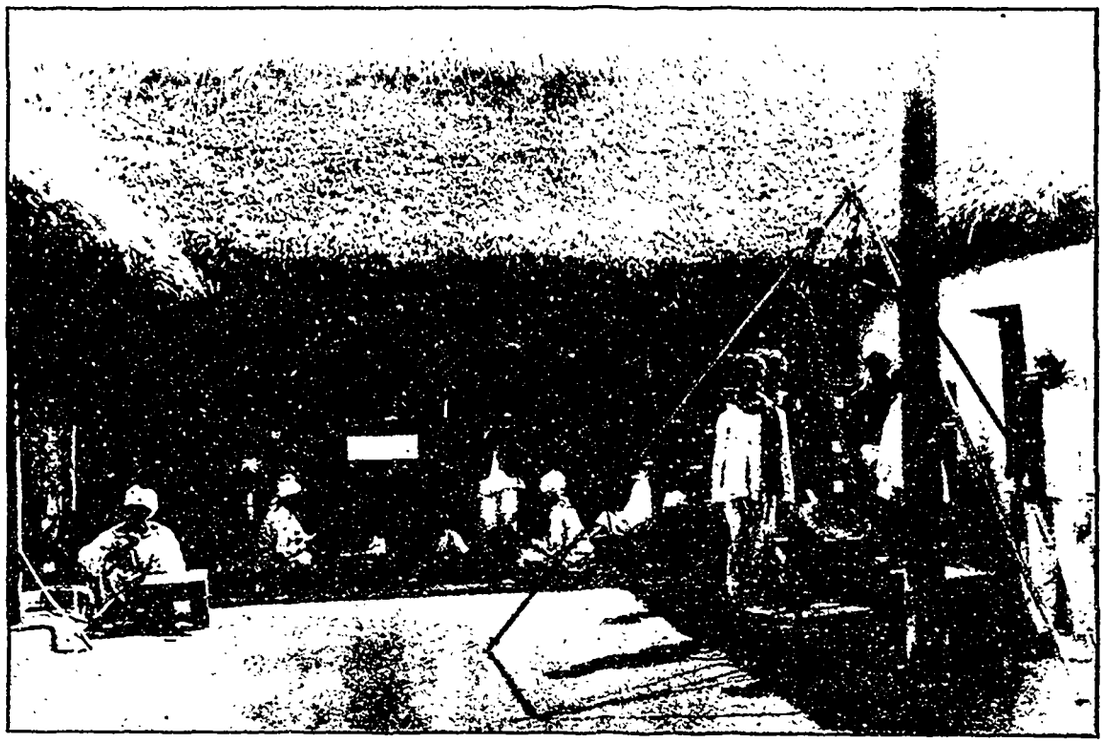
Mica Mining in India. Open Cast Workings, Shah Mine, Madras.



Mica Mining in India. View of Open Cast Workings, Pollimite Mine, Madras.

Mica Mining in India. Corpalli F Mine, Madras.

Mica Mining in India. Indians Sorting Mica.



Mica Mining in India. Indians Packing Mica.

Mica Mining in India. Sergeant D Mine, Madras.

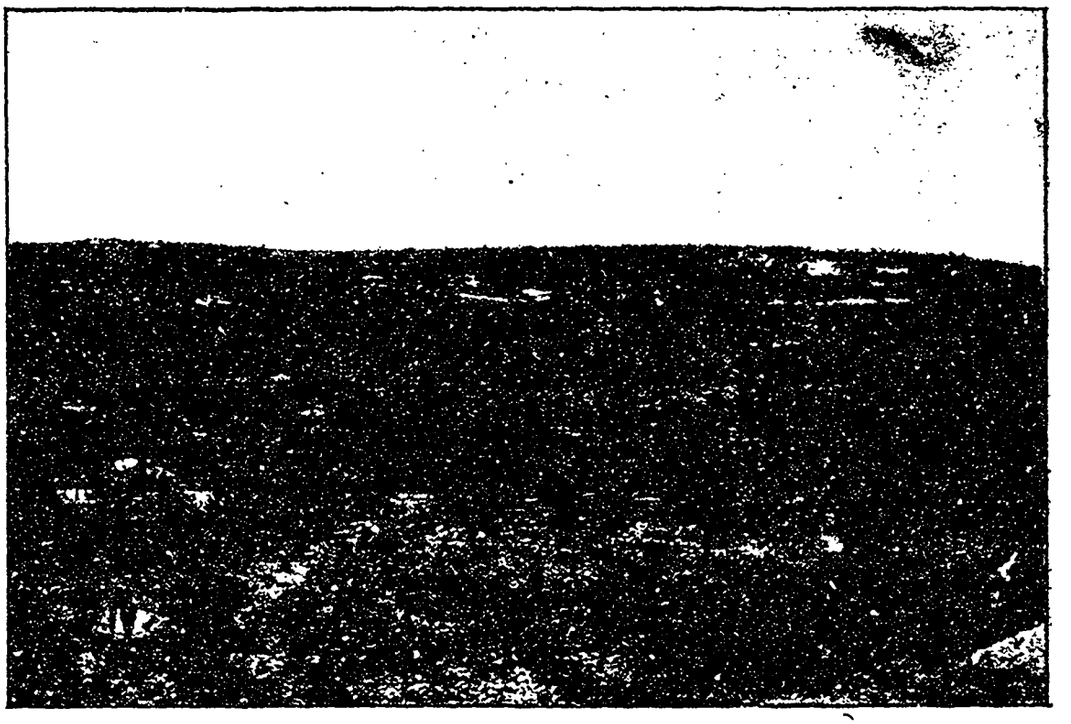
Mica Mining in India. View of Shah Mine from Foot of Hill.

Mica Mining in India. Indian Laborers Splitting Mica into Films.

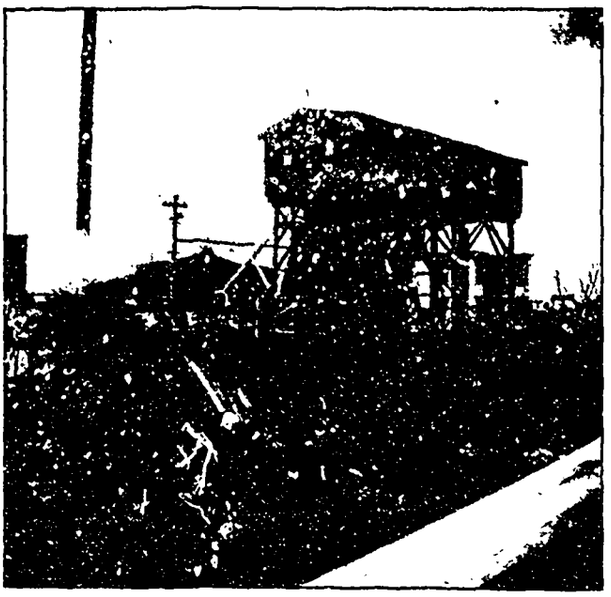
Mica Mining in India. Indian Laborers Cleaning and Trimming Mica.

Mica Mining in India. Sorting and making Mica into Bundles.

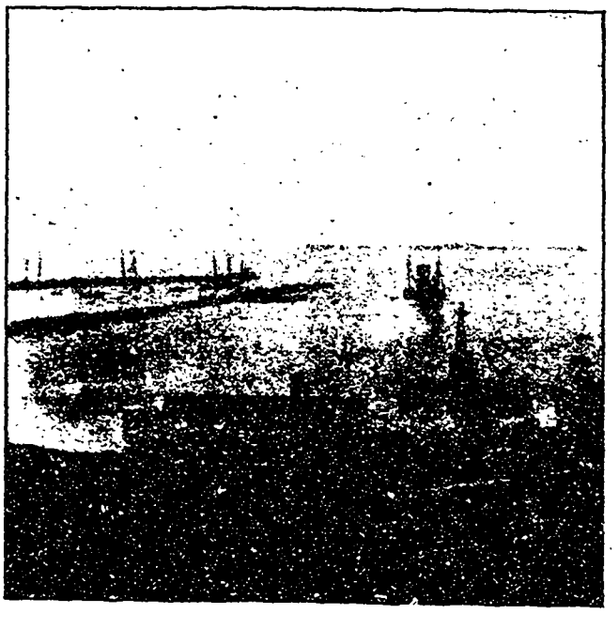
Mica Mining in India. Mica from the Mines being Weighed by Natives.



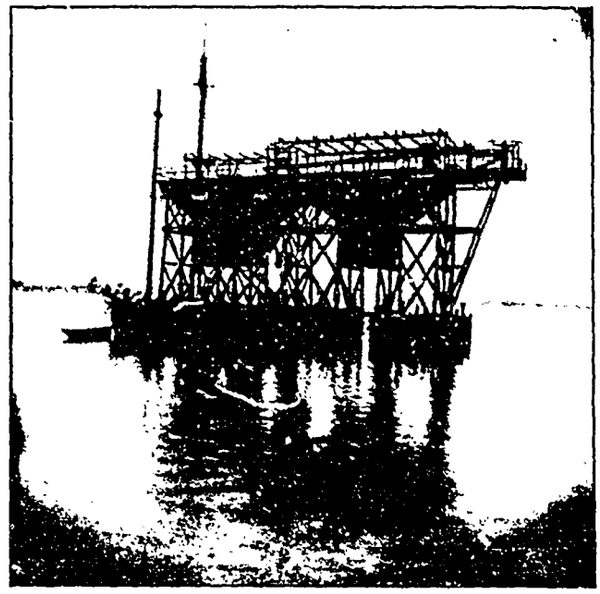
Kuddusabad Depot, India. General View of Mica Bearing Country at Shah Mine.



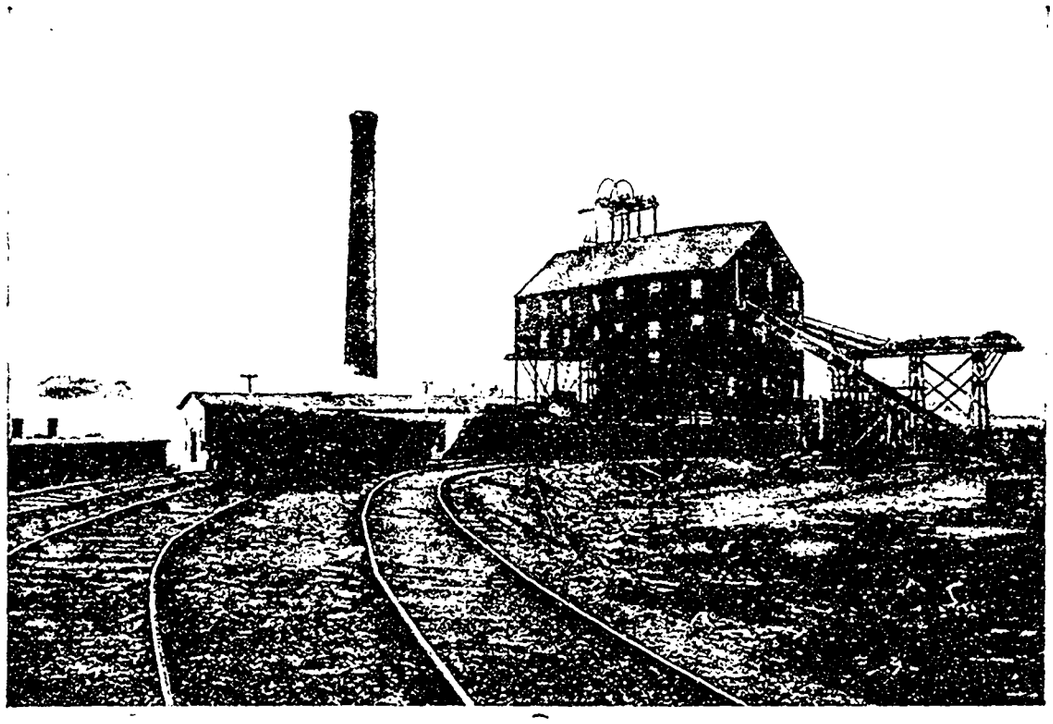
New Colliery of the Gowrie & Blockhouse Collieries, Limited, at Port Morien, C. B.



Aerial Tramway Plant used for Shipping Coal from the Colliery of the Gowrie & Blockhouse Collieries, Limited, Port Morien, C. B.



Loading Station on new Aerial Tramway of the Gowrie & Blockhouse Collieries, Limited, at Port Morien, C. B.



Caledonia Colliery, Glace Bay, C. B., one of the properties of the Dominion Coal Co., Limited.

with the object of maintaining a standard price for this valuable mineral.

OTHER MINERALS.

Borings for petroleum were continued in Gaspé by the Canada Petroleum and other English companies operating in that field. A refinery was also erected but no information is available of the success or otherwise of these undertakings.

