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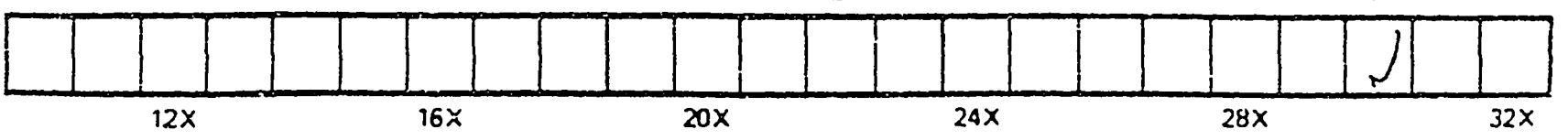

NINETEENTH YEAR OF PUBLICATION

# CANADIAN MINING REVIEW

Established 1882

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19th YEAR OF PUBLICATION.

# The CANADIAN MINING REVIEW

Established 1882

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

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

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## The Nickel Question.

It will be remembered that when the "Act to amend the Mines Act" was passed in the Ontario Legislature in the spring of 1900. it was claimed that by the Hoepfner process actual refining would be in full blast at Hamilton in September, 1900. So far from this being the case, in litigation which has resulted from the operations at Hamilton an affidavit made by Mr. John Patterson has been fyled by the law firm of which the Attorney General is senior partner at Hamilton, in which, referring to the expenditures at Hamilton, Mr. Patterson says that while it is true that there has been expended upon the plant, machinery, and buildings about $150,000, the greater portion of this amount was expended at the instance of the plaintiff (Dr. Carl Hoepfner) upon machinery and plant which is worthless except as scrap. Mr. Patterson refers to the processes, and says that the processes alleged to be covered by the patents referred to are "of no commercial value."

Now that the reason for the passing of the Act by the Ontario Legislature has disappeared, the Ontario Act should be disallowed by the Dominion Government, in the interests of the mining industry.

The Ontario Government recently stated that it was not in the public interests to enforce the Act. This is undoubtedly true, but if it is not in the public interests to enforce the Act then it should not be allowed to continue upon the statute book. Although the objectionable sections have not been brought into force by Order-in-Council, they still operate as a serious menace to investment, and have already done incalculable mischief.

## Another Instance.

We do not single out the Clarendon Mining Company, of Ontario (doing business in Detroit), as being in any respect peculiar in its methods of beguiling the over-credulous investor, but merely as another instance of the familiar gold brick game, as applied in the mining world. The gold brick figures as an ornament on the cover of the prospectus, purporting to be a fac-simile of one shipped by the company to the United States Mint, which shipment is to be repeated many times in the interest of the future stockholders, who are now invited to walk in on the ground floor at the rate of twenty-five cents a share. Now surely this is a most gracious courtesy to the poor public! Here is a company generously offering to share its wealth with any comer for a nominal consideration, when it has a mine with large ore reserves blocked out, showing some $40 per ton, having an idle stamp mill, all erected and ready to grind out gold bricks by the car load, and with conditions so favourable that the costs of mining and milling will not exceed $2.50 per ton! In other words, this company could, on its own showing, grind out $18,000 worth of gold brick in 30 days at a gross cost of $1125. With such an assured profit in view it could borrow $1,125 at ordinary bank rates, pay this back in one month, and have a balance of some $17,863, and yet it prefers to offer stock at a discount of 75 per cent. to obtain working capital. Such prodigal generosity and business imbecility are enough to make one rub his eyes in amazement.

The prospectus affirms that "The Clarendon has passed the experimental stage, and is in shape to show a dividend at an early date." If such be true to-day, it was also true last season, when work was stopped. The mine and mill were then working, and should, according to the figures given, have been paying a net profit of $17,863 per month, on an assumed capacity of 3 tons per stamp per diem, which is a reasonable duty with modern machinery. At this rate the company could have kept a very large force of miners busy on development work, and have laid by a sufficient sum to buy a larger mill at this time, paying cash, and gaining thereby the advantage of all the discounts which ready money will unfailingly command. If the mine could not pay expenses then, how can it expect to do so now? If it was paying, what sort of business men could its owners be to deliberately shut off their source of revenue by closing down?

For the benefit of those who may not know where this wonderful mine is situated, we will explain that it lies in the northern part of Frontenac County, Ontario, about 17 miles from the Clarendon station on the Kingston and Pembroke railroad, in a region possessing some scenic attractions made up of lakes and glaciated rocks. The property has had a more or less checkered career, under various *aliases*, the last of which, before it assumed the name of Clarendon, was the Boerth. It received its first baptism of folly at the hands of one Dr. Eames, whose "new process" monument is shown in all its grandeur in a cut entitled "Clarendon Milling Plant," in the present prospectus. Later, a modern ten-stamp mill was erected, which is a useful adjunct to any mine which can yield free-milling gold quartz. There is a conspicuous outcrop of a quartz vein on the property, which has been prospected to some extent. As to the value of this vein we know nothing. The company's secretary, who also claims to be a mining engineer, and who has also performed the functions of assayer, gives a number of results varying from $16 54 to $181.69 per ton. He records the fineness in several cases as being 980, this remarkable determination having been reached in the course of assays

on samples of ore, instead of bullion! He further states in his "report," "I have never seen such remarkable richness joined to the well-known indications of permanency, with so little development." It would be interesting to know what these indications are, especially in view of his naive confession of small development.

This doughty secretary is included in the prospectus among what are termed "the best mining engineers in the country," concerning which class much is said in terms of commendation. Alas! under what name shall the Mining Engineer take refuge in future? Once the charlatan called himself a mineralogist, then a geologist, and finally a mining expert. Now he parades as a mining engineer!

After all, we blame the pretender less than the public that will subscribe to the stock of a concern which on its very face does not set forth a plain business proposition, which stultifies itself by its own statements, which talks of ore bodies without giving a single measured quantity. Just so long as the public encourages promoters to traffic on its credulity, it can expect nothing better than to be plucked. But all this is unfortunate for those who desire to conduct mining on a proper business basis.

Still another instance of the way in which promoters of mining enterprises seek to gull the small investor is that of the Ash Rapids Company, of Minneapolis, which has been heralding its property in the Lake of the Woods district. In this case the name of a well-known mining engineer, Mr. Charles Brent, was used to inspire confidence, quoting him as commending the enterprise in the highest terms. It turns out that Mr. Brent was never retained to report on this property, and that he did not make the statements imputed to him. It is surely bad enough to defraud the gudgeons, but it is infinitely worse to try to steal the good name of a conscientious engineer. We can only ask with Mark Twain, "I wonder why some things are?"

## Uniform Mining Regulations.

The March issue of *The Labour Gazette* gives a summary of the regulations in force in the various provinces of the Dominion relating to the protection of employees in mines, which shows that the Canadian legislator has been duly zealous for the safety of miners. In fact the regulations are for the most part more stringent than those obtaining in a great majority of the States of the Union, with the exception of Pennsylvania and a few other States where coal is extensively produced. It is singular that stringent legislation of this character has never been made to any extent in the great mining states of the West, Montana being the only one where this matter has received much attention. This has probably been brought about in Montana owing to the treacherous character of a number of its most important mines. It is noticeable, however, that strenuous efforts are being made in Colorado, Utah, and other States to make good their deficiencies in this respect.

Coming now to Canada, we find both British Columbia and Nova Scotia requiring alternative exits from mines, single shafts being prohibited. This is a wise requirement, and it is surprising that Ontario, which has taken a somewhat advanced position in the matter of mining regulations, has not adopted a similar rule. The regulation in the Provinces mentioned seems somewhat defective, however, in the close proximity allowed for the two shafts; the required distance apart in British Columbia being only 10 feet, and in Nova Scotia 45 feet.

In regard to the raising and lowering of men all the provinces require a properly maintained ladderway, and restrict the use of machinery for this purpose within somewhat narrow limits, especially in Ontario, where the provisions for safety are especially complete. Reduced to the fewest words these requirements admit of hoisting or lowering men only in cages or buckets, provided with protecting hoods, working on suitable guides, and only when automatic arrangements to prevent overwinding are employed, in conjunction with hoisting engines provided with double brakes. This is stringent, but reasonable.

Regulations concerning sanitation, ventilation, dressing rooms, refuges in tramroads, signalling, etc., are fairly uniform, but only one Province, Ontario, has adopted a signal code which is made obligatory. This code is the same as that used in Montana, and the extension of the use of this code throughout the Dominion would not be a bad idea. Accidents resulting from confusion of signals are very common, and it is certainly in the interest of safety that miners should find the same set of signals in use wherever they may go. The code in question is exceedingly simple and clear, and is adapted to the use of a mine from its earliest stages as a mere prospect shaft to its extension to any number of levels in depth.

The only other regulation which seems to deserve comment is that dealing with explosives. Nova Scotia and British Columbia both prohibit the storage of explosives underground under any circumstances. Ontario admits of storing a maximum of 100 lbs. of dynamite under suitable conditions on each level. Manitoba allows a quantity to be stored in the mine sufficient for a six days' supply, which is very loose. The Ontario regulation also seems to approach rather closely the danger line. In other respects the Ontario law on this point is excellent, and noteworthy for its minute details, which are merely enforcing what is recognized generally as the best practice.

There has been considerable complaint on the part of many mine managers against the stringency of these regulations, chiefly in Ontario and British Columbia. In some respects the complaints are justifiable, mainly because the regulations require more than was intended. It has been suggested that uniformity in these regulations throughout the Dominion should prove desirable from every point of view, and that if the Canadian Mining Institute, as being a body representing the best mining engineering talent of the country, were appoint a committee to investigate the matter and draw up a set of regulations for safety that would be universally applicable, the Provincial Legislatures might willingly adopt them. The idea seems worthy of consideration.

## The Future for Iron and Steel.

Mr. Edward Atkinson has never, we believe, been accused of pessimism, and he now comes forward, in an article in the *Manufacturers' Record* on the outlook for Iron in the next few years, as an optimist of the most cheerful and reassuring sort. He is a bold prophet who dares to forecast the commercial future of the world for a whole decade, but Mr. Atkinson has done this before and the outcome has justified his prediction. In 1890 he affirmed that the world's production of pig iron in the year 1890 would reach 40,000,000 tons, and the estimates now show that it did reach the enormous figure of 40,500,000 tons. In the meantime one of the most serions periods of commercial depression has been passed through, which perhaps shows the wisdom of prophesying far enough ahead to cover such contingencies.

The calculation is based on normal consumption per capita, combined with normal increase in population. The consumption moreover is subject to a fairly regular rate of increase, to which of course there must be some limit, a point which Mr. Atkinson fails to discuss. In 1890 the consumption in the United States was 350 pounds per capita. At the present rate of increase it will reach 400

pounds by 1902. In Great Britain, France, Germany, and Belgium it amounts to 175 pounds, while for the rest of the world, estimating the iron consuming population at 1,200,000,000, it is only 11 pounds per capita. The consumption in the United States from 1880 to 1890 increased 10 pounds per capita per annum, so that it is evident that the increment is a decreasing one. On the other hand the rate is increasing in Russia, and in other parts of the world where rapid growth, out of what may be called pioneer conditions, is taking place. These factors, however, are neglected in Mr. Atkinson's estimate, which is made on the basis of present consumption, increased by growth of population. Accordingly Mr. Atkinson puts the probable consumption of pig iron in 1910 at 60,000,000 tons.

Concerning Canada he says: "The recent opening of vast deposits of rich steel ores in the maritime provinces of Canada close to deep water, may enable Great Britain to keep in line, but as these deposits are adjacent to abundant deposits of coking coal and limestone, perhaps British iron and steel works may have to be in part removed to this continent in order to continue." Viewing the situation on the North American continent more broadly he affirms that "the United States must supply the greater part of this increase (in the world's output), and if common sense prevails, leading to the enactment of a reciprocity treaty with Canada, or yet more, if all duties are presently removed from the import of ores from Cuba and Canada and of old scrap iron and steel from all parts of the world, the iron and steel industries of the Atlantic coast will soon be unable to supply the export demand, and the iron furnaces and steel plants in the interior will soon be unable to supply the domestic demand."

Mr. Atkinson takes an equally cheerful view of the trust problem as it affects the iron trade, declaring that "no combination can corner the steel of the world, however powerful." This, we aver, remains to be seen.

Mr. J. Stephen Jeans, of the London Iron and Coal Trades Review, reaches very different conclusions concerning the case. Pointing out that the present high production denotes a natural result of phenomenally good times, beginning in 1897, and that the capacity to produce has been increased during the last four years at a rate out of all proportion to any normal increase in consumption extending over a considerable period of time, he anticipates speedy over production, and consequent changes in the aspect of the iron and steel market. He objects to taking the rate of increase of consumption as indicated by output during periods of boom, but assumes as a safer basis of calculation the normal increase during periods of depression. There is a good deal in the difference of one's point of view. Mr. Jeans would look ahead in the light of the conditions obtaining from 1889-96 when the total increase of pig iron production throughout the world only amounted to 3,500,000 tons, or little more than half the increase that is being provided for by the furnaces building or rebuilding at the present moment. We incline to Mr. Atkinson's reasoning, as being unassailable in regard to normal rates of increase, with this difference that the total production through any given period, say a decade, should be taken as the ground on which to arrive at the true increase. The point is that the consumption is not likely to be steady at the rate Mr. Atkinson assumed through the coming decade, and productive capacity, taxed at intervals to keep pace with the demand, will be excessive during a portion of the time.

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President Libbey of the Mining Society of Nova Scotia is to be congratulated on his out-spoken condemnation of fake mining industries down by the sea.

## Dawson & Selwyn Memorial Portraits.

In recognition of the invaluable services rendered towards the development of the mineral wealth of Canada by the late Dr. George M. Dawson and his predecessor, Dr. A. R. C. Selwyn, late Directors of the Geological and Natural History Survey of Canada, the Canadian Mining Institute invites subscriptions from the Canadian mining public towards its fund, for the purpose of presenting suitable portrait paintings of the late Directors to the Museum of the Survey with which their life work has been so prominently identified. Remittances marked "Dawson and Selwyn Memorial Portraits" should be sent to the Treasurer of the Canadian Mining Institute, Mr. J. Stevenson Brown, Temple Building Montreal, or to the undersigned. All subscriptions will be acknowledged in these columns. The following amounts have been subscribed to date:—

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

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## Encouraging Good Roads.

A novel and practical plan has recently been adopted by the Illinois Central Railroad, which must have important results in increasing at one and the same time the industrial prosperity of the communities tributary to this line, and the carrying trade of the railroad itself. A so called "good roads train" is to be started from New Orleans, and to work its way gradually from point to point to Chicago. The equipment of this train will consist of the following: One car carrying a stationary engine, rock crusher, elevator, and screen; one car carrying a road roller, road machine, plows, and scrapers; two gondolas for transferring stone, sewer pipe, etc.; one car for coal, and carrying a water tank, one business car, with commissary to supply two government engineers, one representative of the National Good Roads Association, and two skilled operators for the machinery; and one road department boarding car, with six laborers.

The purpose of the "good roads train" is to give practical illustration of the best means for making a passable highway, with the materials available on the spot. At each point a roadway will be built for a distance of from a half of a mile to one mile from the railroad station. Co-operation on the part of the inhabitants of the district will be sought. Interest in the work will be promoted through the action of local boards of trade and other commercial organizations, and conventions will be called through these associations to discuss the good roads movement at each place where a sample road will be constructed.

This opens up a whole new field of endeavor for railroad companies, for the same idea could be carried farther than in the building of highways. Even within these limits, every trunk line might create

an interest in facilitating less expensive transportation from the surrounding country to its stations. A good beginning might be made in building good roads in the immediate vicinity of the stations, where the conditions are often worse than on the highways themselves. This movement is of value not only to the farming class, but would soon show its effect on many branches of the mineral industry, such as quarrying, brick and tile making, lime production, gypsum, etc. There are many places in Canada where such industries would arise but for the condition of the roads, which limit hauling to the season when "sleighing" is possible. Here is an opportunity for the Canadian Pacific and Grand Trunk Railways.

### Algoma Mining Freaks.

I was engaged as assayer, some years ago, by a Canadian Company who were operating on the North Shore of Lake Superior. The Manager, a school teacher of years and experience, was driving a tunnel into a granite hill. The tunnel was lower at the breast than at the mouth, and as one shift only was worked there was an accumulation of several feet of water during the night. I have a very vivid remembrance of all hands and the cook packing water out of that tunnel every morning. I ventured to suggest a hand pump. The Manager looked at me askance as if he thought I was infringing on his prerogative and making myself officious. After a lapse of several days Mr. Manager announced that he had sent for a pump and that it would arrive at the station that evening. I was ordered to go after it, and on asking for some men to help me carry it to the boat was informed that I could carry it myself. I went off, full of anticipation, which was more than satisfied when I saw the pump. It was a good sized syringe, intended for spraying fruit trees or bailing out a boat The comments of the "Cousin Jacks" when I appeared at the mine with the pump over my shoulder it would not be proper to reproduce in this paper. I may state that the Company spent $25,000, have two tunnels aggregating 180 feet in length, shipped the whole of the high grade ore to the home office in two cigar boxes, attempted to ship several tons of lower grade in an ancient barge, caulked with rags and blue clay, which promptly went to the bottom in spite of the heroic efforts of the "Cousin Jacks," who swam ashore. "A complete assay outfit" had been purchased, according to the prospectus of the Company. I found this to consist of two plumbago crucibles, one muffle, Battersea, size F, a pair of apothecaries' pocket scales with pans of horn and string suspension, and a set of apothecaries' weights. This Company "went broke," and you couldn't get a cent for mining in Algoma from any of them or any of their frienus or associates. They say the country is no good. Do you wonder?

Some years later I was assayer at one of the noted silver mines of Algoma. There was in the mill yard a unique collection of rusty scrap-iron, the cast-off devices for silver extraction thrown aside during the evolution of the mill. This mill was a law unto itself; the processes of natural selection and survival of the fittest were allowed to go on by the manager in all their native beauty, untrammeled by any of the lessons of experience. The result was a machinery museum in which one could see something new every day, driven by a fire-eater of an engine that achieved the distinction of clearing more land than anything of the h.p. ever invented before. I remember on one occasion remonstrating with the new mill superintendent, a supposed "cracker jack" from Colorado, when the tailings soared ounces above the headings, he called me on one side and informed me that he had never seen a silver mill before. I admired his candor, aud as he was a decent fellow, the extraction as returned to the office was not so bad as it might have been. This mine extracted half a million ounces in five years and finished up "in the hole." I heard one of the stock holders of this mine, only the other day, strongly advising one of his friends not to put any money into Algoma mines. Do you wonder? While employed at this mine I used to wander once in a while to a neighbouring mine that was noted for the number of "nuggets" of Argentite or "black silver" found in the veins (I saw one mass of 40 lbs). I sauntered into the blacksmith shop one day, and saw the manager preparing to melt some "nuggets" in a babbit ladle. I was immediately interested. The ladle was well filled with several pounds of argentite, the helper blew the fire lustily, the mass started to melt, and—there was no bottom in the ladle, and the forge became, for a foot or two in depth, highly argentiferous. There was some profanity, but after things had cooled off a little I suggested trying the experiment in a black lead crucible, mixing the remainder of the argentite, which was mostly dust and small fragments, with some charcoal and nitre. It was a big thick pot, and nothing happened at first, but as soon as it got warm I saw something attractive outside. There was a sharp report a moment later, my very fair substitute for gunpowder had gone off, the blacksmith and his helper were full of coke and plumbago, and the manager was in the blacksmith's tempering tub, digesting his second lesson in the metallurgy of silver. This mine put up a "saw mill" for a stamp mill, extracted 350,000 ounces in two years, and ended up in the hole, leaving the working men with six months' arrears of wages. Why?

Not many years ago I was engaged to superintend a new gold mill in Algoma. This mill, a few weeks previous to my engagement, was reported on, for a consideration, by one of the best known *military* metallurgists of the district, and pronounced a first-class plant for the extraction of gold and silver values from the ores of the country. The stock holders were much elated, and looked forward with fond anticipation to the 50 per cent. dividends promised them by the promoters of the scheme. Let me describe briefly my first visit. It was a cold winter's day, the building was built of rough lumber covered with corrugated iron, the heating arrangement an occasional whiff of warm air from the boiler room, the temperature a little above freezing. There were two crushers, each of unknown species; one was running merrily and was being "fed with a spoon." The other was idle and carried on its pitman a block of ice as much as a man could lift. The place was full of dust, but as I wanted to get an insight into the ice business I waited. In a few moments the crusher man felt the bearings of his busy machine, hastily threw off the belt, changed the block of ice from No. 1 to No. 2, started up No. 1, and all went merry as a marriage bell, until the next time. The ore, after being crushed, was elevated 40 feet and then allowed to run back to the floor on which the crushers were situated, whence it was fed by hand to a pair of pulverizers which were doing their best to grind themselves to pieces on the exceedingly hard quartz with which they were being fed. The machines were, without exception, the best contrivances for grinding iron by means of quartz I have ever seen. When I tell you that the normal wear was between three and four pounds per ton of quartz you will see that I am not exaggerating. The pulverizers were wet grinders, and the pulp, on issuing from the screens, passed over a series of cast iron riffles set in a sheet iron trough. All the gold saved in the mill was caught in the first two feet of these riffles, and more than 50 per cent of the values were allowed to escape. The tailings ran into four large grinding pans, followed by two agitators and a pair of eight foot settlers. All of these were whirling around without a pound of mercury in them, doing no work, their uses unknown to anyone in the mill, driven by a huge fire-eater of an engine using seven cords of wood per 24 hours. The average

crushing was 5 tons per day. A large reverberatory, the roof of which fell in the first time it was fired, and a colossal retort, capable of handling all the amalgam in Canada, were prominent features of this unique plant, which, after various vicissitudes, stands idle to-day, a monument to the gullibility of the public and the success of a pair of unscrupulous fakirs.