The old Wright galena mine at Lake Temiscamingue was taken over and worked by the British and Canadian Lead Company, Limited, an English syndicate having a capital of £120,000.

In the Beauce gold district two shafts are being sunk on the Gilbert River, one of them by the Beauce Syndicate, Limited, an English campany formed in 1899 to acquire the property of the McArthur Bros. Co., Limited, and the other by a local company.

The production of structural and building materials, as in previous years, constituted an important factor in the mineral production of the Province.

NOTE.—The increased output of pig iron should be credited to the Canada Iron Furnace Company at Radnor Forges, and not to the Drummondville Furnaces as stated.

The Crow's Nest Coal Co.

We believe that one of the books which achieved popularity a few years ago in certain circles bore the suggestive title of "The Indiscretions of a Duchess." In another sphere with which we are more concerned the sensation of the month has been the publication of an interview which might be fitly described as "The indiscretion of a Vice-President." To set the mining and railway world by the ears may not be a very difficult or altogether a very unusual achievement for a newspaper man accustomed to yellow journalism; but for the President of a sober, respectable paper like the *Globe* is enough to make honest men like George Brown and Alexander Mackenzie turn in their graves and say, with Hamlet, "To what base uses, &c."

This is the record of Mr. Robert Jaffray, one of the fathers of the Crow's Nest Pass Coal Co. and erstwhile managing director. When one evening after dinner he "granted" an interview to a *Star* reporter at the Windsor, the public learned for the first time that peace and harmony no longer reigned in a once happy family. No, the calumet of peace was flung into the fire and the Hecla of fury blazed up like a volcano. The Jews no longer were to have dealings with the Samaritans. All friendship was a thing of the past, it was to be war to the knife, and with the latent instinct of the professional politician the irascible old gentleman added, "I should like nothing better than a political campaign with the C. P. R. as opponents." The Canadian world opened its eyes very wide next morning when reading these bellicose vaporings, but closed them again in sweet and blissful confidence that the "day of judgment" was postponed when first the managing director—Mr. Elias Rogers—and then others of the directors politely but firmly repudiated their colleague and by the manner of their disavowal made him look as cheap as thirty cents. With this effective *coup de grace* the personal equation falls into the back-ground and we are left to ponder—as we hope the discredited and discomfited instigator will—on the unwisdom of assuming the role of a lion in the garb rendered immortal by Æsop's fable

There is, however, a great deal of interest for the public in general and the mining world in particular in matters which have been stirred up by this "storm in a teapot," for as an esteemed contemporary has well put it, "when politicians fall out honest men get their dues."

The Toronto *Globe*, which is presided over by Mr. Robert Jaffray, and which was an out-and-out defender of the Crow's Nest deal, is burdened with a respectable past and at times is driven to "compound for sins it is inclined to by damning those it has no mind to;" and so driven, no doubt, by little twinges of conscience at the thought of having harbored a too kindly estimate of railway promoters in the past, it has lately inaugurated a campaign in favor of a "Railway Commission" designed to investigate and rectify all the inconsistencies that railways are subject to. This may be a laudable object, and possibly a necessary one, and judging from present indications it may not improbably be achieved; but unfortunately the *Globe* is handicapped in this matter by a past, we mean its recent past, in which it has been the instigator and, largely by its advocacy, the creator of one of the greatest monopolies in Canada, and with it as its only defence the very line of railway which is now the chief object of its attack. Then, it is further handicapped by the positive utterances of the leading men of its party in the very recent electoral campaign to the effect that the Crow's Nest line had solved the question of cheap rates in British Columbia. It is further very badly handicapped by the fact that its President has been enriched to date to the extent of nearly $1,000,000 and still holds stock in the coal company which at the market price is worth over $750,000.

Then it is singularly unfortunate for the reputation of the *Globe* for consistency that this onslaught on the C. P. R. should have been waged just at the time that their President made an attack on them avowedly in the interests of the coal company. The latter are said to be anxious to secure railway connection with the Great Northern for the purpose of entering southern markets. This is a laudable ambition and one not unlikely to be gratified. If it can be shown that it would be a benefit to the Province and not merely to one corporation it should be granted. The onus of proof rests with the applicants. If, however, the project is being pushed and political support secured by the chief members of the coal company simply to furnish them at the country's expense with a weapon to fight the C.P.R., the matter assumes another phase. Canada has already given these monopolists a property valued at $20,000,000. Dr. Selwyn estimated that it contained 2,000,000,000 tons of coal. Their charter secures them $2 a ton at the mine. The published reports of their experts estimate the cost at $1 or less. A very moderate output in a year or two would be *1,000,000* tons a year, which would represent 5 per cent on *$20,000,000, and this in perpetuity*. We doubt if the country has yet begun to understand what it gave these men practically for nothing.

Now, what was Canada supposed to get in return? First, *50,000* acres of coal lands in reserve. Have these yet been located and appropriated by the Government? No. Why? Oh! it may be argued it takes time to complete the surveys. Yes, but meanwhile these monopolist patriots who were so willing to protect the interests of the Province have covered the areas on every creek, and it would take a clever man to find an opening where practical access can be had to the coal. If steps are not taken quickly the country will ultimately get nothing but barren land, or coal outcrops near the top of the mountains only accessible to an eagle or an air-ship.

Then British Columbia was to have cheap fuel and this was secured by a clause inserted in the charter fixing the price at $2. As to whether this is cheap or not is a matter of opinion, since in the neighboring State of Montana, where wages are higher, the average selling price of coal last year was $1.59. It is clear, however, that British Columbia is entitled to get what was bargained for. This, however, she has not had. The price charged to all smelters in British Columbia except the C.P.R. for coke is $5, which is equal to at least $3 for coal. These philanthropists have always boasted their anxiety to assist in giving British Columbia cheap smelting fuel, the one thing essential and the strongest consideration in the granting of the Crow's Nest charter. They prove it by charging $1 a ton more than they are entitled to, and we have no

hesitation in saying that every British Columbia firm which has paid this dollar should have a good case to legally recover it. The public press has stated that the coal company has further proved its sympathy for Canadian industries by selling coke cheaper to American smelters. This, if true, is interesting, and only goes to show that even politicians need watching when they become monopolists.

The conclusion of the whole matter is that the Government should not only be content with a railway commission, but should carry the matter further and give these gentlemen a little of their own medicine. A commission to see how the Crow's Nest charter has been carried out, whether its provisions have been violated as alleged, and in any case to protect the country in the prompt and advantageous selection of the 50,000 acres of coal lands. It was never intended that this latter should be a reserve in name only, and it might as well be in the planet Mars as in an inaccessible peak of the Rockies. Yes, by all means let the *Globe* have a commission—two commissions.

Another Slump In War Eagle.

In a few weeks Canadian investors would have been preparing to celebrate the anniversary of the first sensational slump in War Eagle Stock, but the President, Mr. Gooderham, has seen fit to anticipate the actual date, and either intentionally, or inadvertently, to furnish the material for a repetition of the fiasco of February, 1900.

The medium chosen was a Toronto evening paper, which, on the evening of the 15th inst., published a lengthly interview with Mr. Gooderman, in which that gentleman seems to have made the same kind of a bad break as the Vice-President of the Crow's Nest Pass Coal Co., flinging around reckless charges against the C. P. R, and threatening vengence dire and terrible. We imagine that Corporation is quite able to take care of itself, and if the issue had been confined to it and Mr. Gooderham, we should have said, leave them to fight it out, but the latter saw fit in the course of his interview to assert the impossibility of making any satisfactory terms with the C. P. R. for their Trail Smelter, and emphatically predicted the closing down of the Centre Star and War Eagle mines as a consequence. It is not surprising that the market should interpret this as indicating the near reproach of an end which has long been expected, and the natural consequence was that on the following day (the interview being repeated in the morning papers) War Eagle Stock fell from 85 to 54, and many people unloaded at rates very little above the latter figure.

On the evening of the 16th, however, Mr. Gooderham seems to have discovered by some occult means, that he had been misreported, or, to quote the somewhat ambiguous wording of his denial, "that the statements of the reporter were so misleading that he could not be responsible for them."

He then went on to reassure all persons interested that he had no quarrel with the C. P. R., nor any intention of closing down the mines. As to whether the reporter or Mr. Gooderham is correct matters very little; but what does concern the pnblic, and especially the unfortunate holders of stock, who in a panic rushed to unload at a serious loss, is why Mr. Gooderham, who must have been acquainted with the misleading report on the evening it appeared, should have allowed twenty-four hours to elapse before taking steps to correct what he now declares to be a false report. If he had taken steps, as any right minded business man would have done, to contradict it the evening it appeared, then even if the first report had found its way into the papers the following day, the denial would have accompanied it, and discounted its effect upon the market. A year ago the Montreal Stock Exchange censured Mr. Gooderham for conduct not more questionable than this, and although they pressed him very hard, he was only able to give a reply which they characterized in an official document as "not satisfactory." Possibly the Stock Exchange will not think it worth their trouble to waste any more attention upon a President who is utterly unmindful of the responsibilities of his position. Meanwhile, however, there are other aspects of the question which will not be altogether foreign to the minds of our readers. No one who has followed the history of the War Eagle mine would be surprised at an announcement of its permanent abandoment at any moment. It is ancient history that the General Manager, Mr. Kirby, who is a thoroughly efficient and practical mining engineer, practically turned it down in his last annual report. He told the Directors in so many words, "you have no ore reserves, the future of your mine depends upon development disclosing pay ore." Since then the year's prospecting has been done, and from the monthly reports issued by Mr. Kirby, it is perfectly clear that no considerable quantity of pay ore has yet been discovered. In fact, in his report of November, he specifically stated that there was no change since his last annual report. This is confirmed by mining men who reside in the camp, and who know perfectly well what is going on. Several attempts have been made during the year to create the impression that things were looking up, followed by efforts to boom the stock. Later a report was circulated portending an amalgamation with the Centre Star, but the stock holders in the latter must have found out long ago, that they would only be saddling themselves with a white elephant or something worse, if they shouldered the War Eagle mine. Whatever the future may be it is certain that the War Eagle, on its own merits, can never pay even a modest dividend upon its present capitalization, and it is more than doubtful whether it can even carry its dead charges.

By associatiag it with Centre Star, and smelting the wet ores of the Moyie district with the dry ores of the Rossland Camp, it may be possible to carry it on a little longer, and if the option now taken by the Gooderham and Blackstock Syndicate upon the Trail smelter is converted into a purchase, it may have a short lease of life, but it will always be a dead weight, and according to present showing, there is not the slightest justification for entering into any scheme in which it is designed to become a factor.

COAL MINING AND TRADE.

Since our last issue there has been an insipient strike, among the coal miners of Nova Scotia, which might have resulted in serious consequences for the industries of Eastern Canada which are entirely dependent upon the coal mines of the Maritime Provinces. In view of the efforts now being put forward in anticipation of the new steel industry to be started during the present year at Sydney, it would have been little short of a calamity if serious labour troubles had intervened. The strike only lasted three days and resulted in the concession of an immediate advance of 12% to the miners.

The Cape Bretoners did not join their fellow workmen of the mainland, presumably because wiser counsels prevailed, although the fact that they had received larger advances since the boom in trade began, may also have had some weight. The bone of contention in Nova Scotia was not so much with respect to the immediate advance as to a prospective further 10% in May next. There seemed to be little disposition on the part of the employers to question the right of the men to the present advance, but it was reasonably contended that the great boom in the iron and coal trades, which had characterized the year 1900 all the world over, has unquestionably subsided; and it is impossible to say how much prices may yet fall. In view of a possible depression it was felt that circumstances might render it out of the question to make a further advance this year; however, as matters now stand it is waived, and no doubt the men will take careful counsel before renewing the application. It cannot be said that the miners of Nova Scotia are over-paid, although if they can obtain regular work

they can earn as much in a year as coal miners in any country. The high wages and abnormal selling prices of last year are not a fair criterion from which to judge. It is more reasonable to take the average rate of wage, over a long term of years, and from statistics recently published it may be seen that the average rate of miners' wages in England have for twenty years past been 20% above the standard of 1870. Until the beginning of the present boom miners' wages in Nova Scotia were practically on the same level as in 1870, and as the cost of living is undoubtedly more now than thirty years ago, it does seem as if the standard might fairly be raised to something like the same extent as prevails in the Old Country. In addition to this the men consider themselves entitled to something for the recent high prices prevailing, and this seems to be the rock on which operators and employees split. While it is true that coal was sold as high as $4.00 per ton in the early part of last year, and while probably the whole production of the year could have been sold at from $3 to $4, as a matter of fact the mines had already mortgaged their outputs to such an extent that they were impotent to take advantage of these high figures, and according to the best authorities the average selling price for the year would not exceed $2.25, an advance from normal figures of about 50 cents. If these contracts had not heen made it would have been easy to concede larger advances in wages to the men ; but to have done so, under existing circumstances, would have involved a loss. Nor can the managers be blamed for this because, as is well known, the custom of the country is to contract with all large purchasers for the year's supply, and we hardly see how this is to be avoided.

If some method could be adopted similar to an automatic sliding scale, by means of which wages would be affected more promptly in sympathy with the fluctuations in the market price of coal, it would be much better for all concerned. as it has often happened, at any rate abroad, that the tide has turned before the men have received the advances to which they would appear to be entitled. Probably the most successful sliding scale in existence among miners has been in operation in South Wales for a quarter of a century. Under this arrangement accounts are audited every two months, and the wages adjusted automatically, according to the fluctuation in price. Where, as might be the case, largely in Nova Scotia the coal is consumed by the producers, the price is determined by the figures at which it is sold to outsiders.

Whilst on this subject we might call attention to an admirable arrangement which has been working now for some time in the State of Illinois. We refer to a commission consisting of representatfves of the Illinois Coal Operators' Association and the United Mine Workers Association. To this commission all disputes are referred promply, often times by wire or telephone. The decisions of the commission are received without question, and the important matter of a properly constituted and authoritative tribunal seems to have heen solved. It is especially worth noting that in this instance after some delay, the important, and as we think crucial question of recognizing not only the status of the Union, but of all officials duly appointed by the Union, whether working miners or not, was conceded. This matter has, during recent years, been the subject of more strife between capital and labour than any other. We have always maintained that it would have to be met in a fair spirit, and the operations of the Illinois Commission will be watched with interest by all connected with mining, as having an important bearing upon the future of the labour market.

The statistics of the year's coal trade in the United States have been published and contain several features of interest to our readers ; the most striking of which is the low price at which the coal has been sold at the mine. This is a matter pregnant with suggestion to Canadians, as it lies at the very root of the national prosperity of our industries. If our American cousins have been able, not only to outstrip Great Britain in the production of coal by 50,000,000 of tons last year, but also to manufacture twice as much steel, and successfully to compete in some of the markets of the world, in which the Old Country has hitherto enjoyed a monopoly, it is mainly owing to the cheapness of fuel. It seems almost incredible but is nevertheless a fact that the 220,000,000 tons of bituminous coal produced in the States last year, only realized an average selling price at the mine of $1.02. The bulk of this coal was used in manufacturing industries and the result is a striking commentary upon the policy, which has been so steadfastly pursued by the Americans, in ensuring cheap fuel throughout the country. The highest price registered was in the western State of Montana where wages are comparatively high, and the lowest in western Virginia where there is a large element of black labour. Taking Pennsylvania as a representative State, with its 87,680,331 tons, we find that the average is only 94c.; comparing this with the selling price in Nova Scotia, there is a difference of about $1.30 ; and comparing the average selling price in British Columbia with that in Montana adjoining, there would be a difference of at least $1.50. We are not arguing that Canadian prices should be as low as American at any rate not at present It must he admitted that in the opening up of new industries the capital expenditure is heavier than at a later stage, and many difficulties have to be dealt with, having a tendency to raise the cost. But in Canada, as in the States, if we are to have successful manufacturing industries, we must aim at the goal of cheap fuel. To this end it behooves both capital and labour to be moderate and reasonable in their demands.

Whilst on the subject of American production of coal it may be interesting to note the enormous increase in the export of bituminous coal last year, reaching the considerable tonnage of 5,639,836, an increase over the previous year of nearly 2,000,000 tons. Of this 591,083 went to Europe, chiefly to France and the Mediterranean, against the insignificant figure of 23,272 the previous year. It is generally conceded that this large exportation to Europe was entirely due to the scarcity of coal prevailing at the moment, and that with the reductions that have already taken place in the price of Old Country coal, the market is reasserting itself. It looks more certain than ever, that Canadian coal only, can be advantageously exported to Europe.

Tbe increase in exportation of American coal to Canada during the year is very striking, reaching the considerable figure of 911,795. A least half of this would have been taken from Canadian mines, if it had been forthcoming, the other half could probably at present be delivered more cheaply over the Great Lakes than from any Canadian point of production, as it went mostly to Ontario, but it is not at all certain that these conditions will continue, and we are hopeful that the present year will see developments whereby Nova Scotia coal will find its way into Ontario.

The sudden fall in the price of iron and steel has directed attention to the prospects of the steel trade of Nova Scotia. and doubts have been expressed whether the anticipations indulged in as to tl.e future of that trade will be realized. It is reassuring to find that Mr. Moxham, the General Manager of the Dominion Iron and Steel Co., in a special report prepared for the President, and read at a recent meeting of the company, declared that he was perfectly satisfied that the anticipations that had been indulged in would be fully realized If so, the heavy shrinkage in prices will not appear so formidable as otherwise, the margin in favor of production at Sydney as against American works being considerable, and as this means a guaranteed market for Cape Breton coal, it is of the highest interest. A comparison of the prices ruling in the States during 1900 is very instructive. If we take four leading articles we find that in January Bessemer pig was selling at $25.00, in December at $13.90 ;

basic pig sold in January at $23.75, in December at $19.75 ; steel rails in January at $35.00 and in December at $26 00. Mr. Moxham's estimate of the cost of Cape Breton pig iron is $5.00, and of billets $10.00 to $11.00. It would therefore appear that there is still an ample margin, and that the superior position of Sydney for transportation purposes, must give the advantage in the markets of the world.

We have commented previously on the decreased tonnage of coal sent from British Columbia to Japan, due to the rapid development of the native industry. Just how enterprising and energetic the Japs have been, may be gathered from the fact that last year their production of coal exceeded 7,000,000 tons and their exports 2,000,000 tons. It is said that the average selling price f.o b. is equal to $3.00 per ton ; if so, it cannot be denied that the Japs have found a good market, as although they have considerable engineering difficulties to overcome, especially in the large quantity of water found in their mines, labor is abundant and very cheap. Development of coal mining in Japan is once more directing attention to the splendid deposits of the Aleutian Islands, where coal, far superior to any yet found in Eastern Asia, has been mined on a limited scale for some years, the only market hitherto, with the exception of a very limited local consumption, has been with trading vessels Only recently has it been possible to get a Government grant, but within the last year the American Government gave certain rights to a company, which has since been incorporated, and it is not unlikely that this coal will be developed for the Pacific trade. Although so far north the climate, especially on the southern shore of the islands, is mild, the great Japanese current keeping it free of ice. On the north side, however, Arctic conditions prevail. It is said that the coal has been tested and found satisfactory for steaming and domestic purposes.

Efforts are being made to interest the investing Canadian public in the coal deposit of Graham Island, one of the Queen Charlotte group. It is well known to geologists that this island has extensive deposits of most valuable coal measures, in the Cretaceous formation, and that all grades of coal, from anthracite to bituminous, have been found, including a high-class coking coal, said to be of the same quality as the Crow's Nest. As the outcrops are near the coast, there would be practically no transportation by rail, and water freight to any point on the Pacific would be much lower than from the Crow's Nest areas overland. The rate for coal from Fernie to Vancouver is $5.00, whilst from Graham Island it need not exceed $1.00. It is claimed by the owners that they can make a coke equal to the Crow's Nest, and can place it at the smelters in Everett and Tacoma for $5.00 per ton ; if so, they are assured of a good market, as that is the price of the Fernie coke at the ovens. We shall await with interest the development of this project.

The coal development work conducted by Mr. Cowan at Livingstone, near the entrance to the Crow's Nest Pass, has developed the existence of a seam 6 feet thick and of fair quality. A deep has been driven 600 feet at an angle of 65 degrees, but owing to the steep pitch and a large influx of water, work has been suspended for the present.

Application is being made to incorporate a company under the title of "The Southern Alberta Coal Co.," for the purpose of developing coal areas situated about 20 miles south-west of Lethbridge, between the St. Mary River and the foothills of the Rockies. Outcrops have been traced for four miles and the areas bonded. Samples have been brought east, and analyzed, and show a high-class coal containing 72 per cent. of fixed carbon, 8 per cent. of ash, and less than 1 per cent. of sulphur. The coal has been successfully tested for steam and smithing purposes, and arrangements are under progress for building a branch line from the C. P. R. at the first siding west of Lethbridge. The seams are so accessible that it is expected to obtain a reasonable output during the present year. The capital required is not large and most of it will be raised in the west.

DOMINION COAL CO.

The following are the official returns of this company's output and shipments during the year ended 31st December :—It is estimated that the output for the company's year ending the last day of February next will exceed over 2,000,000 tons. It is intended to increase this during the ensuing year very largely, as there will be two collieries producing greater quantities of coal than at present. It is not too much to expect that 2,500,000 tons will be mined in 1901.

	Output.	*Shipments.*
Dominion No. 1	538,237	
Dominion No. 2	610	
Dominion No. 3	68,831	
Dominion No. 4	25,428	1,831,637
Caledonia	511,874	
Reserve	632,056	
International	222,703	
	1,999,737	1,831,637

Disposals.

	Tons.
Nova Scotia	262,048
Prince Edward Island	15,902
Newfoundland	50,485
Quebec	653,987
New Brunswick	63,183
St. Pierre	5,799
United States	620,867
Bunker	159,366
Colliery Consumption	67,637
Company's Railway	13,438
Colliery Employees	24,258
	1,936,970

Recapitulation.

Shipped	1,829,199
Land Sales	2,438
Collieries and Railways	81,075
Employees	24,258
	1,936,970

ACADIA COAL COMPANY.

Output 1900.

	Tons.
Total Coal Raised	286,045
" " Sold	247,274
" Coke Made	18,637
" " Sold	18,624

Labor.

Employees above ground	269
" below "	579

Coal Disposals.

To Nova Scotia	142,352
" P. E. I.	24,301
" Quebec	31,888
" Ontario	2,842
" New Brunswick	18,937
" Colliery Employees	5,526
" Engines and Coke Ovens	60,012
	285,858

In the item of "Coal Sold" we do not include coal supplied for Employees or Engines.

NOVA SCOTIA STEEL COMPANY.

Coal Disposals.

	Tons.
Shipped	184,348
Intercolonial Railway use	5,429
Local Sales	27,753
Workmen at the colliery, etc	7,617
Coal gifts to widows, etc	405
Colliery use, fixed engines, locomotives, shops, etc	17,225
Sundries	3,394
Total coal raised	246,171

New works have been commenced during the autumn, the construction of some coke ovens and of a coal washing plant.

Some 10 or 12 new dwellings for workmen have been built.

The colliery has changed hands during the year, and is now the property of The Nova Scotia Steel Company, Limited, whose head office is at New Glasgow, Nova Scotia.

CUMBERLAND RAILWAY AND COAL COMPANY, LTD.

The coal sales of this company in 1900 amounted to 396,783¼ tons, distributed as under:—

Nova Scotia	118,328
New Brunswick	234,764½
Quebec	40,365
United States	3,325¾

CANADA COALS AND RAILWAY COMPANY.

New Brunswick		46,837
Nova Scotia		4,527
Quebec		8,629
Employees	1,340	9,487
Engines, etc	8,147	
		69,480

INTERCOLONIAL COAL COMPANY.

Coal Disposals, 1900.

	Tons.
Total coal raised	241,310
" coke made	2,231
" " sold	2,623
Employees above ground	484
" below ground	155

Coal Disposals.

	Round.	*Slack.*	*Total.*
Nova Scotia	68,550	24,762	93,312
New Brunswick	20,070	3,566	23,636
P. E. Island	10,907	3,708	14,615
Quebec	65,351	20,807	86,158
St. Pierre	208	70	278
Coke ovens	....	4,209	4,209
Colliery employees	3,100	560	3,660
Colliery engines	4,786	10,097	14,883
	172,972	67,779	240,751

CAPE BRETON COAL MINING COMPANY.

Coal Disposals, 1900.

To	Tons.
Newfoundland	183
Nova Scotia	1,700
P.E. Island	5,767
New Brunswick	173
St. Pierre	327
Colliery consumption, Colliery employees	2,250
	12,500

The Gowrie and Blockhouse Collieries, Limited, shipped, we believe, about 20,000 tons. The Inverness-Richmond Collieries and Railway Company, Limited, are equipping their Broad Cove colliery with a thoroughly up-to-date plant and will add to the list of shippers during the present year. No figures received at date of going to press from the Port Hood or Sydney Coal Companies.

A Proposed New Method to Raise Coal, &c., in Shafts.