The crying need of this section of the country is a school of mines that will turn out trained men who will not need to complete their education at the expense of their employers. We have a country of marvellous resources, the development of which is being severely retarded by the gross incompetence and fakirism of the men who have been in charge of many of our mining ventures. The public need to be educated to the fact that miners and metallurgists are not born, but made, and that it is unsafe to entrust the management of a mine to a man who often possesses no other qualification than a relationship to some of the directors

Would a trained man drive a tunnel 400 feet into a hillside to attain a depth of 30 feet, or, having a good natural slope for a mill site, deliberately dig a cellar and put his mill into it endwise? Would a sensible man sink a prospecting shaft 12 feet by 16 feet, or put up a mill on the top of a hill where there never is any water except when it rains, or place it in a swamp so low that the tailings flood the wheelpit of his engine three weeks after starting? Would any man possessing ordinary common-sense spend thousands of dollars sinking shafts on the indications of a divining rod, or build a first-class stamp mill and three miles of railroad without one foot of development on the mine? What would you think of an assayer who makes "Fire" assays, "fires the samples out of the window," and coolly writes out his certificate of assay, or who finds gold values in brick-dust, rock-salt, blue clay, or "any old thing"? A good many thousands of dollars were spent recently in our country on extensive borings in blue clay at the bottom of a lake, all on the strength of results of "Fake" assays. What do you think of a mining engineer, who on the strength of a couple of examinations condemns a whole district and says it is no good? A mining engineer possessed of common sense, divides the properties in any country into two classes, those he has examined and those he has not examined. If he has examined a property, his examination and report is the property of someone who has paid him for his work, and he has no right to open his mouth about the matter. If he has not examined a property he knows nothing about it and can say nothing. A man came into my office some time ago with a new cyanide process. He proposed to boil the crushed rock with cyanide and some special dope he had invented. He wanted to have the use of my laboratory for his experiments. I recommended him to experiment in a kitchen, and advised him to boil his rock with red cabbage before treating with cyanide. I told him I thought he would get a better extraction. He thanked me, but would not speak to me next day. I have before me an adver isement of an Algoma mine, which states that a shaft 100 feet deep with a cross-cut 100 feet long at the bottom exposes 1,500,000 tons of ore! I should think it exposed the ignorance of the writer. Another concern professes to have a shaft 300 feet deep, and in their advertisement say "Remember we have ore enough to keep fifty 40-stamp mills pounding out gold continuously, not only during the lifetime of our youngest stockholder, but during the lifetime of his childrens' children." This is equal to the speech made by another of our managers to his stockholders in London. He mentions nothing less than 30dwt. ore, but admits that some runs 12½ozs. He is glad that a new issue of stock is being made, so that he and his assistants may have a chance of investing and of "Putting up our hard sovereigns with yours," as he enthusiastically threatens to do. I hope that other sanguiue gentlemen may have better luck than this last one, who shut down his mine a couple of months after making his bluff.

In concluding this paper, which is made up mostly of chaff, but which may afford some kernels of truth on reading between the lines, I desire to protest against the dishonesty and incompetence that have been the cause of so many failures in mining in our country. There is enough natural risk in mining to satisfy the ordinary desire of the votaries of chance, and we must eliminate tha ignorance and charlatanry too common in this country before we can hope to place mining on the business basis it should occupy.

Rat Portage. CHARLES BRENT.

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## The Kingston School of Mining.

By COURTENAY DE KALB, KINGSTON, ONT.

In view of the important improvements which have been made in the equipment of the Kingston School of Mining during the past year, and of the extensive additions which are to be made to its facilities before the opening of the session of 1901-02, it seems fitting to make more widely known the advantages which this institution is able to offer in the education of engineers. While primarily a mining school, it has developed courses leading to the degree of B. S. in other branches of engineering, which will in future be given greater prominence, since the new buildings and their equipment will admit of adequate training in mechanical and electrical engineering, chemistry, and geology. Considerable stress has been laid on these two latter courses in the past, but the mechanical and electrical departments have not hitherto been so well sustained on the side of laboratory instruction for want of space and suitable apparatus. This deficiency will now be made good.

A laboratory for the department of mining and metallurgy was erected a number of years ago, and was fairly well equipped. But within the past year this building has been enlarged to three times its original size, and the milling plant has been completely remodelled, receiving additions of machinery which make it one of the best of its kind in North America. It is important to observe, furthermore, that all the appliances for ore treatment are of sizes recognized as standard in practical work. No laboratory models are employed in this department. The usage in technical schools varies greatly in this respect. Some, following the example of the Massachusetts Institute of Technology, employ machines of small size, whose avowed purpose is to illustrate principles only. Others combine models with some appliances of full working size. Very few have adopted the policy pursued at Kingston of using only standard sizes throughout. It is true that a student can not be given a training which will be the equivalent of practical experience by even the best ordered laboratory instruction, but so far as this instruction goes it should yield results which will give a correct idea of what might be obtained on a commercial scale. Wrong impressions obtained in laboratory work are difficult to overcome later on, and toy machines certainly do produce erroneous conceptions because they seldom can be made to perform a duty which is the equivalent, even in character, of that yielded by machinery where proper proportions exist.

For example, a small stamp mill never will give results which can be duplicated on a large scale. The proper relations between weight of stamps, size of mortar, height of discharge, quantity of water, etc., are of vital consequence, and such relations are impossible to establish in a 3 stamp mill with light stamps, such as are commonly used in milling laboratories. Recognizing these facts, the School of Mining has adopted the policy of using standard equipment for practical instruction in milling methods. Small lecture room table models are

used to some extent, however, to illustrate principles, these being intended to represent concentration of ores under more nearly ideal conditions than are attainable by practical working machines.

The completeness of the equipment of the milling laboratoty will appear from the following list of appliances now installed: One 7 in. x 12 in. Blake Crusher, one pair of 12 in. x 7 in. rolls, one No. O. Krupp ball mill, one 12 inch cone grinder, one 5 stamp mill, with 850 lbs. stamps, one Frenier spiral sand pump for elevating sands, one No. 2 Heald and Sisco centrifugal pump connected to an agitator tank, one 17 ft. Wilfley concentrator, one 4 ft. x 12 ft. Frue vanner, one 3 compartment Hartz jig, one 2 compartment Evans jig, one 16 ft. revolving buddle. 4 different types of hydraulic classifiers, one 3 compartment spitz kasten, one Wetherill Magnetic separator, one 10 inch centrifugal machine for slime treatment in cyaniding gold ores, one Johnson filter press for the same purpose, a cyanide leaching plant to treat 1,000 lbs. at a charge, a barrel chlorination plant for gold ores capable of treating 500 lbs. of ore, with a reverberatory furnace for roasting the ore, an automatic sampler, and a chemical laboratory for determining the results obtained in milling. There are also various types of rock drills, air compressor, etc.

It should be stated also that the School of Mining, as an encouragement to the adoption of suitable methods in ore treatment, will make tests for process in its milling plant for any parties in Canada at costs intended merely to cover the actual outlay incurred in crushing and treating the ore. In cases where the material may prove suitable for laboratory instruction the School will take its pay for such services in ore instead of money.

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## The Duty of Stamp Mills in Crushing and Amalgamation.

By COURTENAY DE KALB, M.E., KINGSTON, ONT.

[Paper read before the March meetings of the Canadian Mining Institute.]

It is with reluctance that I venture to speak upon this important subject, for which I am not aware of possessing any special fitness. I enter the field only upon the solicitation of our Secretary, in the hope that I may stimulate others to offer the fruits of their experience in discussion. I have used the stamp mill on a large variety of ores, crushing for amalgamation, for amalgamation and concentration, and for cyaniding without amalgamation. The latter I have come to regard as ordinarily of very doubtful expediency, to say the least, for I do not think anyone will maintain that the stamp mill is an economical crushing device. There may be exceptions to this, however. For example, sectional machinery for crushing is not usually satisfactory. This applies to rolls, Huntington mills, and other roller mills, of large capacity. The smaller sizes are less difficult to keep in repair, but their consumption of power is large in proportion to the work done. Sectional stamp-mills, on the other hand, are eminently successful, accordingly they would be justifiable for crushing for cyaniding in a remote district where heavy pieces of machinery could not be transported. Again, crushing in rolls is most efficiently done on dry ores, unless the ores are singularly free from aluminous or sericitic matter. If the ores were very wet it might prove too expensive to dry them. It rarely pays to dry ores when extra fuel must be burnt for that purpose. If it cannot be done by waste gases from the boilers, then it will in all probability have to be abandoned. Here, then, is an argument for using the stamp-mill merely as a crusher. In passing I may add that crushing finer than one millimetre (about No. 16 mesh) in rolls is not economically possible. Hence, in crushing for cyaniding, the crushed product must be sorted in hydraulic classifiers, the first spigot discharge being then reground in some other type of mill. For this purpose I have found either the Huntington or the ball mill suitable.

The tendency of the stamp mill is to make an excessive quantity of fines. Under ordinary working conditions the percentage of the total ore fed which will be crushed finer than No. 100 mesh will vary between 28 per cent and 40 per cent. I have found about 32 per cent to be near the average. All that prevents the production of a larger proportion of fines is the masking of the blow upon the smaller particles by the crushing of the larger particles on the die. I am inclined to believe that very nearly all the fines are produced in the crushing of the larger particles, those which rest upon the die and protrude above the general mass of ore upon it, especially where low discharge is employed. It may not be commonly known that the crushing in a stamp mill is accomplished mainly by the reaction from the die after the stamp has fallen. If a stamp is allowed to fall upon a single lump of ore resting upon the die it will be found that the upper portion of the lump will have been merely fractured, while a considerable proportion of the lump adjacent to the die will have been reduced to powder. The force of the blow has developed spherical waves in the ore particle, which traverse it until they meet with resistance from the die. They are then reflected backward, meeting succeeding on-coming waves, the result of which is to overcome the cohesion of the mass, comminuting the lower portion of the lump. Further experimentation will be necessary to determine the other conditions under which crushing is accomplished in the stamp-mill, but the statement I have made has, at least, been demonstrated by careful tests in the laboratory of the School of Mining. So far as it goes it leads to two conclusions regarding crushing for high capacity, viz., the feed should be kept thin, and the crushed material should be hurried out of the mortar as rapidly as possible. This is only affirming on theoretic grounds what has long been practically recognized and applied in California, and in other places where high amalgamating capacity and high crushing capacity were compatible. Nevertheless, there is a tendency even in California to overfeed the battery in a desire to put through a large amount of ore, and I think that this error on the part of millmen is too general everywhere. To be sure, it is an economic question, to be determined independently in every mill, but it is very easy to err on the side of high capacity at the cost of reduced inside amalgamation. Mr. Dana Harmon, in a very suggestive paper on the Stamp Milling of Free Gold Ores, read before the Technical Society of the Pacific Coast (Sept. 7, 1900), affirms that if the ore is one that will yield its values in amalgamation, at least 60 per cent. of the gold should be caught in the mortar. This would not be altogether an unsafe rule for the millman, though I should modify it so far as to claim that 60 per cent. of the amalgamable gold should not be allowed to escape through the screen.

I have observed a marked tendency to discard inside copper plates in the West, and many of the best superintendents no longer attempt to use plates on the chuck blocks. When a low discharge is used the scour is undoubtedly excessive, and any amalgam that may have formed on them is necessarily washed out with the pulp, which is difficult to save. Fine particles of amalgam will escape from the ordinary mercury traps, and while outside plates will catch fine gold they accomplish very little, if anything, in arresting amalgam that may have issued from the mortar. I have used with success in narrow mortars, back plates with protecting cast iron shields so placed as to leave a space about one-eighth of an inch wide between the copper plate and the shield on the upper edge, and one-quarter of an inch wide on the lower edge. The pulp washes up between the two plates and over the shield, and on the return flow a portion of that which washed over the shield also passes between the shield and the copper plate.