By W. S. GRESLEY, Mining Engineer. Erie. Penn., U.S.A.*

That there is room for improvement in winding machinery, especially for deep shafts and large short-shift outputs, is, I believe, allowed by all mining and mechanical engineers who are interested in the subject; and as mines get deeper and deeper, so does the difficulty of the winding problem become less easy of solution.

Engineers already are beginning to talk about dividing very deep shafts into two or more sections or heights, and so to increase the number of winding-engine units in or for them—to adopt *stage winding*, in fact. As my reading leads me think that this Institute is taking the lead in the discussion of winding matters, I (its only American member) think proper to send this Paper to *it*, rather than to one of the others to which I belong.

Now, it seems to me to be pretty generally admitted that in the case of the deepest and largest collieries the existing winding plants have a total horse-power something like as large again as would be needed to do the same work were it not for the *high speeds* at which the cages must travel in order to land the requisite tonnage in the time allowed for winding; in other words—is not the power developed in these large winding engines in starting the loaded cage and in getting up speed in the shaft 100 per cent. greater than would be the case were the winding performed slowly?

If we regard a winding engine, including ropes, cages, &c., as the *tool* used by the power-generating plant—the boilers (including water, fuel, &c.)—to lower and raise the trams and loads, it seems to me that if this tool or apparatus could be constructed and operated in some other way so that it would accomplish the same ends, but with a great saving in steam, a prospect of its adoption at the deeper shafts, yet to be sunk, would appear.

Since the scheme herein propounded is for slow-speed hoisting, one of two things must be done, namely—either the individual tram loads must be made much larger, or more loads—more trams—must travel in the shaft at the same time. It is of the second method or proposition that I have been trying to think out a practicable solution. I propose to do away with the winding engine—not to *wind* at all, but to elevate, or hoist the coal in trams or other convenient receptacle, without the employment of drum or rope.

This announcement may have a rather startling effect upon many of you, but when I go on to say that my idea is merely the adaptation

* From a paper read before South Wales Institute of Engineers.

of the principle embodied in the old piece of mine machinery called the "man engine," perhaps you will feel less uncomfortable. The man engine to which I refer is that type of same in which two reciprocating rods are employed. Now, if for the *men* riding up and down on this engine we put the word *trams* (loaded and empty, of course), you will, I think, at once "catch on" to my idea, which, of course, is this: that with two parallel rods working up and down slowly in a shaft (something like the two main pump rods of a large double L-bob pumping engine), at the ends of the strokes the trams shall change rods, and so the loads are caused to ascend while the empties descend.

This, then, would be *stage hoisting*, and yet closely approach *endless hoisting*. As there would be an equal number of trams riding on each rod or limb of the apparatus, and the rods and their platforms &c., being practically equal in weight, the thing would be balanced, and only the weight of mineral being hoisted, plus friction of the machine, would require the application of power. This, then, is the proposition in its simplest outline or aspect. The question is, Will it *work?*—will it be *safe?*—can the parts and the details of the outfit be so designed, constructed, operated and maintained that the thing, as a whole, will give satisfaction?

In order to make the *modus operandi* of the hoist more clear to you in detail, I would remark that, instead of using the word *rods*, I propose the word *carriers*, because I question if a single rod for each half of the hoist would be as suitable as, say, two parallel rods, conveniently connected together by cross-bars so as to form what may be regarded as a huge chain or ladder-like structure, between the rods and horizontal bars of which the floors (*cages*, if you prefer the word) to hold the trams would be carried.

Suppose, then, that each of two vertically reciprocating carriers be fitted with an equal number of tram-platforms, arranged vertically one above another at proper intervals so that a sufficient number of arrivals of them at surface per shift gave the desired output of coal; and further, let all of these platforms be arranged in pairs (*see* diagram A), *i.e.* constructed as 2-deck cages; then, since the two carriers will make their opposite-movement strokes simultaneously—commencing as well as ending the same exactly together (like the connected pump-rods referred to above)—at end of every stroke all of the platforms upon one carrier will be brought even with or level opposite to a like set of platforms upon the other carrier, excepting the platforms at the top and at the bottom of the shaft (*see* diagram A). Each deck of every double platform to be designed to hold one tram—the bottom decks are for the loads, the top ones for the empties. Only one deck of each double platform will be occupied whilst carriers are in motion, because during down strokes empties (occupying top decks) will be riding, and during up strokes loads (occupying bottom decks). Thus, aided by the diagram, showing the direction of travel of the two sets of tubes, the method of causing them to pass or dodge one enother in the shaft will be understood. It will be observed, then, that every time each carrier lowers an empty tram into the bottom, the opposite side carrier has raised a loaded one the length of the stroke, to a point or platform next above that in which the said empty reached the bottom. Likewise and simultaneously as each higher-up load is about to be lifted, empties, on the other carrier, are ready to drop a stroke's length. Of course at surface and in the pit bottom suitable running-off and running-on levels or stages would be arranged, fitted with proper "caging" appliances. It will also be evident that to enable the trams to change platforms at the ends of the strokes dead pauses, of sufficient duration must be provided.

If this "man-engine" action is feasible, there remains to be provided suitable, that is reliable, apparatus wherewith to make the trams move over from platform to platform at the proper times; also to hold them in position when carriers aro in motion, as well as mechanism for releasing them for transfer at end of every stroke. Automatic apparatus only can be thought of in this connection, for tilting-bottom cages would be unreliable, and men too expensive as well as uncertain for the job. The trams themselves, then, as long as it is expedient to bring up the coal in them, must run across from cage to cage on their own wheels, or else be carried, run, or slid over upon some kind of a floor. My scheme provides for the former method, and to accomplish this manœuvering of the trams in the shaft I have conceived simple mechanism whereby combined locking, pushing and releasing movements can be obtained. Every deck or platform would be provided with one of these pushers, the position of which would probably be

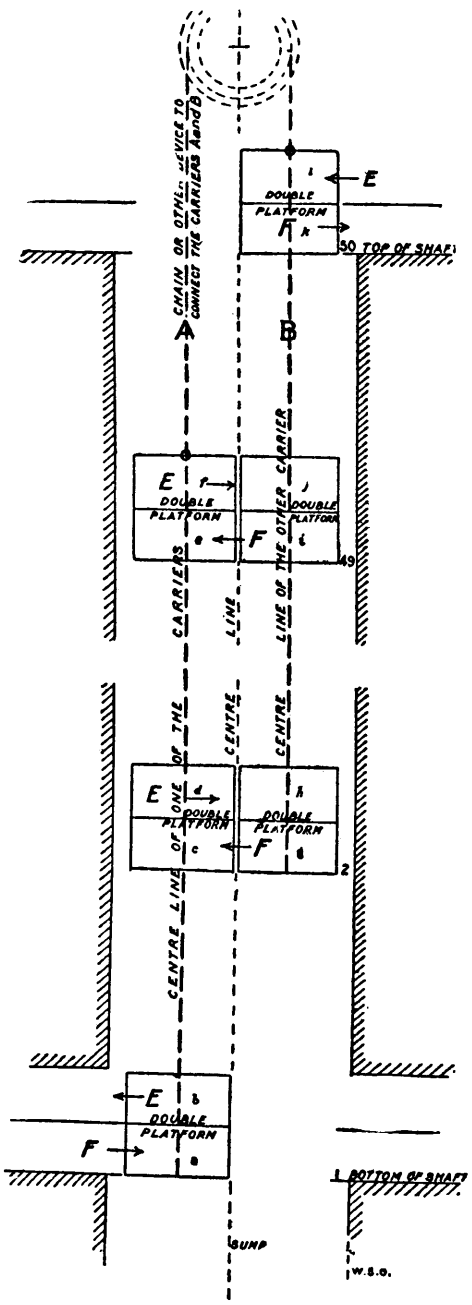


DIAGRAM A.

beneath the tram and about on a level with the rails or track. The pushers to be started by lever, arm or other contact made when the carrier comes to the end of its stroke. The motive power for these pushers to be compressed air or hydraulic pressure as found best. The Westinghouse Air Brake for railway trains furnishes an idea in this particular. To maintain a proper level or horizontality for the transfer of trams, adjusting screws on the carriers would be provided; likewise guide rods of suitable character for steadying cages or resisting the thrust when transferring—when the pushers are at work.

As to the design and construction of the carriers, the speed being

quite slow in comparison with cages and ropes, serious strains. jars, vibration and swag would be practically *nil*, so that a very low factor of safety could be used. Steel, of course, offers the best material for construction. The verticals or side rods might either be made taper, thickest or strongest at top, of course, or the carriers be built articulate, each section throughout hinged or pinned to the one above and below it, yet separately balanced; so that the entire length of the carrier would be practically uniform in quantity or weight of material of which it is composed. This plan might be the more scientific of the two, yet less feasible on account of the complications involved in balances. But these and other details are beside the question as here presented; of course, the plan can never be used unless the difficulties are overcome, and the working of the thing as a whole shall be as reliable as existing systems.

The lift or hoist proper, having been thus designed or conceived, their remains the all-important part of the outfit, to be called the motor or hoisting engine, for consideration. Presumably the strokes will be very long, the duration of the pauses some seven to ten seconds each, and the speed of the carriers, say, 6 feet or so per second. The horse-power will be found by the ordinary rules, when the tonnage is given. All things considered, direct-acting hydraulic pistons or rams, driven by high class steam engines and pumps, with or without an accumulator, would seem to me to be about what is wanted; but this being more within the province of the mechanical engineer than the mining man to work out is not the burden of this Paper.

Obviously, the nature of the work to be done is that of a direct upward pull or push applied first to one carrier (ram or piston), then to the other—the power being transferred from the one to the other every few seconds. The scheme, then, *seems* to possess no feature that could not be controlled or operated automatically from the throttle of the main engine to the caging apparatus in the shaft bottom; moreover, it *seems* to point to economy in the matter of fuel, supplies, and wear and tear or maintenance as compared with the use of ponderous drum-winding machines and hurricane-speed cages, &c. I do not say anything about head gear for such an equipment—none, such as is now required would be needed. Overwinding could not occur. A modification of my ideas might evolve something practicable, if the scheme herein is to be pronounced impracticable.

THE ASBESTOS INDUSTRY.

Our correspondent at Thetford Mines writes under date of 18th instant: "The production of asbestos, which has increased to large dimensions in 1899 and 1900, gives unmistakable evidence that the ensuing year will be the greatest in the history of this most important Canadian industry. During the past year the output may be stated to have amounted to a little over 19,000 tons, and I should not be a bit surprised if it reaches 22,000 tons in 1901. The Johnson's Company, in addition to the old mill that they were running, have about completed a very large mill, which ought to give them a very much increased output. King Bros. are at present engaged in the erection of a very large mill in addition to the one already in use; this mill will be equipped with one of the most modern plants, which will largely increase their output for 1901; and just here I may add that their 1900 output was the largest they have ever had and amounted to something like 5 000 tons. The Bell's Company are making considerable additions to their plant in 1901 and their output will be considerably increased over 1900. The Beaver Asbestos Co's mine, which has been closed down for the past four years, has resumed operations and are now equipping their new mill with one of the finest plants that has ever been put up in the Thetford District. They expect to have their mill in operation about May 1st The mill building is about 150 x 60 feet, and is four and a-half stories high, all framed with 12-inch square timber. Mr. E. C. Bacon, of New York, is the engineer in connection with the work, and Mr. H J. Williams, resident manager, is looking after the construction. The engine and boiler plant in connection with the new mill will deliver about 550 h. p., and all machinery in connection with it will be built by the Jenckes Machine Co., of Sherbrooke, under the supervision of Mr. Bacon of New York. There is some talk also of opening up the Ward Ross property in the spring, which will no doubt add considerably to the output.

At Black Lake the Johnson's Company are erecting a very modern mill over what has proved to be one of the most successful mines ever operated in the district. The output of No. 1 is fully equal to that of any mine in the Thetford district for the last year and the quality of the material was fully equal to anything ever mined at Thetford. There is no doubt but that when the mill plant they are now working on is put up they will have a very large output from this mine also.

The Wertheim, or Union Mines, have added considerably to their plant and claim that they will make a very large increase over their 1900 out-put.

The Canadian Asbestos Co who have had a fairly large out-put for Black Lake for 1900 will no doubt increase their out put this year also and it is also expected that the Anglo-Canadian Co. will open up their property in the Spring. The demand for asbestos is so great that there is hardly a ton available anywhere and the indications are that the increased out-put will be nothing like the demand during the ensuing year. The business as a whole was never in such a flourishing condition as it is today and even with an advance of 25 per cent in wages, which was made in April 1900, labor is very scarce and from 200 to 300 more men could be employed immediately if they were available."

COMPANY NOTES.

St. Eugene Consolidated Mining Co.—At the annual meeting of shareholders held in November last the old board of directors was re-elected. The capacity of the company's concentrator has been increased to 400 tons per day. Shipments during the past few months have been at the rate of 2,700 tons per month. On 1st instant a dividend of three per cent. was paid and it is the intention of the directors to continue this quarterly. The following is the financial statement of the company for the ten months ended 30th September last:—

ASSETS.

Mines and mineral claims		$3,200,000 00
Cash in banks—		
Bank of Toronto, Rossland	$38,046 46	
Bank of Toronto, Toronto	289 93	38,336 39
American Smelting and Refining Co. (Due for ore shipped but not paid for)		94,717 85
Machinery, buildings and equipment—		
Compressor plant	15,226 47	
Boiler plant	6,382 32	
Concentrator plant	35,164 25	
Air line	8,879 09	
Yard facilities	1,430 57	
Tramways	10,105 41	
Machine drills and fittings	5,263 20	
Mine buildings	6,502 55	
Offices and sundry buildings	7,074 24	
Flumes	18,506 34	
Cars and rails	3,809 18	
Wagon roads	912 57	
Crown grants	380 25	119,636 44
Stores on hand		12,323 94
		$3,465,014 62

LIABILITIES.

Capital stock	$3,202,000 00
George Gooderham (advances and interest)	136,938 93
Amounts payable	1,166 66
Profit and Loss	124,909 03
	$3,465,014 62

PROFIT AND LOSS.

To Cost of mining and developing Company's properties, as follows:—			
	Mine labor and supplies	$148,993 89	
	Compressor labor	2,973 93	
	Compressor supplies	3,398 81	
	Machine drills and fittings	3,908 68	
	Tramways expense	6,964 38	
	Salaries	5,850 00	
	Office expense	3,295 08	
	Assay office expense	1,086 70	
	Surveying	2,090 97	
	Concentrator expense	12,675 99	
	Sundry expense	3,020 54	
			$194,258 97
"	Amount written off for deprecation		14,662 27
"	Travelling expenses		245 00
"	Interest and exchange		5,769 21
"	Legal expense		2,172 49
"	Taxes		1,893 92
"	Insurance		756 00
"	Stock discount		1,000 00
			$220,757 86
"	Balance		124,909 03
			$345,666 89
By	Ore sales (9,043 tons) 5 months		343,736 47
"	Rents and sundries		1,930 42
			$345,666 89

Athabasca.—The capital stock is to be increased £10,000 for the purpose of acquiring the entire assets of the Exchequer Gold Mines Limited, owning the group of the same name on Morning Mountain, Nelson Div-

ision, B. C. The shareholders of the latter Company will receive the £10,000 in Athabasca stock in full payment for their assets. As the properties are adjoining they can under one management be worked more economically than heretofore. A tram will connect the Athabasca mill and the Exchequer properties. Work on the latter will be resumed immediately and development, now amounting to 750 feet of tunnels and 100 feet of shaft, will be vigorously prosecuted.

North Star.—This great silver-lead producer has shipped during the past year 17,500 tons of high grade ore, and promises to eclipse this record in 1901 for already the output is 2000 tons per month. Eighty-five men break down the ore, a clean galena, and it is delivered to the cars by a tram having a daily capacity of 200 tons. Dividends at the rate of 12 per cent per year are being paid, and besides this a large amount is being reserved and an equally large sum is being put back into the mine in development. The great trio—St. Eugene, Sullivan and North Star—will soon attract as much attention as the "Silvery Slocan."

Paradise.—This is the latest addition to that growing family—Canada's producing mines. This group in the Windermere Division, B. C., is a young mine, having been located in August, 1899, but already there is on the dump 10.0 tons of carbonate orr averaging $45 per ton in silver and lead. The vein is a contact between blue lime-stone and slate and in the lower workings averages 40 feet in width. Development consists of about 400 feet of work which will be greatly augmented this season. Depth on vein is now 100 feet but when the new tunnel and upraise are completed it will be 375 feet. The ore is brought out over a 4½ mile trail built by the owners of the group and a 12 mile Government wagon road to Golden; the cost is $7 85 per ton. There is said to be $100,000 worth of ore in sight.

Pittsburg Reduction.—This Company has just finished at Shawinigan Falls, Que., a plant for the reduction of aluminum from Canadian corundum. The plant cost $250,000 and will begin operations at once. It is the first of its kind in this country and the building of it is another evidence of the value of our corundum deposits.

Triune.—This celebrated Lardeau mine lately shipped 72½ net tons ore to the Trail Smelter which gave the following average returns per ton: Gold, .98 ozs.; Silver, 336.4 ozs.; Lead, 50½ per cent. The gross value of the shipment was $17,874.68 from which must be deducted Freight and Smelting charges, $1,600 30; Hauling $2,200; and Government Tax, $377.20, leaving irrespective of cost of mining and sacking, a net profit of $13,697.18, or $194.28 per ton. This is remarkable and speaks well for the quality of their ore, but it must not be thought this is the average value of ore in the mine. It was probably most carefully sorted—what else could be expected when transportation charges alone, to say nothing of cost of mining or smelting, amounts to $49.20 per ton?

Van Anda.—85 per cent of the capital stock has been acquired by John Lowles for himself and other English investors and on Feb. 1st. the management will be undertaken by Mr. Lowles' son, prominent in South African mining circles. The transaction means an expenditure of $500,000 besides whatever may be expended for future development and betterments. The Van Ada Copper & Gold Mining Company owned 25 mineral elaims, a townsite, smelter, tramway, &c, and had spent about $600,000 in development work, smelter construction, etc. It will require at least a like amount to open up the immense amount of ground covered by the claims involved and by that time (providing surface indications are found to be the outcrops of correspondingly large ore bodies under ground) with a smelter having a daily capacity of at least 100 a return may be expected. But with limited capital to make profits from these large low grade copper gold deposits was beyond hope. Now that men financially capable of doing the things, necessary have acquired the properties it is believed with reason that the Van Anda will in the course of a few years be a large and profitable producer.

Slough Creek (Limited.) – Registered on December 7 by Pakeman and Reed, 11 Ironmonger Lane, E.C., with a Capital of £200,000 in £1 shares. Object: To acquire the business of the Incorporated Exploration Company of British Columbia (Limited), to adopt an agreement with the said company and its liquidator, and to carry on the buisiness of miners, mineral and ore workers, and merchants, explorers, dealers in precious metals and stones, financiers, contractors, engineers, &c.: to acquire any mines, mining rights, metalliferous land, alluvial ground, and other property in any part of the world, to develope deal with, work, and turn to account the same in such manner as the company shall see fit. The number of directors is to be not less than two nor more than five, the first are to be appointed by the subscribers. Qualification, £250. Remuneration, Chairman £12 10s. per month, ordinary directors, £8 6s. 8d. per month. to be increased according to profits. Registered office, 58 New Broad Street, London, E.C.

British Columbia Minerals (Limited.)—Registered December 12, (capital £10,000 in £1 shares) to acquire the Lahore Mine at Nicola Lake in the Kamloops Division of the Yale District of British Columbia, and to carry on the business of miners, smelters, engineers, &c. Registered office, 2 Copthall Buildings, London, E.C.

Nimrod Syndicate.—The Manager of the Atlin Mining Co., Limited, under date November 24th, sends the following report to the directors of this syndicate of work done on McKee Creek, Atlin, during his visit to England:—

"Found the gravel on 20 below Discovery good, estimated to run from $3 to $4 per yard.

"Found rich gravel on benches on left-hand side of Discovery claim.

"Fonnd rich gravel on benches above Discovery fully as rich as in creek bed.

"Found richer gravel in creek on Discovery claim than any that has been previously worked.

"Found good pay on bedrock on all the ground that has been worked over, the bedrock not having been properly cleaned by the placer miners.

"I believe there is as much gold yet on the ground that has been worked over as what has been taken out.

"Staked fourteen bench claims, eight below and six above Discovery, and found good prospects on nearly every one of them.

"Believe some of the benches above Discovery richer than anything that has been worked in the creek."

The Highland.—The Hihland Mine at Ainsworth is now shipping ore after only five months' work. A test shipment of 100 tons has been now sent to the Hall Mines smelter, Nelson. The company has already expended no less than $150,000 in purchase, development and plant. The property is a silver-lead proposition, the ore carrying an unusually high percentage of lead. Its management estimates that the clean ore and concentrates will run 62.5 per cent. in lead, and 30 ozs. in silver. The company has recently purchased the Kootenay claim, and has staked out other property, forming a continuous line from their outside claims to the shore of the lake. The principal vein on the group is a ledge 8 to 10 ft. wide, and carrying several shoots of clean ore, the balance being concentrating. The vein is developed by three tunnels at distances of 100 ft. apart vertically and connected by upraises. Of these, the middle or No. 2 tunnel, is on the vein for a distance of 800 to 900 ft., the No. 1 tunnel has been driven in ore throughout, and the No. 3 tunnel which was recently staked has cut the vein also. Outside the lower tunnel are the ore bins, with a capacity of 400 tons, and bunk-houses, offices, &c., for the accommodation of men. An aerial tramway 4,600 ft. long connects the ore bins with the mills. A second ledge parallels the principal vein at 250 ft. west. It has been opened in two places showing clean ore, but the present owners have not developed the vein yet. On the Kootenay claim is a third parallel vein opened out by the former owners. The concentrator is progressing to completion and is expected to be in operation by the middle of this month. It will have a capacity of 100 tons daily. Power is obtained from Cedar Creek, a flume delivering 200 miner's inches of water under a head of 450 ft. on four Pelton wheels. Near by are bunk-houses, an assay office, and other buildings. A self-acting incline leads from the mill to the wharf, and the company estimates the cost of putting the ore on board the barges at the low figure of 20 cents a ton. On the lake front a permanent wharf and floating ship have been built. The company expects to employ from 50 to 60 men from now on, and to ship from 500 to 900 tons of clean ore and concentrates per month. A contract has been closed with the Hall Mines smelter to handle a part of the output.

Rock Lake Mining Company.—The development of this company's property is being actively prosecuted. The Rock Lake mine is situated about 12 miles north of Bruce Mines, Ontario, the holdings of the company comprising the n. half of lot 2, concession 6 of Plummer, the n. half of lot 3, same concession, s. half each of lots 2 and 6, and all of lots 3, 4 and 5, concession 1 of Coffin, district of Algoma. The corporation has the title the Rock Lake Mining Co., Limited, with the following officers: President, M. Wile, Buffalo; secretary, L. C. Holden, Sault Ste. Marie, Mich.; treasurer, B. C. Coryell, Chesaning, Mich.; general manager, Arthur S. Burrows, Bruce Mines, Ont. The ore consists of chalcopyrite, desseminated through a quartz gangue with hackly fracture, occurring in diorite, with a wall rock of altered diorite, having a resemblance to slaty structure. The trend of the lode is approximately w.n.w., bearing in the direction of a dike of dark eruptive rock apparently but little less acid than the diorite, through which it was intruded. An up-to-date plant is being installed.

Canadian Gold Fields, Limited.—This company, under the able management of Mr. P. Kirkegaard, continues to successfully exploit the old Deloro mines in Hastings County, Ontario. The milling and mining plant having been fully described in a previous issue of THE REVIEW, the following notes on the treatment of the concentrates will be of interest:—The concentrates after treatment by bromo cyaniding are dried, and then roasted in a revolving cylinder roaster. The fumes are condensed in a serious of brick chambers with vertical baffle-walls. The fumes are collected from the condensing chambers and refined by re-roasting in a special form of reverberatory furnace, the fumes being condensed in a second set of brick chambers. Separate, securely sealed rooms are set apart respectively for bolting the arsenic and for packing. The arsenic is packed in kegs by the aid of an automatic jumper, and all kegs are plainly labelled and cleaned for shipment. A double wash-room is provided for the workmen, one part for clean clothes and the other for the clothing to be worn in the works.

Granby Consolidated Mining and Smelting Company.—Mr. A. B. W. Hodges, superintendent of the smelter at Grand Forks, B.C., reports the operations last year as follows:—"Our first furnace started on August 21st, and during that month smelted 2,902 tons; during September one furnace smelted 8,753 tons, and on the 13th of October the second furnace was blown in, and the smelting total for that month was 14,215 tons; November, two furnaces smelted 18,050 tons; December, two furnaces smelted 18,467 tons; making the total smelted for 1900 of 62,387 tons. The total output of matte for that period was 2,200 tons. This matte averaged about 51½ per cent. copper, and of course contained gold and silver values. All this ore came mostly from the Ironsides, Knob Hill and Victoria claims. We have smelted about 4,000 tons of outside ores during this period"

British Columbia Copper Company.—At this company's smelter considerable progress has lately been made. Practically all the plant and machinery were received before Christmas, excepting the engine for the stamping mill. The main engines, boilers, blowers and the electric light plant are all installed, and water and blast pipe connections with the furnace are made. The sampling machinery is being put in. There are about 5,000 tons of ore in the bins, and more is coming down from the company's Mother Lode Mine regularly. Coke will arrive shortly. Other preparations for blowing in the furnace are well forward, so that the starting will not be long delayed.