Amalgamation is thus facilitated, and scour is prevented. In setting back plates, they should always be placed so that the upper edge of the plate is higher than the normal rise of the pulp wave, and my experience has been that the greater amount of amalgam will be found in a band approximately coinciding with the upper limit of the rise of the wave. It is merely a question of time of contact, admitting of nnion between the gold and the mercury. For the same reason I prefer multiple apron plates, each plate not more than 2 ft. long, and successively overlapping each other, so that the pulp in falling from one to the other may have a better opportunity for prolonged contact, with the mercuiy under each recess thus formed. Time is all important in amalgamation, and many millmen do not provide the proper conditions in this respect for perfect extraction of the gold. A very common fault is that of using too much water, so that the pulp is swept too rapidly over the apron plates. As thin a stream of pulp should be obtained as will flow smoothly and freely over the plate, maintaining the crescent wave which is one of the indications of proper distribution of the pulp. Every effort should be made to save the gold by amalgamation, and no reliance should be placed upon the concentrators for this purpose. If any amalgamable gold large enough to be caught in the mortars and on the plates is saved on the concentrators, it is a sure indication that the milling conditions need modification.

I wish to insist upon the importance of a careful study of the pulp, which should be made with every ore, and at intervals of a few months with the same ore, unless the tailings assays show that the best possible results are being constantly obtained. For this purpose, after a "clean-up," before adding any mercury, ore should be crushed in an ore battery until normal conditions are established, taking care to feed a good average of the regular ore milled, and then the whole pulp stream should be saved until several barrels are filled. Allow this sample to settle, siphon off the clear water, and dry the residue. Weigh, and screen through a series of sieves beginning with a size slightly larger than that of the rated size of mesh in the battery screen, and carried down as fine as No. 150 mesh, or even to No. 200 mesh. Weigh these several products and calculate to percentages for plotting a sizing curve, which will show graphically just what quality of crushing your mill is doing. Divide each one of these products into two portions, mixing as for sampling and combining opposite quarters, and assay one of these portions corresponding to each size of screen mesh. The other portions should be tested as to the amount of amalgamable gold they contain by pan amalgamation, and the residues then concentrated on a vanning plaque. After assaying all products the results can also be plotted for convenience. when, if the experimenter were careful, the whole story should appear. Comparative tests or this sort, made upon pulp obtained after varying the milling conditions, will readily show the way to secure the most perfect work possible in both amalgamation and concentration. In no other way may one so speedily and surely determine what adjustments to make as regards height of drop and discharge, size of screen, and quantity of water needed, and an effort to reach the same end by merely varying the milling conditions and assaying the tailings will take a longer time, involve losses that need not have occurred, and finally yield only an appoximation to the accuracy which may be reached by such a searching investigation as that outlined above.

The question of fine breaking of the ore before feeding to the stamp mill has received so much attention in late years that some mention must be made of this innovation. Like most good things, it has been abused by unthinking men, whose aim has been to cheaply crush a large amount of ore. When the gold in the ore exists in the free slate, by which I mean that it is not locked mechanically or otherwise in the sulphides, and when the amount of coarse gold is large, there is no doubt that the results are highly economical. Since the stamp mill is not an economical crusher, the less work of this sort that we exact of it, while securing the best possible results in amalgamation, the better. Furthermore, the coarser the material fed the less duty is the mill performing, and also the splash is affected to some extent, which has a direct influence upon amalgamation. The main question is that of time for complete amalgamation. The finer the ore fed the more rapidly will it pass through the mortar. This may be corrected by increasing the height of discharge, or by using roomier mortars. The economic gain in crushing is then lost, however, and the only benefit, if there be any, is to be looked for in superior amalgamation due to more prolonged retention of ore in a finer state of sub-division in the mortar.

The weight and speed of stamps is a point regarding which there is little agreement in opinions. So far as crushing efficiency is concerned there is little difference between the two, within the limits of weights which may be regarded as standard today, viz, 850 lbs. and 1100 lbs.; that is to say, the difference in speed bringing the output per horse-power expended to practically the same point. So far as I have observed the choice depends upon the character of the ore, the lighter stamp producing enough less violent splash to facilitate the amalgamation in the mortar of more fine gold, when the height of discharge in the two cases remains the same. A very slight modification in the height of discharge, however, will give to the heavier stamp the same advantage. Any material difference between light and heavy stamps is to be looked for in the wear and tear of the mill, the abrasion of shoes and dies per unit of ore crushed, and the relative weights of metal thrown on the scrap heap in the form of worn out shoes and dies. On this important point I have no certain data on which to base conclusions. The experience of millmen with regard to this would be of great value.

I wish to commend Mr. Harmon for his protest against the use of potassium cyanide solution for brushing and brightening the plates. Prudently used it may do no harm, but I have known many mills in which important losses of amalgam undoubtedly occurred from the too frequent application of this chemical. A solution of caustic soda, or lye from the leaching of wood ashes, will cleanse plates perfectly; they are not solvents for gold, and incidentally they are free from the poisonous quality of KCN.

In this brief, sketchy paper, I have not attempted to do more than throw out a few suggestions on important points, merely as a basis for discussion, without any pretence of adding new knowledge, and certainly I shall not attempt to lay down any rules concerning the duty of stamp mills. This matter is relative, dependent upon so many varying circumstances, that the only guide for the millman is to study his pulp often and critically, so that he may know, and not guess, when he has obtained the combination of highest crushing capacity with the highest amalgamable capacity, adjusted to the line of the highest economical results. It is not easy to do this, not nearly so easy as most men may think, and a man must possess the peculiar qualities of the experimenter—in other words he must know something of scientific methods of analysis—in order to be sure that he has attained the result at which he is aiming.

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RESIGNATION OF MR. DONKIN.—Mr. Hiram Donkin, C. E., for many years resident manager of the Dominion Coal Company Syndicate, has resigned, and Mr. Christopher Shields, of Bristol, Va., general manager of the Virginia Coal and Iron Company, has been appointed to succeed him.

## Notes on the Oregon Nickel Prospects.

By Dr A. R. Ledoux, New York.

[Paper read at the Meetings of the Canadian Mining Institute, March 7th.]

Nickel, like tin, is a metal found everywhere in the United States, but mined nowhere in any quantity to-day. It is associated with chrome-iron ores in many of the northern States; with sulphides in Connecticut, New York, New Jersey, and notably in the formerly prosperous mines of Lancaster Gap, Pennsylvania.

For years nearly all the nickel produced at this latter mine was bought by the United States Government for coinage purposes, but to Mr. Joseph Wharton we owe the demonstration of how large a number of useful articles can be made from the pure, unalloyed nickel. The commencement of the age of manufactured nickel dates from Mr. Wharton's exhibit at the World's Fair in Vienna in 1873.

Since the practical exhaustion of the ores of Pennsylvania, and the discovery of the great beds of Sudbury, the United States has been relying on the Canadian product for its nickel. In the beginning the copper nickel mattes of Sudbury were sold to different buyers, principally in Europe. The owners in the meanwhile expended very large sums of money to discover a process commercially efficient by which the mattes could be refined and the nickel separated either in Canada or elsewhere on this continent. It was not until the successful experiments of Col. Robert M. Thompson, of the Orford Copper Company, that the Canadian nickel found a ready market throughout the world in competition with the powerful nickel syndicate controlling the principal mines of New Caledonia. I observe in the statistics published by the Canadian Mining Review, in March, 1901, that Canada or New Caledonia each produced approximately 3,700 metric tons of nickel in the year 1900

The pyrrhotites of Sudbury have been well described by members of the Canadian Mining Institute, but it has occurred to me that it would be interesting for you to hear something of the Oregon deposits, about which much was written from the political and speculative standpoints a few years since:

These deposits occur upon what is known as Big Piney Mountain, situated near the Southern Pacific Railway in Douglas County, Oregon, some 235 miles south of Portland. The nearest town is Riddles, consisting of some 50 to 100 buildings with stores, hotel, etc., lying in a beautiful green valley everywhere fertile and blest with the moist temperate climate of the Northern Pacific Coast States,—living being very cheap. During the greater part of the year considerable rain falls, but snow does not lie for any length of time excepting upon the summits of the mountains.

The range to which Big Piney Mountain belongs is an isolated cordillera, lying between the Cascade Mountains on the east and the Coast Range on the west. This particular hill rises sharply to the west of the Railroad at Riddles, attaining an elevation of some 3,600 feet above the sea. The nickel ore occurs near the summit of the hill, and for some 2,500 feet below the summit forming a mantle which covers the southerly and easterly slopes. The foot-hills are largely wooded with pine, cedar, and fir. In the valleys are oaks, ash, maple, etc. The ownership of the numerous claims which have been located, is divided between two corporations, neither of them operating at the time of my visit in 1900.

It is well known that there are three principal types of nickel ores. The sulphides have already been mentioned. There are Arsenides, such as are found in considerable quantities in Nevada and elsewhere, but from the silicates which occur in New Caledonia half the nickel of the world is produced.

The ores of Oregon belong to the same type, and in appearance and occurrence resemble closely the New Caledonian. The comparative composition of the Oregon and New Caledonian Ores is shown in Dana's Mineralogy as follows:—

| | $SiO_2$ | NiO | NgO | $H_2O$ | $Al_2O_3$, $Fe_2O_3$ |
|---|---|---|---|---|---|
| New Caledonia.. | 37.78 p.c. | 33.91 p.c. | 10.66 p.c. | 15.83 p.c. | 1.57 p.c. |
| " " .. | 35.45 p.c. | 45.15 p.c. | 2.47 p.c. | 15.55 p.c. | 0.50 p.c. |
| Oregon ..... | 40.55 p.c | 29.66 p.c | 21.70 p.c. | 7.00 p.c. | 1.33 p.c. |
| " ..... | 44.73 p.c. | 27.57 p.c. | 10.56 p.c. | 15.86 p.c. | 1.18 p.c. |

The Geological relations of these deposits to the country rock is thoroughly demonstrated by the amount and character of work which has been done in the vicinity, and may be outlined, untechnically, as follows:—

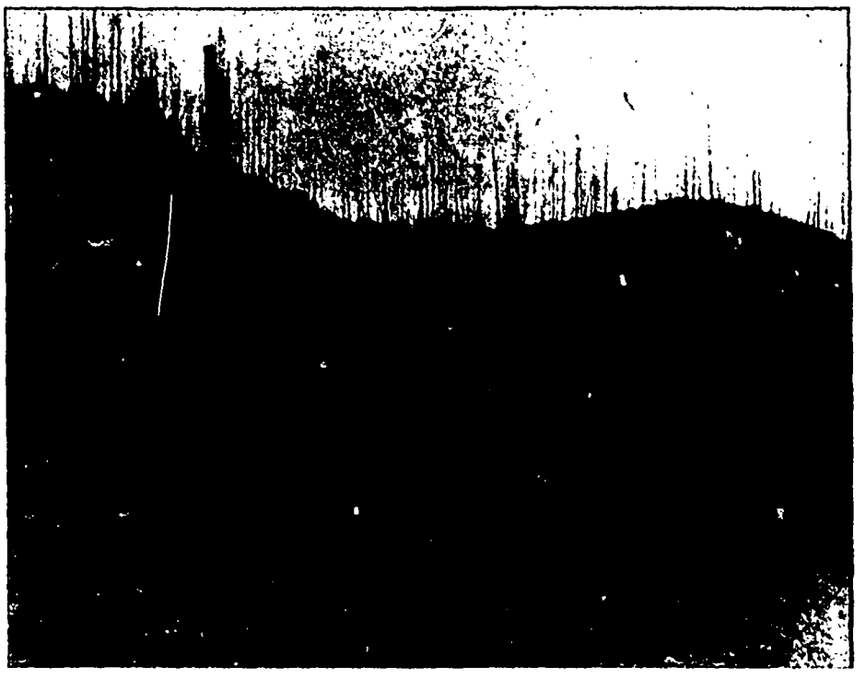
Overlying the granites and the older limestones and other stratified rocks are beds of coarse igneous breccia, not only the cementing mass but its ingredients being of igneous origin. Up through and overflowing these conglomerates has been an eruption of peridotyte. This rock contains as its universal constituent the mineral olivine, which has nickel for one of its components. It is probable that the whole mountain mass of Old Piney, at least on the southern and eastern sides would average 0.25 per cent. of nickel. The abundance of rainfall and other oxydizing influences have thoroughly altered the surface of this peridotyte, not only by oxidation but by replacement until an area of several square miles has become covered by a layer varying from a few inches to twenty feet, and probably averaging ten feet thick, of what might be called a gossan of porous, soft serpentine, full of cavities and looking not unlike a coarse coral. The sepentine matrix often shades off into silica, occurring in bands and veinlets, frequently appearing as Chalcedony. Cavities in this porous rock and some of the veinlets have become filled in part with chrome-iron ore, iron oxides and the nickel silicate. After the rock has dried, the iron oxides and nickel compounds are readily shaken out as dust if two pieces of ore are struck together, or if the mass is struck by a hammer, or shattered by a blast.

It is obvious at a glance that the nickel in the peridotyte has been concentrated in the process of alteration, which alteration, as stated, may extend from a few inches to twenty feet in depth. It is interesting to know that there is still going on a concentration or segregation of nickel in dumps which were formed a few years ago, during the progress of prospecting. On digging through one of those I found a distinctly banded structure to the dump and a stratum of excellent ore in a band three inches thick, lying immediately upon an impervious bed of iron clay which had also been leached out of the ore above, thus forming an impervious bed upon which the nickel ore rested.

As to the extent of the deposit, it would be very conservative to consider it to be a layer of ten feet thick, and covering a square mile. It is one of the few places where both development and outgrowth justify the promoter's pet phrase of "millions of tons in sight." The development has been abandoned. There are probably one hundred openings, either tunnels, pits, or shafts scattered over the entire area of nickel-bearing ground. These openings have not shown a thickness of over twenty feet at any point, and in every case, whether by vertical sinking or tunnelling, the cap of enriched ore is soon penetrated, soon yielding to the low grade peridotyte. The line of demarcation is usually sharp and well defined.

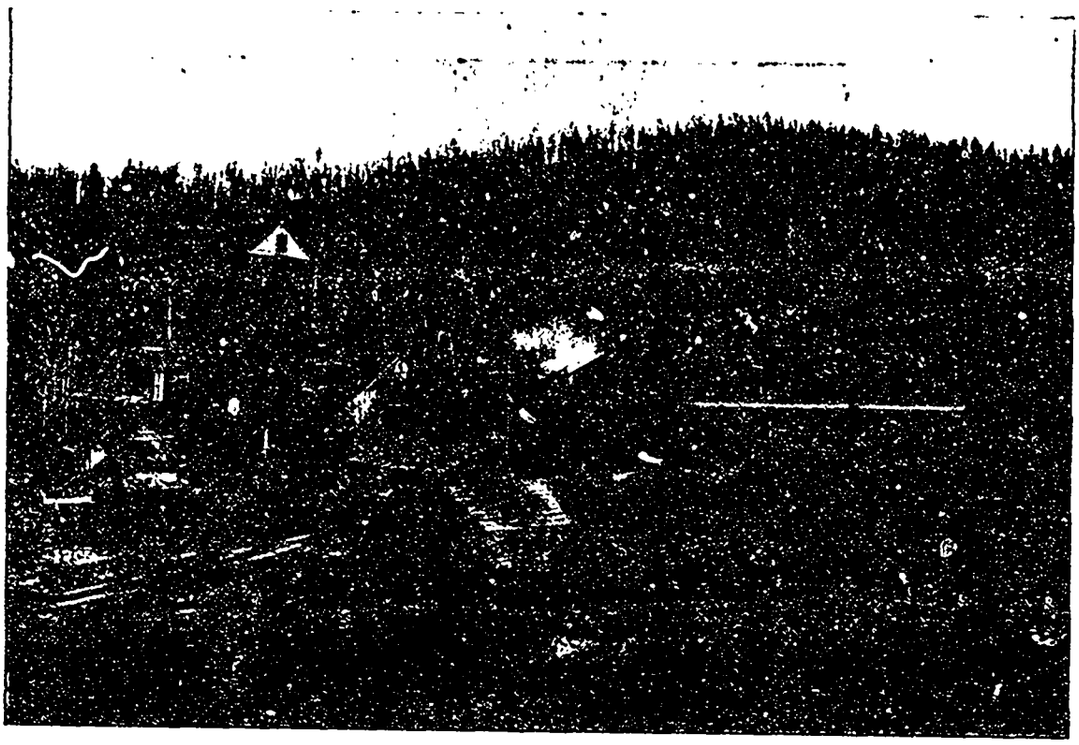
With a view of ascertaining the average grade, I took a large number of samples, carrying them on horse-back to head-quarters and breaking them down at my leisure. As my visit was for private interests, I do not feel at liberty to give definite figures; certainly not to mention the names of any particular claims examined, but reference to my assay book shows nickel determinations on samples varying from 1.23 per cent. of the metal to 9 per cent.,—the great mass of the mountain being low grade. Most of the better class of ore has been shipped to New York, running about 7½ per cent. of nickel. The most extensive working is known as Oregon Tunnel. This enters the steep hill side, passing through some twenty feet of ore, then suddenly entering the unaltered rock. For 250 feet this hard rock shows seams and crevices filled with green streaks carrying little nickel, and then

# SILVER LEAD INDUSTRY OF BRITISH COLUMBIA.

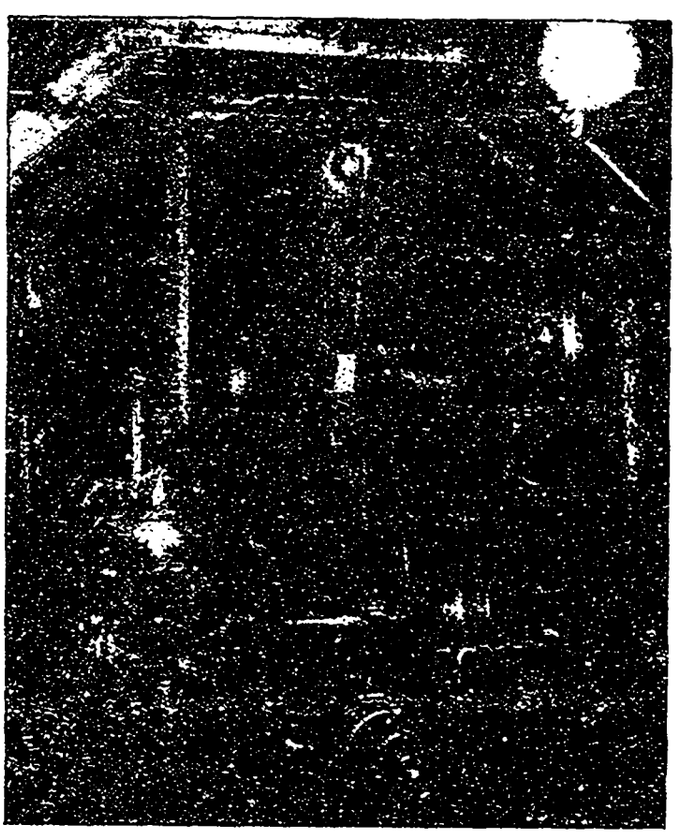


These Photos give some idea of the quantities of British Columbia Silver-Lead Ore at present awaiting a market

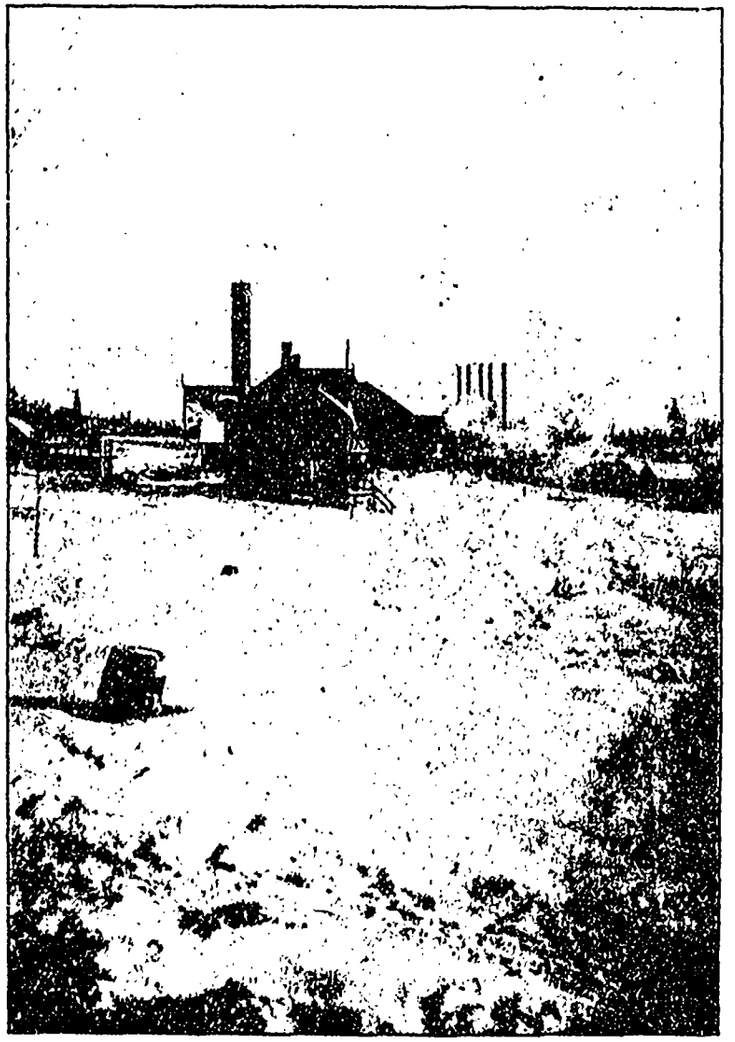
Silver-Lead Ore stacked at Kaslo Sampling Works.



Surface Plant B. C. Chartered Co., Eholt, B.C.