Standard Pyritic Smelting Company.—The buildings for this smelter are finished, the furnace is being erected, sampling machinery installed and railway connections made. The beginning of February is given as the time smelting operations will start.

Port Hood Coal Company.—Mr. John Johnstone, for many years identified with active coal mining in Nova Scotia, and for several assistant to the manager of the Dominion Coal Company, has been appointed

manager of this company's colliery at Port Hood, C.B. Preparations will at once be set on foot for the erection of a bank-head capable of handling a thousand tons a day. The bank head will have fixed screens, and will be so constructed that picking tables may be added at a future time if needed. The angle of the seam being fairly steep, the ordinary system of slope haulage will be employed. Eight fifteen to twenty hundred weight boxes will constitute a rake. A pair of 20 x 42 inch cylinder hoisting engines have been ordered; as has also a pair of Babcock and Wilcox boilers each of 250 h.p. There will be a pair of hoisting 7 feet drums capable of winding a mile of 1 inch wire rope. A fan of high capacity, capable of producing 200,000 feet of air per minute will be supplied by the Dicksou people of Scranton, Pa. The winding and fan engines will be built by Messrs. I. Matheson & Co., of New Glasgow. It is proposed for the present to order one side of a duplex compressor for mining and pumping. If mining machinery proves a success, the other side of a compressor will be ordered and thereby sufficient power obtained for mining all coal by machinery It is Mr. Johnstone's intention to at once proceed with all foundation work, so that when the machinery comes to be delivered in April all parts can be placed in position on their final resting beds. The main slope is now down 1,100 feet, and sinking will continue. In preparation for early summer shipments levels will be driven by machinery, starting in the slope at a distance from the surface of 1,000 feet. This will allow balances to be driven up at least 350 or 400 feet long, and still leave a sufficient barrier between the new and the old workings. The mine will be worked on the bord and pillar system. Coal will be shipped during the greater part of each yerr from a substantial wharf 1,400 feet long now in course of construction, and which it is intended to finish during the winter on the ice. At the end of this wharf the depth of water will be thirty feet. In winter time shipments may be made over the Inverness and Richmond Railway at Port Hastings, or it may be that, by and bye, a winter port may be found at Caribou. The coal from the mine to the pier, about a mile, will be carried by aerial tramway. This mode of transit is bound to become popular, as it saves a large amount of superstructure The coal will fall from the screens into the tram buckets. The power at present at the colliery is sufficient for an output of 150 tons per day; and will be ample until the heavy machinery is in place. From what is known of the new manager it goes without saying if that all work will be done efficiently and expeditiously and that the new mine will be among the large producers in the near future.

British Columbia Chartered Company.—Drifting and crosscutting on the 450-foot level of the B.C. mine, Summit camp, is now in progress. Between the first and second levels the ore body is 65 feet wide and 460 feet long, and at the third level it is 40 feet wide, but contains higher values. Last week's shipments were 1,000 tons.

Gowrie and B ockhouse Collieries, Limited.—Our illustrations this month include three photos of the new colliery opened at Port Morien, Cape Breton, by this company. An excellent plant has been installed. Loading pier No. 1 recently finished; height from water to summit 46 feet; capacity of bins or pockets 400 tons; pockets divided into four compartments, each with separate tip or coal chute for vessel's hatch. By means of these pockets vessels are loaded as fast as trimmers can handle coal in the vessel's hold. The pier is isolated from, but connected with the colliery, 1,400 ft. distant, by steel cable, operated on the endless haulage principal, with this difference, that the cables both haul and carry the coal in ½-ton carriers to the pier. The coal slides off the screens at the pit-head into these carriers, and then passes to the storage bins at the pier The cable plant has been furnished by the Ropeway's Syndicate, Limited, (Roe & Bedlington's Patent), and has a capacity of 1,000 tons per day. Pier No. 2, for ocean steamships, is now under construction, with a designed capacity of 2,000 tons. 106 persons were employed at this colliery last year.

Inverness-Richmond Collieries and Railway Company, Limited.—The opening up of this company's valuable colliery at Broad Cove is being pushed rapidly forward under the supervision of Mr. Charles Fergie, the company's consulting engineer. A complete plant will be installed in the spring.

Brookfield Mining Co.—Since this well-known Nova Scotia gold property was acquired by its present owners 52,075 tons have been extracted and the total value of the gold yield has been $430,464. The returns for 1900 were 3,083 oz. 2dwt 13 grs from 8,989 tons of rock milled.

Sydney Coal Co.—This Company's output was increased to about 9,000 tons last year. As the workings go to the deep the coal improves, the seam now averaging 4 ft. 6 inches.

Mines Exploration.—This is a new syndicate, incorporated in B. C. to acquire from Mahon, McFarland and Mahon, Ltd., options or bonds on the "Lorne", "Woodchuck" and "Sure Winner" Claims, on Cadwalladar Creek, a tributary of Bridge River, Lillooet district, B. C. The directors are:—Leslie Hill, J. W. McFarland and Edward Mahon, Vancouver; Arthur N. Pelly, Greenwood, B. C.; and Claud R. Watson, Vancouver. The authorized Capital is $150,000 in shares of $1 each The development of the properties is proceeding and the results so far are reported to be encouraging.

Ottawa Gold Mining and Milling Co.—The Secretary reports the following bullion returns from the Sakoose Mine, Lake of the Woods:—

	Tons Crushed.	Value.	Bullion.
1st. December	293	9.65	$2,831.63
15th December	207	10.56	2,194.64
3rd. January	189	9.31	3,185.95
21st. January	236	7.83	1,848.72
		Total,	$10,060 98

The last brick is some $2.00 per ton lower than usual owing to the crushings having been taken from low grade material mined in development work. The crushing capacity at the company's Keewatin mill has been increased to 20 stamps on this ore and returns in the future are expected to be larger.

MONTREAL-LONDON.

ANNUAL GENERAL MEETING 8TH JANUARY, 1901.

The Fourth Annual Meeting of the Shareholders of the Montreal-London Gold and Silver Development Company was held at the Mechanics Hall, Long Room, 204 St. James Street, Montreal, at 11 A.M.

The President, Wm. Strachan, called the meeting to order and the Secretary read the notice calling the meeting.

The Minutes of the third Annual General Meeting were read and approved.

The following report and statements were read and submitted:

In submitting the Financial Statement for the past ten and a half months your Directors beg to briefly report what has been done during that time:

The management of the Company's properties (The Dufferin and Lake Eagle Mines in Nova Scotia) was, until last May, in the hands of Mr. E. A. Daly, mining engineer, who succeeded Mr. B. MacDonald the former manager. From then till the 15th of this month, Mr. L. W. Getchell, mining engineer, has acted as manager, part of the time for Captain James G. Miller (under the option presently to be mentioned) and thereafter on behalf of the Company.

In May last, Captain Miller was given an option to purchase the said properties, in accordance with a memorandum of agreement, a copy of which was embodied in the circular of June 21st, 1900, which was sent to the Shareholders. This option, however, has not been exercised; Captain Miller having fallen sick and failed to carry out his obligations, and especially that of erecting a plant to treat the concentrates and tailings, and the Company having refused to give him an extention of time or to modify the agreement. The properties were accordingly, on the 15th day of August, 1900, handed back to the Company, and Captain Miller's mining engineer, Mr. Getchell, retained as manager.

You were informed of the above by the circular of November 24th, 1900, which also contained a copy of Mr. Getchell's report upon the Mines. In this report, you will remember, Mr. Getchell perdicts that with proper treatment of the concentrates and tailings the Dufferin Mine can be made to yield from $100,000 to $120,000 a year profit. In this his expectations are the same as those of all the Mining Engineers who have had occasion to examine and report upon the property.

As the tailings and concentrates cannot be treated without the installation of a cyanide plant, and as the money for such plant and for the payment of the floating debts and other expenses could not be procured from the Company's present resources without sacrificing valuable assets, your Directors deemed it advisable that Preferred shares should be issued to an amount of $150,000 on the terms and conditions embodied in the last mentioned circular.

In order that no risk be incurred in the installing of the cyanide plant, your Board are now having complete and exhaustive test made of both the concentrates and tailings. In the meantime, and pending the carrying out of the necessary financial arrangements, work at the mine has been suspended except in so far as required to keep the mine dry, fully protect the machinery and to accumulate fuel for future operations.

In the accompanying statement there will be found an amount of $157,363 as the estimated value or cost price of Stock Holdings and Concentrates. The Board desires to call attention to the fact that the Slocan Sovereign shares have been kept at the same valuation as last year viz: 35 cents.

As will be seen from the financial statement submitted herewith the capitalization of the Company is small compared with that of other Companies and if the expectations as to the value of its assets and especially as to the value of the Dufferin Mine are at all realized, the stock of the Company should ultimately prove valuable.

STATEMENT.—ASSETS AND LIABILITIES, ENDING 18TH DECEMBER 1900.

ASSETS.

Dufferin Mines:		
Cost ending 31 Jan. last	$417,664.87	
New Development during 1900	23,725.49	
		$441,390.36
Silver Queen Mine		78,126.00
Klondike expedition and Property		31,601.82
		$551,118.18
Stock Holdings and Concentrates:—		
Estimated value or cost price	$157,363.00	
Bullion Gold Mining Co., 50000 shares		
" " " No. 2. 50000 "		
Champion Gold Mining Co. 50000 "		
Slocan Sovereign Mines Co. 250580 "		
Mountain Lion G. Mg. Co. 25000 "		
Black Tail Gold Mg. Co. 18000 "		
Master Jack Gold Mg. Co. 100000 "		
Concentrates of an estimated nett value $24,000.co to $30,000.00.		
Supplies on hand:		
At Dufferin Mines	$9,229.03	
" Dufferin Genl. Store	3,967.41	
		13,196.44

Accounts receivable	7,174.38	
Office Furniture	472.66	
	$178,206.48	
Cash on hand	2,321.26	
		180,527.74
		$731,645.92

LIABILITIES.

Stock Holders:		
1,948,975 Shares at 24c. each		$467,754.00
Bills Payable:		
Discounts and Current acceptances		86,812.07
Underwriters' Account:		
Advanced payments on ac. Preferred Stock		41,948.20
Atcounts due by Montreal-London,		
For ac. Dufferin Mines	1,589.84	
" Dufferin General Store	1,932.94	
" Montreal office	2,024.25	
		5,547.03
		$602,061.30
Balance Represented:		
by Profit and Loss Acct	99,584.62	
and Contingent Acct	30,000.00	
		129,584.62
		$731,645.92

STATEMENT.—PROFIT AND LOSS ACCOUNT, ENDING 18TH DECEMBER, 1900.

1900. CREDIT.

Jan. 31.	By Balance carried forward from last Annual Meeting		$146,180.09
Dec. 18.	" Amounts credited since:		
	" Prem. on 148,975 shares stock	$5,199.40	
	" Profit on Black Tail stock, sold 27,000 Shares	1,277.07	
	" Bullion Gold Mining Company Dividend No. 3	500.00	
	" Transfer Fees During 1900	263.32	
	" Gold bullion returns from Mint Acct. Dufferin Mines	27,937.72	
	" Bullion Gold Mining Co. Stock Bonus: Bullion Gold Mining Co., No. 2 50,000 shares est'd 25c. each	12,500.00	
	" Champion Gold Mining Co. 50,000 shares, est'd 25c. each	12,500.00	60,177.51
			$206,357.60

1900. DEBIT.

Dec. 18.	To Amounts charged for Management and Expenses:		
	Gen. Expense Acct	$5,441.37	
	Interest Account	5,598.65	
	Legal Exp. 3½ years	4,799.39	
	Option,—Tamarack Group Forfeited	605.00	
			$16,444.41
	" Dividends p'd to shareholders ending 15th August last	47,927.89	
	" Contingent Acct.—Additional placed to credit for 1900	5,000.00	
	" Dufferin and Lake Eagle Mines expenditure for 1900	37,400.68	
			$106,772.98
	Balance at credit		99,584.62
			$206,357.60

On the above report and financial statements being submitted to the meeting DR. L. H. DAVIDSON expressed the opinion that the issueing of preferred stock as suggested by the Board would practically destroy the common stock, and that no action should be taken in the matter until the fullest information had been given to the shareholders.

The President Mr. Wm. Strachan and Messrs. F. L. Béique, David Morrice, R. Wilson-Smith, D. B. Mclennan and Robert Jaffray expressed their willingness to give to the shareholders all the information they possessed, and claimed that the issue of preferred stock was the only way to save the property and protect the interest of all parties concerned. They stated that their individual holdings In the company were very large (the holdings of the members of the board representing nearly ⅓ of the whole stock issued) and that they had not lost faith in the Dufferin property. To prevent the assets of the company being sacrificed by realizing at a time when all mining securities were depressed, and to provide for a cyanide plant &c., it was imperative that the preferred stock be issued.

Attention was called to the following figures: Par value of stock issued to date $467,754 out of which $78,126 was issued in payment of the "Silver Queen. There was paid to the shareholders in dividends to date $117,126. The Dufferin and Lake Eagle properties, including mining and development work to date, represent an expenditure of $441,590. There has been recovered in bullion $54,121 and in concentrates an approximate net value of from $24,000 to $30,000. Besides this, the company has realized a large amount of profits by the purchase and sale of other properties and securities.

The president explained that the reason why so much capital had been expended on the Dufferin property, was owing to the reports of the best mining engineers and experts, who led the Directors to look for much better results than were realized. The Company had consequently expected to mine 200 tons per day at $8.00 per ton giving $1600 per day, from which deducting $300 the estimated daily expenses would have left a yearly profit of $432,000. The Directors felt great disappointment at the result having fallen very far short of expectations, However, the best of mining engineers still adher to the belief that when the mine is properly worked and the gold extracted from the tailings and concentrates by the proposed cyanide plant to cost about $13,000, and by the use of a water power ($30,000), it can be made a most valuable property. By the new cyanide process, a large quantity of concentrates already mined can be at once advantageously treated and by the use of water-power instead of steam, an unusual saving of about $36,000 can be effected. The large acreage of the property, and the fact that some $800,000 of gold was extracted by the old company from a very small area, is most reassuring.

Enquiries were made by some of the Shareholders as to whether the delay to subscribe for preferred shares could not be extended.

The President answered in the affirmative and several of the Directors expressed their willingness to redtce their subscription to said Preferred shares so as to allow each Shareholder choosing to do so to have his *pro rata* proportion of the Preferred stock and thereby fully protect his common stock.

Mr. Isaac Waterman expressed implicit confidence in the Directors. They constitute one of the strongest boards that can be found; they had never taken any renumeration, and had done the best they could under the circumstances. He therefore moved, seconded by Mr. E. H. Copland—"That this meeting approves of the issuing of Preferred stock to the amount of One hundred and Fifty Thousand Dollars, as recommended by the Board; the time for the Shareholders to take their *pro rata* proportion of the Preferred stock to be extended to the first of March next."

While the votes were being taken and the proxies handed in, the old Board were unanimously re-elected as Directors for the ensuing year, and reported as thus elected by Messrs. A. C. Cumming and W. A. Magor as scrutineers, namely:

WM. STRACHAN, ESQ.	T. G. RODDICK, M. D.
HON. A. A. THIBAUDEAU.	CLARENCE J. MCQUAIG, ESQ.
S. H. EWING, ESQ.	ROBERT JAFFRAY, ESQ.
R. WILSON-SMITH, ESQ.	D. R. MACLENNAN, Q. C.
DAVID MORRICE, ESQ.	ROBERT BICKERDIKE, ESQ.
F. L. BEIQUE, Q. C.	J. P. DAWES, ESQ.

Pending the votes being counted, the meeting was then adjourned to the Company's office at 4:30 p. m. same day.

At 4:30 p. m. the meeting was resumed.

Were present:—The President representing self and a large number of Shareholders as per proxies filed and remaining of record, and Messrs. F. L. Béique, Isaac Waterman, and Deblois Thibaudeau.

The President announced that Dr. L. H. Davidson, representing 6365 shares, voted against the above mentioned resolution of Messrs. Waterman and Copeland, and all the other shareholders present or represented and forming a total of 1,159,154 shares voted in favour of said resolution—the whole as per list A and B, signed by the President and the Secretary-Treasurer, and remaining of record as forming part of the minutes of the meeting. The motion was therefore declared carried by a large majority.

On motion of Mr. Isaac Waterman, seconded by Mr. Deblois Thibaudeau, the meeting was then adjourned to Wednesday, the 16th January, 1901, at 11 o'clock, at the Company's office.

At the Adjourned Meeting of the Shareholders held at the office, 180 St. James Street, Montreal, on the 16th January, 1901, at 11 a. m., the Secretary reported that the shareholders present or represented 1,350,914 shares, the same being in excess of the required number of shares.

RESOLVED, UNANIMOUSLY—"That this Meeting again approves of the issueing of Preferred Stock to an amount of 150,000 (625,000 shares) on the following conditions:

(a) "The said Preferred Shares shall be entitled to cumultative dividends at the rate of ten per cent. per annum payable semi-annually.

(b) "The Company shall be entitled to redeem said Preferred Shares, or any portion thereof, at any time before the expiration of twelve months from the date of issue at a premium of five per cent. and accrued dividend and at any time thereafter at a premium of ten per cent. and accrued dividend.

(c) "The said Preferred Shares shall be payable at par, as follows: Four cents per Share on the first day of March 1901; Five cents per Share on the first day of April, 1901; Five cents per Share on the first day of May, 1901; Five cents per Share on the first day of June, 1901; Five cents per Share on the first day of July, 1901.

(d) "A discount at the rate of six per cent. per annum will be allowed on payments in advance.

(e) "That the nominal Capital Stock of the Company be accordingly increased by 625,000 shares, to wit: from 5,000,000 shares to 5,625,000 shares the said 625,000 shares to constitute the said Preferred Stock."

Moved by Mr. D. Morrice, and seconded by Mr. S. H. Ewing, "That the meeting adjourn to the Company's office on the 15th February next, at 11 a. m.' Carried.

RAINY RIVER DISTRICT.

Mining news is rather scarce at this juncture. There is talk of the re-opening of several of the prospects that had been shut down, but no more has yet been made. There is one notable exception, however, in The Stella. Work is to be resumed in two shafts—the one on the Stella vein, and the one on the large vein near the contact. The Stella shaft is down 127 eet, and it is to be put down another 100 feet. The shaft on the large contact vein, carrying much sulphide, is to be continued to 100 feet, and then a crosscut made to both walls; this shaft is already 60 feet deep. It is considered that this work will prove up these two veins, and show whether they are worth anything or not.

This revival of operations at The Stella is due to the exertions of Neil Campbell, Esq.—one of the original discoverers of the veins—who has just returned to Rat Portage from a visit to St. Paul, Minn., where he secured the capital for this work.

Mr. Campbell put through another deal on the same trip. This is on the Sundbla property on the north side of Black Sturgeon Lake, opposite Black Sturgeon mine. This property was located last spring. On the locations there is a wide and well-defined quartz vein, and on this a shaft will be sunk 100 feet, and the vein cross-cut to both walls. An outfit of tools and supplies has already gone out to the place.

Eagle Lake.—At Prendible Island, the Eagle Lake Mining Co.—Mr. N. B. Higbe, of Rat Portage, Manager—the shaft is down 60 feet, and are drifting both ways at the 50 foot level; one drift was in 40 feet a month ago. There is a very fine vein, four feet wide, three feet being good panning quartz.

Messrs. Curran and Stevenson have been developing their claim, which they have named The Vicking. They have sunk three pits to a depth of 15 feet. The vein is about 15 feet wide, and the rock is said to pan very well. They will continue sinking in order to get out enough ore for a test on a large scale.

Baden Powell.—This is owned by Messrs. Farneri and Partington, of Rat Portage, who are carrying on development work. Recently they uncovered in their explorations a new vein, as rich as the one first discovered.

The Manhattan Gold Mining Co. will begin development with the opening of spring. It is said to be their intention to put a boat on the lake for their own transportation work.

The veteran prospector, Ralph McKinstry, is reported to have made a deal on one of his claims with some St. Paul parties.

RAT PORTAGE, Jan. 19, 1901. J. M.

Box Car Loaders.

A new advertisement appears in this issue, and in fact, it is an advertisement of something new in machinery in the Canadian coal fields at least. We refer to the Ottumwa Box Car Loader, manufactured by the Ottumwa Box Car Loader Co., of Ottumwa, Ia., U.S.A. There are probably no coal fields of the world where any larger proportion of the product is loaded into box cars than the fields reached by THE REVIEW. All coal mining managers are familiar with the great cost that is added to the production of coal for the loading of it into box cars. Also, that the loss by reason of the mashing and breaking of the coal in the centre of box cars is considerable. It is claimed by the manufacturers of this loader that these two serious objections are largely overcome by the use of this machine, and that they can load box cars at about the same cost as for loading open cars, and with no more breakage to the coal. This should certainly prove to be a valuable invention, and the machine will probably come into great demand in this country. Patents have been taken out in Canada, and we will be pleased to see our mining men giving this investigation. While the machine was originally designed for loading coal, it is equally adapted for loading almost any material into box cars that requires to be shoveled from the centre to the ends of the car.

MISCELLANEOUS.

Quebec Central Mineral Shipments, 1900.—We are indebted to Mr. J. H. Walsh, General Passenger Agent of the Quebec Central Railway for the following figures of minerals carried over his line last year:—

Brick	6,811	tons.
Lime	8,236	"
Flag Stone	1,325	"
Chrome Ore	2,336	"
Asbestos	19,076	"
Granite	1,232	"

Diamond Drills for Nova Scotia Government.—The Government of Nova Scotia has, we understand, ordered another Diamond Drill for the purpose of exploring mineral areas in that progressive province. That there are very many valuable territories which are as yet unknown from the standpoint of mineral development, is well known to all persons who have been connected with this branch of provincial enterprise, and the fact that the Government is endeavoring to help along the progress of systematic examination of these grounds we think is most encouraging. This will make third the drill owned by the province and within a few months we may expect to hear of some valuable results of the boring operations to be undertaken in various sections of the province. We are told that the demand for the loan of these machines is so great as to make it a difficult matter for the mines department to allot their use in a satisfactory manner.

Calcium Carbide in Metallurgy.—At the Paris Exhibition, Siemens and Halske showed some specimens of metals, notably copper, reduced from their oxides by the aid of calcium carbide. Experiments in this direction had been made by Moissan, Warren, and others, and Goldschmidt had pointed out that the carbide could replace his powdered aluminium in the thermit reductions. In all these cases oxides appear chiefly to have been thought of. B. Neumann has now found that the other compounds might be started with, though so far the oxides seem to be the most promising. The experiment can be conducted in a test tube. Copper oxide and calcium carbide, both powdered, are mixed and heated over a Bunsen burner. The

mass will soon begin to glow. Sometimes the re-action is energetic enough to produce a copper mirror by volatilisation. But the heat does not suffice to unite the grains of metallic copper, mixed with carbon particles, by fusion. Even in clay crucibles only small reguli are obtained. The addition of a flux, borax, or common salt, facilitates matters somewhat, especially in the preparation of alloys from mixtures of the respective oxides. But Neumann did not achieve much with iron, chromium, and manganese. Chlorides may be used; but they must be free of water, lest acetylene generation cause explosions; the complete drying of metallic chlorides is, however, both troublesome and costly. Sulphates answer in the case of nickel and lead; as a rule, the metallic particles will not unite. Carbonates are also troublesome, but copper (malachite) and lead (white lead) give good results. Water glass makes a good flux, and success has been obtained with some metallic silicates. This last observation is encouraging; on the whole, however, the researches do not so far seem to be of any practical value, and most of the melallic impurities would re-appear in the product.

Graphite.—This mineral, which is now so much in request as a lubricator of machinery, is one of the most valuable products of Bavaria, and like the lithographic stone, represents almost a monopoly for the country, as the only formidable competitor in the supply of natural graphite is the island of Ceylon. The production of graphite in Ceylon has, however, diminished from 30,000 tons to from 12,000 to 15,000 tons annually, causing a great rise in prices, as the deficit could not be made good from other sources. The price of Ceylon graphite ranges from £50 to £75 per ton. In Bavaria the graphite deposits are found near Passau, and are inferior to the Ceylon graphite, as while the latter is nearly pure, the former has about 60 to 75 per cent. earthy substances mixed with it. The Passau graphite, however, can be purified by a very simple and inexpensive process, and a substance produced that is quite equal to the Ceylon graphite. Unfortunately, owing to local conditions, this process is little used, as the deposits are spread over a number of small proprietors who work on a small scale in the cheapest manner possible; the result is that there is a regrettable waste of the raw material, and it is alleged that nearly 90 per cent. of the mineral is absolutely thrown away owing to this unscientific and short-sighted system of working, which must lead to the premature exhaustion of the deposits. In 1898 there were 49 graphite works in Bavaria, employing only 216 men, which produced 4,593 tons of graphite, worth £19,583.