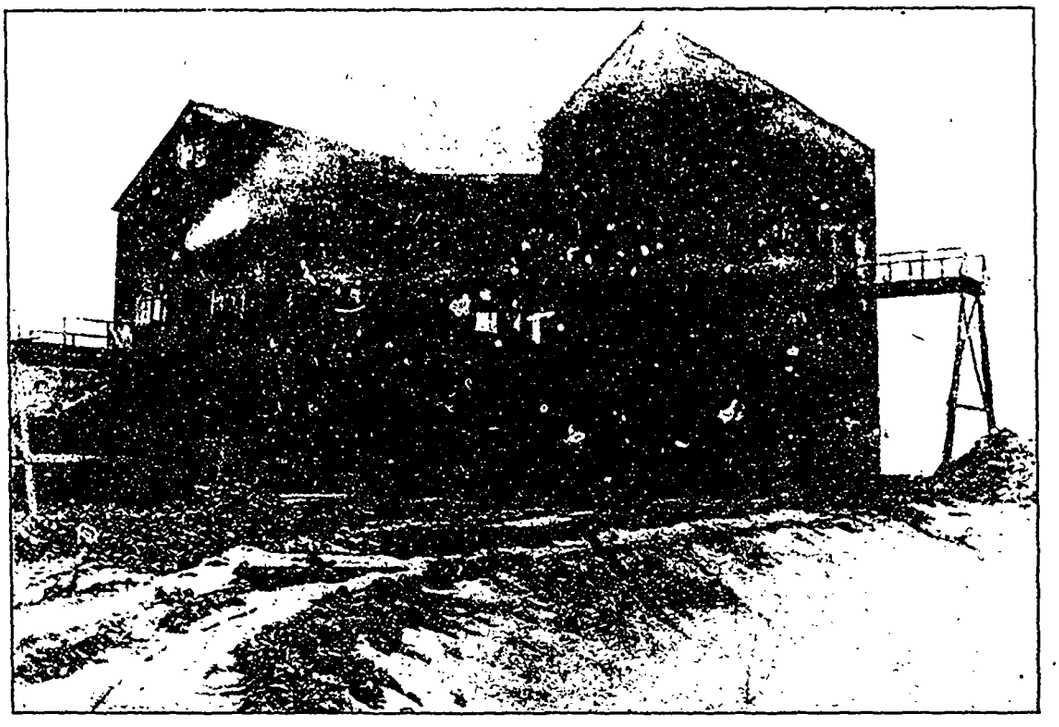


Station at 3rd Level -B. C. Mines, at Eholt Summit Camp, British Columbia.



New Works of the Mond Nickel Company near Whitefish, Ontario.

Open-cast working at Victoria No. II., Lot 11, Con. 4, Township of Denison, being worked by Mond Nickel Co.



No. 2 Shaft-house and Rock-house—Mond Nickel Company at Whitefish, Ontario.

Boiler and Engine-house and Terminal of Aerial Tramway—Mond Nickel Company, Whitefish, Ont.

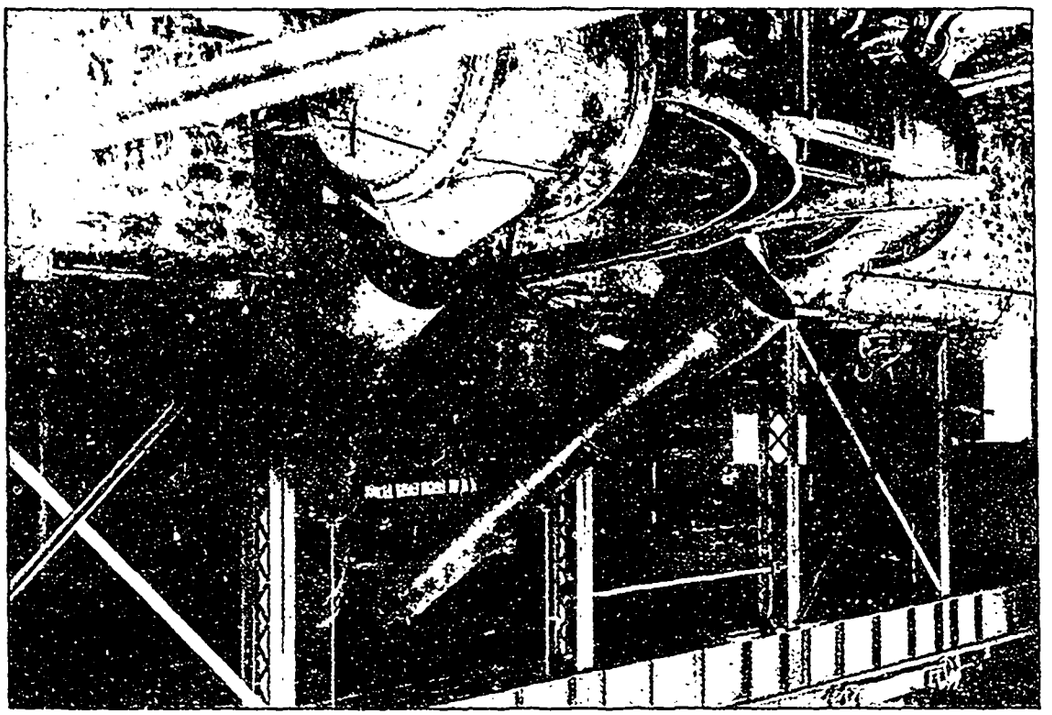
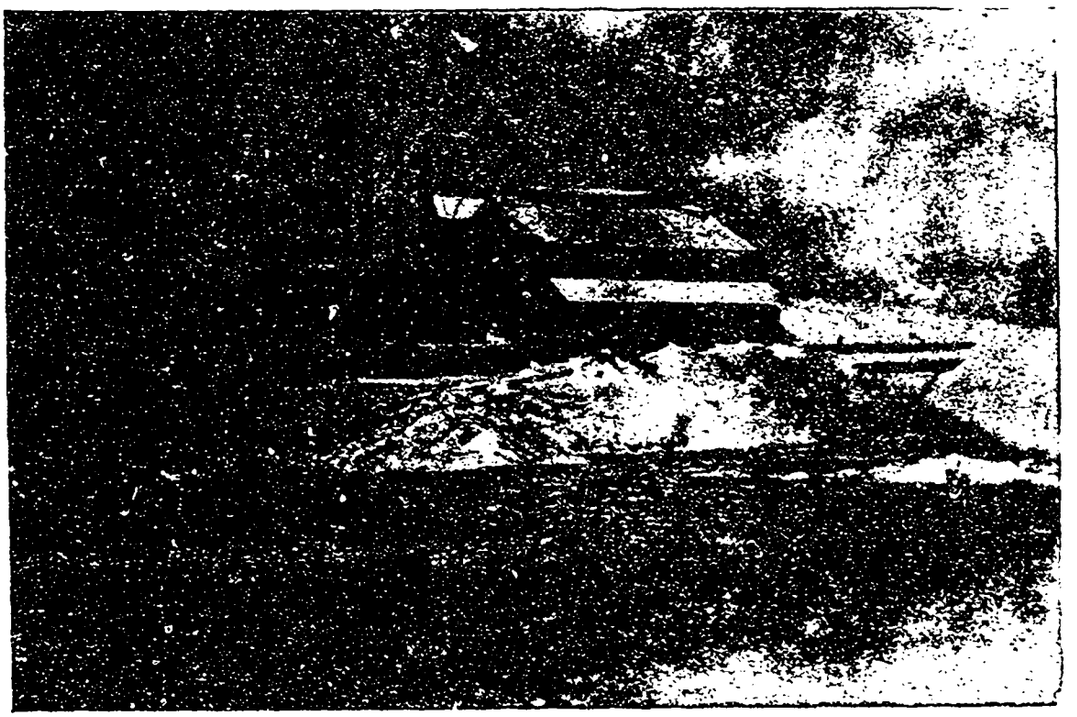
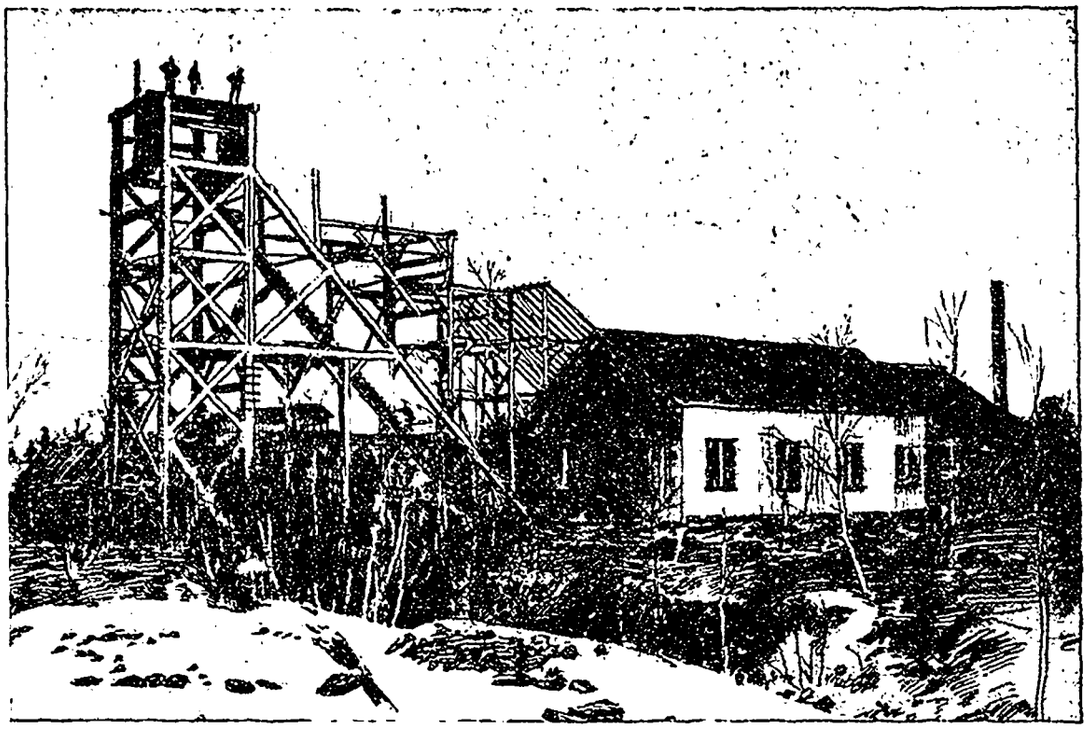


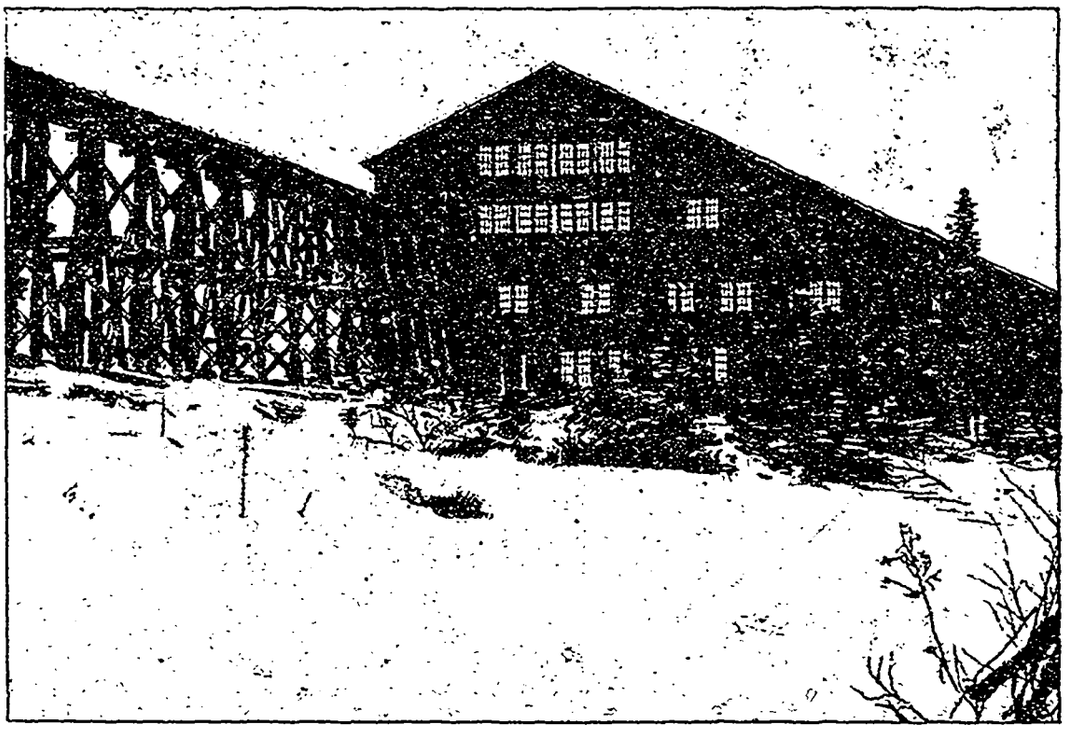
Photo showing Bessemer Convertors in foreground, and one of the Smelters in background—Mond Nickel Company, Whitefish, Ont.