Water Gas as Fuel for Blast Furnace.—A recent number of the *Engineer* gives an interesting account of efforts to utilize water gas as a fuel for blast furnace smelting, made by C. C. Longridge. He claims that by employing water gas, the regulating factors, which produce a reducing effect, or otherwise, with ordinary fuel, are non-existent, as the chief reducing agent, carbon monoxide, is produced outside the furnace, and can be introduced and burnt exactly when it is required. He admits that this limits the extent of the fusion zone, a limitation which seems conclusive against such practice in the case of iron smelting at least. The difficulty would not be so serious in the case of lead and copper smelting, and it is even conceivable that it might possess certain advantages, since the atmosphere in this zone could be held perfectly neutral without attaining very high temperatures. It is difficult, however, to see how blast furnace smelting could ever prove successful without the use of solid fuel, since the tendency to agglomeration of the charge could not readily be overcome, and this would prove fatal to reduction of the metal and the proper formation of slags.

Ingenious Automatic Sampler at Deloro.—An ingenious automatic sampler for pulp has recently been designed and put in use by Mr. P. Kirkegaard, manager of the Canadian Gold Fields, Limited, Deloro, Ont. It consists of a bucket of elongated rectangular shape at the mouth, drawn down at the bottom to a small size, where a flexible tube draws off the pulp falling within it. This bucket is mounted on the end of a swinging arm, and is caused to swing across the path of a falling stream of the material to be sampled. This is effected at regular intervals by a simple mechanism, driven by an undershot wheel set up in the launder carrying the pulp to the sampler. It thus runs by its own power. The speed of the mechanism can be regulated so as to take a sample as frequently as may be necessary to secure an accurate average of the pulp.

Asbestos Mining in Canada.—The matrix rock of asbestos at Thetford, Canada, is serpentine, and the asbestos is a silky, fibrous form of this mineral, usually designated by mineralogists as chrysotile. It occurs in veins, seldom in their maximum development over three inches wide, occasionally six, and far more commonly one inch. It is recognized instantly by the sheen and lustre of its surface. These veins traverse the dark serpentine rocks in varying directions, and the excavations made in this hilly country to reach these valuable skeins of mineral thread are very extensive. The production of asbestos from this source, viz., chrysotile, has greatly increased since its first discovery and has now attained the dimensions of a large and valuable industry. There are three grades of asbestos, and of these the second is the most abundantly produced. Much of the floor of the Thetford mines, which is now being deepened, yields a poorer quality than the cliffs or sides. The best grades have been found below the surface. The surface specimens are harsh and asperated. The veins are sharply the separable from the inclosing serpentine, and blow of a hammer will detach adhering rock on either side, liberating the lustrous bar of delicate mineral silk, which, soft and silken in its separate fibres, resists compression in the direction of their lengths. These bars are hackled and converted into woolly-like knots which are afterwards carded and spun into asbestos thread. The treatment of the second and third grade asbestos varies somewhat from that of the first quality, and the final discharge of the jig-sieved fragments meets the discerning inspection of small boys who pick out useful material, which is again worked over. Much of the water-saturated material is dried over in ovens.

Forty-Third Mining and Milling Co.—The annual general meeting of the shareholders was held at Ottawa on 24th. inst. Directors report for the year adopted. With completion of development work, good returns are expected this season from the company's property in the Omenica district, B. C.

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 anuually 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 acquired promptly either by arrangement with the owner or by arbitration all land required for their mining works.

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

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

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

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

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

THE HON. C. E. CHURCH,

Commissioner Public Works and Mines,

HALIFAX, NOVA SCOTIA.

SCHOOL OF MINING,

KINGSTON, ONTARIO.

AFFILIATED TO QUEEN'S UNIVERSITY.

The Following Courses are offered

1—Three Years' Course for a Diploma in

(A) Mining Engineering.
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2—Four Years' Course for a Degree B.Sc. in

(A) Mining Engineering.
(B) Chemistry and Mineralogy.
(C) Mineralogy and Geology.

3—Courses in Chemistry, Assaying, Mineralogy,

and Geology for degrees of Bachelor of Arts (B.A.) and Master of Arts (M.A.)
For further information see the Calendar of Queen's University.

4—Post-Graduate Course for the Degree of

Doctor of Science (D.Sc.)
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Next Session begins October 3rd,

. . . 1900 . . .

Matriculation Examination held at Queen's University, Sept. 20th.
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The School is provided with well equipped Laboratories for the study of Chemical Analysis, Assaying, Blowpiping, Mineralogy, Petrography and Drawing. In the Mining Laboratory the operations of Crushing, Amalgamating, Concentrating, Chlorinating, Cyaniding, etc., can be studied on a large scale.

FOR CALENDAR OF THE SCHOOL AND FURTHER INFORMATION APPLY TO

Dr. W. L. GOODWIN,

DIRECTOR

SCHOOL OF MINING, KINGSTON, ONTARIO.

ANNUAL GENERAL MEETINGS

—OF THE—

Canadian Mining Institute

WILL BE HELD IN THE

CLUB ROOM, WINDSOR HOTEL, MONTREAL,

—ON—

Wednesday, Thursday and Friday, 6th, 7th and 8th March, 1901.

ANNUAL DINNER, FRIDAY EVENING, 8th MARCH.

SPECIAL RAILWAY RATES.

By special agreement with the companies Members of the Institute and any Canadian Mine Manager or Mining Engineer attending these meetings will be carried to Montreal and return for a SINGLE FARE on the CANADIAN PACIFIC, GRAND TRUNK, INTERCOLONIAL, QUEBEC CENTRAL and CANADA ATLANTIC RAILWAYS. Members will ask for Convention Certificate when purchasing their tickets, pay single fare to Montreal, and on having Certificate signed by the Secretary will be returned FREE OF CHARGE.

SYLLABUS OF PAPERS.

The Syllabus of Papers for discussion at these meetings embraces a large variety of subjects of interest and value to Canadian mining men. Among those who have entered their names may be mentioned :—

Mr. HIRAM DONKIN, Glace Bay, C.B.
Prof. COURTENAY DEKALB, Kingston, Ont.
Mr. BERNARD MACDONALD, M.E., Rossland, B.C.
Mr. S. S FOWLER, S.B., Nelson, B.C
Mr. E. NELSON FELL, A.R.S.M., Nelson, B.C.
Dr. W. L. GOODWIN, Kingston, Ont.
Mr. P. KIRKGAARD, Deloro, Ont.
Mr. S. B. WRIGHT, Deloro, Ont.
Mr. CHARLES FERGIE, Westville, N.S.
Mr. J. M. CLARK, Q.C., L.L.B., Toronto.
Dr. A. R. LEDOUX, New York.
Dr. FRANK ADAMS, Montreal.
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Mr. E. B. KIRBY, Rossland.
Mr. A. J. MOXHAM, Sydney, C.B.

Mr. JOHN JOHNSTONE, Glace Bay, C.B.
Prof. W. G. MILLAR, Kington, Ont.
Mr. R. G. McCONNELL, Ottawa, Ont.
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Mr. EUGENE COSTE, M.E., Toronto.
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Mr. E. P. JENNINGS, M.E., Salt Lake City, Utah.
Mr. F. H. MASSON, F.C.S., Halifax.
Mr. J. W. WELLS, Belleville, Ont.
Mr. WM. BLAKEMORE, M.E., Montreal.
Mr. D. W. ROBB. Amherst, N.S.
and others.

SESSIONS AT THREE AND EIGHT P. M. DAILY.

ALL CANADIAN MINING MEN CORDIALLY INVITED TO
BE PRESENT AND TAKE PART IN THE DISCUSSIONS.

Programmes and other particulars may be obtained on application to the Secretary.

S. S. FOWLER,
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B. T. A. BELL,
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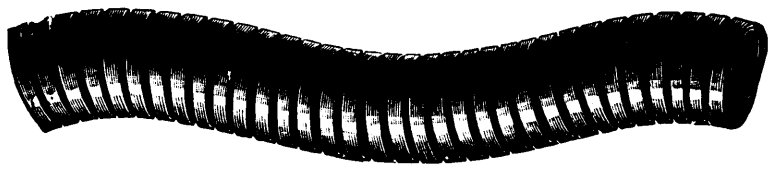

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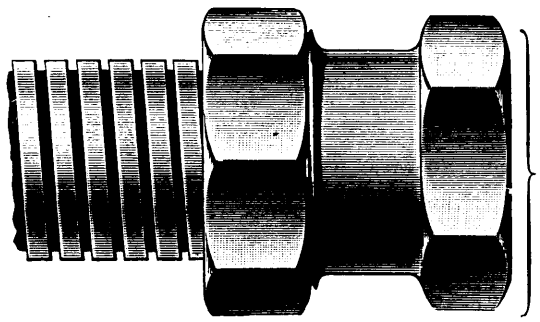

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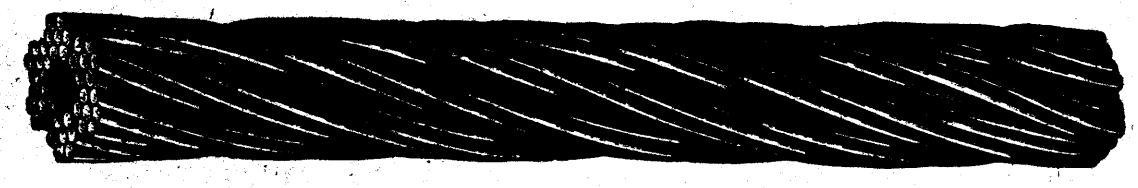

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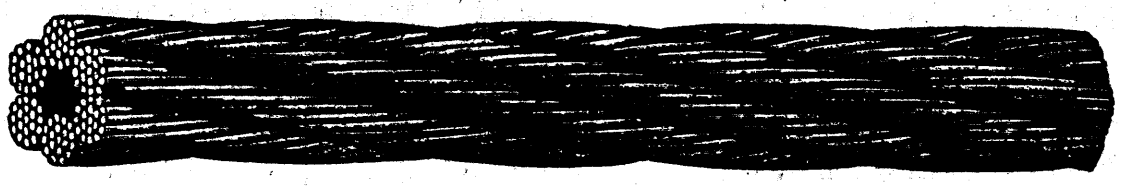

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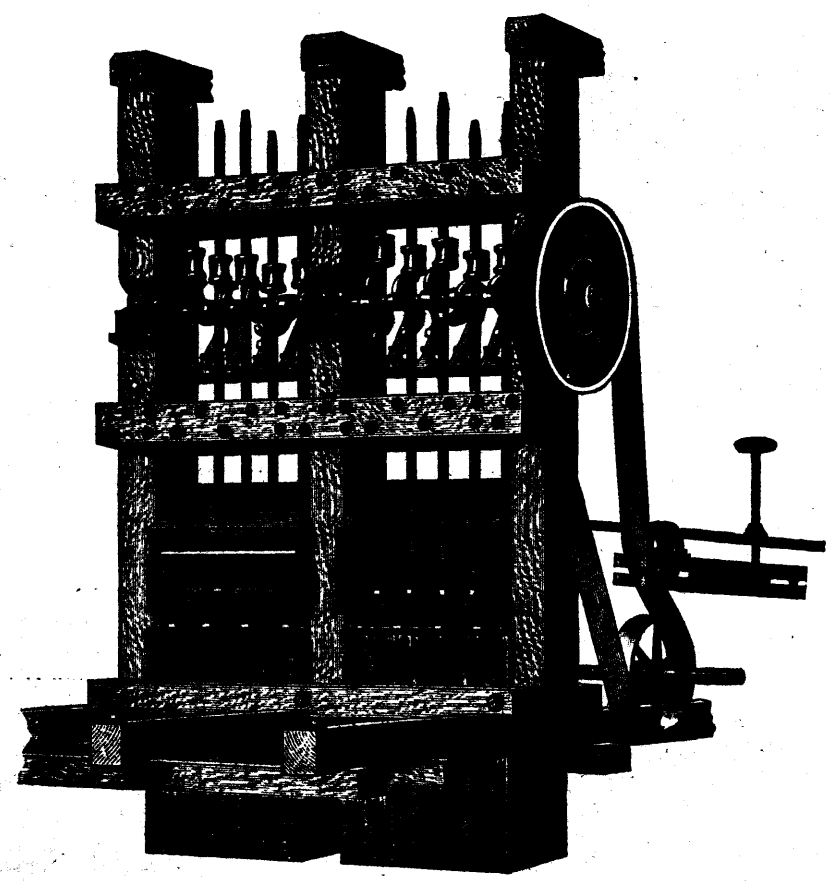

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