Another view of the New Plant of the Mond Nickel Company at Whitefish, Ont.



Bruce Copper Mines of Ontario, Limited—New Plant at Bruce Mines in course of construction.



Bruce Copper Mines of Ontario, Limited—New Milling Plant at Bruce Mines.

Fine new Boarding House just completed for employees of Bruce Copper Mines, Limited.

Another pile of Silver-Lead Ore awaiting shipment at Whitefish, B.C.

Interior of one of the great Asbestos Quarries worked by King Bros. at Thetford Mines, Que.

Interior of Big Pits—King Bros. Asbestos Mines, Thetford, Que.

for another hundred feet the tunnel is in practically barren ground, hard as flint.

It is interesting to note one possible exception to the rule that the ore occurs only in this gossan form. On one of the claims which I visited, there was what really looked like a vein cutting not only the surface gossan but the peridotyte as well, this latter rock being shattered and almost slaty in the vicinity of the fissure, this vein being some two feet wide, and giving a fair assay of nickel. It is from this vein that considerable of the ore shipped to New York was taken. There were numerous tunnels from one hundred to two hundred feet in length, but all had the characteristics of the 350 foot tunnel above described.

With a view of suggesting the best means of treating this ore I had made a complete analysis of the hand-sorted mineral from the vicinity of the so-called vein, the result being as follows:—

| | Per cent. |
|---|---|
| Silica | 59.44 |
| Sesquioxide of Iron | 6.40 |
| Alumina | 0.41 |
| Manganese Peroxide | 0.33 |
| Lime | 1.11 |
| Magnesia | 16.27 |
| Sulphuric Acid | 0.30 |
| Arsenious Acid | 0.60 |
| Nickel Oxide | 8.23 |
| Loss on ignition | 1.00 |
| Undetermined chiefly Potash and Soda | 5.91 |
| | 100.00 |

It will be observed that this ore does not differ materially from the New Caledonian product, so that if enough 7 per cent. ore can be obtained it can be handled just as is this new Caledonian ore, but the future of the property will probably depend upon the ability to handle the low grade material without sorting. Nowhere should there be cheaper mining, as the deposit is superficial and so rotten that it could be excavated by a steam shovel with little assistance. If iron sulphides containing gold or copper sulphides can be found in the vicinity, the ore could be readily smelted into a matte, carrying all the metals of value, the subsequent treatment being such as is now given to the Sudbury product.

There is a possibility, also, that the methods of magnetic separation, which are now being applied successfully to low grade metallic sulphides such as zinc blende carrying small percentages of iron, can also be applied to these nickel ores; if the mineral may perhaps be simply crushed, dried and sized, the magnet separating the oxide and silicate from the iron and quartz. Experiments are being made in this direction.

In closing I venture to record my opinion that some of the nickel deposits of the United States need only the stimulus of an export duty on Canadian nickel to become regular producers, and to state that the mere agitation of the question of an export duty has brought experimental cargoes of Australasian and Norwegian nickel ores to New York for smelting.

Having demonstrated the fact that these ores can be handled economically in New York other contracts are being entered into, so that somewhat to the surprise of all concerned the United States finds itself independent of the Sudbury ores should it become necessary to do without them. It must not be forgotten that the freight from New Caledonia to New York, being all by water, is always quite as low as are the railroad rates from Sudbury and can be made lower yet by chartering vessels for a round trip. There has recently been considerable talk of a bounty on Canadian metallic products. When Canada offers a bounty she stretches forth her hands in welcome to the miners of all lands: when she imposes an export duty, thus shutting the door in their faces, she must not be surprised if other doors now open are closed to her products in turn.

# SILVER LEAD.

## Large Deputation of B.C. Mine Owners ask Government for bonus to establish Lead Refining Plant.

On Monday, 15th inst., a very large deputation from the Kootenay District of British Columbia, interviewed the members of the Government with the object of securing a bonus towards establishing Lead-refining in Canada. The deputation comprised:—J. Roderick Robertson, General Manager, and S S. Fowler, Mining Engineer of the London and B.C. Gold Fields, Nelson; H. E. Croasdaile, Nelson; George Alexander, Managing Director, Kootenay Ore Co., Kaslo; A. W. Goodenough, Mine Owner, Kaslo; D. Heap, Last Chance Mine, Sandon; G. F. Ransom, Slocan Sovereign Mine, Sandon; A. B. Clabon, and J. Ferguson McRae, Rossland; G. G. Henderson, H. Bentley, and C. P. Hill, Fernie, B.C.; Mayor Carlson, Ald. F. E. Archer, and Ald. W. V. Papworth, Kaslo; G. O. Buchanan, Kaslo; J. H. W. Smythe, Greenwood, B.C.; W. H. Adams, M. L. Grimmett, C. Cliffe, and J. Vallance, Sandon; and B. T. A. Bell, Secretary Canadian Mining Institute. Accompanying the delegation, and headed by Mr. W. A. Galliher, M.P., were a large number of Members of Parliament and Senators from various sections of British Columbia.

The company was received in Sir Wilfrid Laurier's office at noon. There being present in addition to the Premier, Sir Richard Cartwright, M.P., Hon. W. S. Fielding, M.P., Hon. Clifford Sifton, M.P., Hon. Wm. Paterson, M.P., and the Hon. James Sutherland, M.P.

Having introduced the party to Sir Wilfried, Mr. W. A. Galliher, M.P., handed to the Premier, and to the other Ministers, a copy of the following Memoranda showing the urgent need of legislation in favor of the Silver-Lead industry of British Columbia:—

### Bonus to Lead Refinery.

The mining of lead in British Columbia has grown into a most important industry. The production in 1900 amonnted to 60,000 tons of

| | |
|---|---|
| of silver-lead ore, containing silver to the value of | $2,295,099 00 |
| And about 30,000 tons of metallic lead of the value of | 2,690,577 00 |
| Or a total of | $4,985,676 00 |
| And the total production for all years to date has been | $20,000,000 00 |

At the first of the present year it was estimated that an output of more than 100,000 tons of ore, containing 50,000 tons of lead, would be reached in 1901. This is an expectation, in consequence of events that have since occurred, which will however be greatly disappointed.

The bulk of all of this class of ores hitherto mined in British Columbia, has been smelted in the United States, and the portion of it that has been smelted in Canada, has also gone to the United States to be refined.

At the beginning of 1901, the American Smelting and Refining Company, a trust which has absorbed nearly all the smelters and refineries in the United States, gave notice that it had withdrawn from the British Columbia market, and that until further notice it would make no contracts for the treatment of British Columbia ores.

The capacity of the Smelters in operation in British Columbia, and of the independent smelters in the United States, is totally inadequate to treat the normal output of the British Columbia mines, and many of the mines have in consequence closed down, and others have lessened their output.

It is still possible to have bullion that has been smelted in Canada, refined in the United States, but the refining charge has been greatly increased, and there is no tendency observable toward an increase of the smelting capacity in the districts now suffering. Nor is there likely to be, while the danger of the imposition of excessive rates for refining continues.

It is the opinion of this Delegation that for the relief of the distress at present existing, the surest and best remedy is the establishment, in some accessible situation within Canada, of a Lead Refinery, and that inasmuch as the establishment and successful operation of such a Refinery would require the employment of a large amount of capital, not only in the construction and equipment of the Refinery, but also in the purchase, treatment, transportation and marketing of the product, and inasmuch as the investment would be exposed to the danger of destructive competition from the American Trust, whenever it chose to re-open its works to Canadian lead, your memorialists respectfully sub-

mit that the Dominion Government should grant a bounty, to be paid for a term of five years, at the rate of $5.00 per ton upon pig lead, the product of ores smelted, and refined, in Canada.

We submit that the transfer to Canada of the industry of working up as far as possible our stock of raw lead, into manufactured forms, and the opening of an outlet through Canadian channels to the world's market, for the whole of the product, is a matter of importance to the Dominion at large; that the production of silver and lead in British Columbia is capable of great expansion; that the employment of labour afforded, will attract to the mining districts a large population of consumers upon a lavish scale of the supplies and products of Eastern Canada; and that in all respects the measure of development liable to follow the removal of the obstacles that now retard the industry will amply justify such expenditure of public funds, as the granting of our request would involve.

Your memoralists respectfully request that the rates to be charged for refining, by any refining company, proposing to take advantage of any Bonus provided by the Government, be made subject to approval, and revision by the Governor General in Council, and that full power be reserved by the Government to withhold the payment of money claimed to have been earned by any refining company if it be at any time made to appear to the satisfaction of the Governor General in Council that any excessive charges have been imposed, or unjust discrimination practised by such refining company, as against any Canadian product treated by them or offered to them for treatment.

LEAD DUTIES.

The inequality of the duties levied upon lead products coming into Canada has been repeatedly brought before the Government by special delegations and by the Board of Trade, and dealt with by the Convention of the Liberal party in the platform upon which Mr. Galliher, the present Member for Yale Cariboo Kootenay was elected.

It appears that the schedule of lead duties stands as it was framed many years ago when there was no production of lead in Canada. It is inconsistent with itself and with the tariff upon other goods of a similar class, and it operates to discourage the manufacture of lead in Canada, so that while we are producing and sending abroad a large quantity of lead in crude forms the Canadian market is supplied with the manufactured article from abroad. We ask the Government to revise this tariff and put it upon an equitable basis, which in our opinion would be reached by an increase of the duty upon pig lead from 15 per cent. to 20 per cent., and upon dry white lead from 5 per cent. to 25 per cent.

MINT.

That this Delegation respectfully urges upon the Government the consideration of the Mint question as brought before them in the memorandum of the Premier of British Columbia of January 28th, 1901.

RAILROADS.

We strongly believe that the requirements of Southern British Columbia demand the construction of Railways through the rich and undeveloped portions of Southern British Columbia, and that permission to build, and financial assistance where necessary, should be given to to any responsible company intending to build a railway, whether crossing the International boundary or not, subject in all cases to Government control as to rates, and subject to such regulations as will afford protection to Canadian industries as to coal and coke supply, where such railways are designed to tap coal deposits upon which such Canadian industries are dependent for their fuel.

Signed on behalf of the Delegates.

DAVID HEAP, *Chairman.* M. S. LOGAN, *Secretary.*

MR. J. RODERICK ROBERTSON,
General Manager,
London & B.C. Gold Fields, Ltd., Nelson, B.C.

MR. S. S. FOWLER, S.B., M.E.

MR. H. E. CROASDAILE,
Late General Manager,
Hall Mines Smelter, Nelson, B.C.

THE NELSON REPRESENTATIVES ON THE KOOTENAY DELEGATION WHICH INTERVIEWED THE GOVERNMENT THIS MONTH.

Mr. GEORGE ALEXANDER, of Kaslo, Managing Director of the Kootenay Ore Company and other enterprises, said :—The crisis in the mineral situation of British Columbia, which has forced us to this appeal for aid from the Government, is briefly that our mines, which have been increasing steadily in production and are now producing more ore than ever before, are suddenly and without warning deprived of a market for their output. To take as an instance one concrete case, my own, the mines under my charge were increasing by steadily shipping during last year, when a few days before the expiration of the annual contracts at the end of the year, under which our ore was sold to the American Smelting and Refining Company, we were served with a notice through a local lawyer that the American Smelting and Refining Company would not accept any more of our product after the end of the year. Hoping that this would prove only temporary we continued working as long as possible, until at last our ore was piled up in our works and the railroad and steamer wharves to an extent which left

no further room or possibility of working: and then being unable to sell a pound of the ore we shut down our properties.

To understand the situation it must be borne in mind that the lead comes out of the mine in the form of ore containing on an average about one-half lead and one-half waste, separable only by smelting; the smelting process produces base bullion cont ining lead and silver: and then the process of refining is required to desilverize the material, by separating the silver from the lead. Now the market for lead in Canada being necessarily a limited one, the American Government began by placing a duty of one and one-half cents per pound on lead in the shape of ore shipped into the U. S. for smelting, whilst charging a duty of two and one-eighth cents per pound, or twelve dollars and fifty cents per ton more, on lead, smelted in Canada. Having thus protected their market by a heavy preferential duty against Canadian smelting, they were then able to fix favorable rates for themselves in buying our ores which were smelted, refined and marketed in the United States. As long as there was any competition between the various American smelters, this gave us a certain market for our ores: but recently a combination or trust of practically all the smelters and refiners of the United States has been formed with a capital of one hundred million dollars: And with the object usual to trusts of keeping up by artificial means the prices of their product, their first step was to cut off the purchase of British Columbia ores, knowing well that under existing conditions this could only result in absolutely extinguishing the mining of B.C. lead ores and leaving the U.S. trust that much more free to manipulate the prices in the United States.

In Canada there are only two lead smelters in operation, both small, and unable from want of capacity to handle more than a fraction of the lead ore mined: a proof of this inability on their part is in the fact that I have been unable to sell to them during this year a single ton of the thousands of tons of ore already sacked on our various properties which are looking for a market. From these smelters the base bullion has to be shipped to the U S. to be desilverized or refined, the charge for which process has hitherto been about eight dollars; but, true to their tactics throughout, the American trust has now increased this charge by four dollars, or fifty per cent. The Canadian smelters are thus doubly at the mercy of the U.S. trust; to market their product they have to pay whatever rates the trust chooses to exact from them: whilst the trust, protected by their preferential import duty of twelve and one half dollars per ton against Canadian smelting, can whenever they like cut in and underbid the Canadian smelters in obtaining the raw material.

The situation built up by this consolidation of American tactics seems to present the one form of necessity that calls most loudly for relief by the direct extension of a bounty to tide a young and struggling industry over the difficulties of its first start in the face of the declared hostility of a powerful opposition. There is nothing that we can see but direct Government aid to keep it alive now. The Canadian lead industry has been sentenced to death by the American Smelter Trust backed up by a specially devised exaction of the American tariff: and without special intervention by our own Government that sentence will stand.

Mr. H. E. CROASDAILE, Nelson, referring to the causes that have led to the present want of smelting capacity to treat the lead ores of B.C., said:

With the exception of the ores smelted by the Pilot Bay smelter practically all the lead ores mined in B.C. went to American smelters up to the year 1899. In that year the Trail Smelter joined the combination of American smelters and began accumulating lead ores, and the Hall Mines Smelter at Nelson, of which I was manager, began to purchase, and made a trial run on lead ores with one furnace. I found the competition of American smelters was very keen, and threats were used of putting smelting rates below a price at which we could afford to smelt if I did not join the combination. This course I found it advisable to pursue for the year 1900.

Up to last year there was no evidence whatever that the demand for lead ores in B.C. would not continue, and any new lead furnaces would have found it almost impossible to have obtained any tonnage of importance. However last year the abnormal rise in the price of lead brought into operation many low grade mines in the United States, and the American Smelting and Refining Trust was able to obtain its supply of lead more from home than than B.C., and the result was that towards the close of the year there was little competition by American smelters, and this year owing to the great Trust not purchasing any ores at all the available smelting capacity is quite inadequate to handle the output of the mines, and in consequence some mines are closed down, while others maintain only a reduced output.

One reason for not increasing the smelting capacity in B.C. has now therefore been at least temporarily removed, but a more powerful reason still prevents the increase of smelters. The product of the smelters in the form of base bullion must still be sent to the American refineries before it can be marketed and the price charged for refining has a very important bearing on the prices charged for smelting. The American Smelting and Refining Trust has recently announced its intention of increasing its charge for refining lead bullion by $4 per ton; this means a corresponding increase in smelting rates, which in the case of an ore carrying 50 per cent. lead will amount to $2 per ton. It is therefore evident that although the competition in crude ores has ceased from the American side for the present, that the power still exists there of seriously hampering the lead mining industry of B.C. and the road is kept open for the Trust to again become a competitor for B.C. ores, at any time it may want to do so if the B.C. smelters are forced to maintain a high smelting rate through excessive refining charges.

The freedom of the lead mining industry of B.C. from the incubus of American control is absolutely essential for its increase, its prosperity and, possibly, for its very existence as a paying industry, and the only way to insure this freedom is by becoming independent of American refineries. The erection of a refinery in Canada is the solution of the difficulties now besetting lead mining, for with the certainty of reasonable refining rates the increase of lead smelting works in the district is assured.

I trust we may soon see the entire output of the lead mines of Canada, smelted and refined in Canada, and taking the yield at 120,000 tons of 40 per cent. f o b. ore that it was estimated these mines would yield for the current year, had no difficulties arisen the expenditure for labour, fuel and fluxes would amount to some $2,000,000 annually, and it is important to bear in mind that this expenditure will be paid for by money won from the mines, by money newly gained and added to the wealth of the country. Surely it is of the greatest importance to retain the expenditure of this large sum that will be annually increasing in Canada and for the benefit of Canadians and stop the heavy toll the American smelters and refineries have hitherto levied on the crude product of our mines and smelters.

Mr. S. S. Fowler of the London and B C. Gold Fields and Mr. D Heap of the Last Chance Mine, followed, strongly endorsing the plea for assistance towards lead refining, citing the experience of their respective companies as to the present greatly depressed condition of the lead market.

C. O. BUCHANAN, President Kaslo Board of Trade:—I wish to speak on behalf of the commercial communities of Kootenay. I have lived 15 years in Kootenay. I am not a mining man, I am a lumberman. I saw the first shipment of silver-lead ore from Illecillewait in 1888, and I have been in the midst of it ever since. The business has sustained a series of difficulties, and misfortunes. The first drawback was naturally the lack of trails, and later of roads; to a large extent these were supplied by the mine-owners, aided by the commercial people of the districts. The people of Kaslo in 1892 raised by subscription, and expended upon the road from that city to the Slocan mines, $20,000. For three years this was the chief outlet for the ores of the Slocan. Then if we did not build railways, we agitated for them, until we got them. I wish to say just here that I do not think that any expenditure that we have ever asked either of the Governments to make, has not when made, been amply justified by the results that have followed. In 1893 the price of silver suddenly fell from $1.16 per oz. to 55 cents, and later to 51¼ cents, its coinage value being $1.29. Then the duty on lead going into the U.S. was raised by the Dingley tariff from $15.00 per ton upon lead in ore, to $30.00 per ton, and from $20.00 per ton upon lead in smelted bullion, to $42.50 per ton. Then the British Columbia Legislature cut down the length of the mine shift from 10 hours to 8 hours, and there was a year of dead lockup on the question of the readjustment of the rate of pay. Each of these shocks prostrated for the time being the silver-lead mining industry, and from each of them it recovered, the mine owners adjusting themselves as best they could to the changed conditions. In 1900 the labor trouble was not settled until April, and in July the British Columbia Legislature doubled the tax upon output increasing it from 1 to 2 per cent., yet from the time that the mines resumed, until the end of the year, chiefly owing to the fact that the St. Eugene, the North Star, and the Sullivan mines in East Kootenay, for the first time entered the lists as large shippers, the output went to figures much in excess of those of any previous year. There was scarcely a cloud in the sky as regards the outlook for the present year, until the announcement came that the United States smelters would not treat British Columbia ores. The citizens of Kaslo put their shoulders to the wheel, in the hope that they would be able to do something to relieve the situation. The City Council of Kaslo, which body is represented here today by the Mayor and two of the Aldermen, submitted two By-laws to the ratepayers, one providing for exemption from taxation for a term of years

of a smelting plant, the other for a bonus of $50,000, in aid of a smelter. Both By-laws were carried, the first with only two dissenting votes, the second unanimously. A smelter company has been incorporated, and $10,000 of the stock locally subscribed for. But in seeking to interest capital in the scheme, we have been met with the objection that until refineries are established in Canada, there is no chance for the successful operation of more smelters. In making the appeal we do for assistance from the Dominion, we do not regard ourselves as entirely asking for charity. It is generally admitted that British Columbia is a contributor on a scale somewhat out of proportion to the revenues of the Dominion, the receipts per capita, comparing it is said as 55 to 20, with the average for the Dominion, and according to the memorandum prepared by the Provincial Government, aggregating nearly two millions of dollars in excess of actual annual expenditure in the Province. We claim that this excess is largely derived from the mining districts. The census will in our opinion, show a population in the mining districts of Southern Kootenay and Yale of 50,000, largely a population of adult males. Purchasers upon an extravagant scale, not only of food and raiment, but of machinery, tools, building material, and outfit, and appliances of all kinds for industrial purposes. We buy largely from Spokane, San Francisco, and Chicago, tea, sugar, tobacco, clothing, fruits and bacon, goods upon which we pay duties at the Custom House; and we buy largely beef, butter, oats, flour, and poultry, from the Canadian prairies; and we buy largely machinery, horses, hardware, boots and shoes, whiskey, and canned goods from Ontario and Quebec. Mr. Dunsmuir has suggested that in view of the large revenue received, the Dominion Government should contribute liberally in aid of railways in the mining districts, but I am sure that in the crisis that has arisen, Mr. Dunsmuir would agree with us that there is no railway scheme, upon which the expenditure of a million dollars, spread over the next five years, would accomplish as much for the development of the Province, as the establisment of a lead refining plant. It is not only a question of relieving and reopening the existing mines. The whole of Kootenay is lead producing—probably much of the adjacent territory. Hundreds of square miles are plastered with mineral locations, on nearly every one of which a mineral showing of some kind exists. As long as the smelting is done in the United States, the low grade properties will never be developed, but with home smelting they will be, and four times the amount of mining will then go on in the silver-lead mining districts of the Province. The value of the output will not be increased in that proportion, but the disbursements in the country will be. We are not entirely selfish either in the request we are making, there is at stake the development of a large industry in the manufacture of lead,—an industry which will locate itself here in the east. We do not particularly expect to have the refineries for which we are seeking specific aid, located in the west. They will be establi hed wherever the investors find most convenient, on Lake Erie or perhaps at Montreal. With pig lead cheap and abundant in Canada, our sheet lead will be pulled, and our lead pipe will be drawn in Canada, and the 6,000 tons of lead annually mixed into paint in Canada will be corroded at home, although probably some slight rearrangement of the tariff may be necessary to bring that about. At present lead as it comes out of the mine is worth slightly less than nothing. If the mine manager had the silver out of it, he could let it go over the dump, but unfortunately to get the silver, he must haul it to the railway, and pay railway freight upon it and pay for having it smelted, and for having the silver taken out of it in a refinery. So this lead which is worth nothing at the mine, goes through a United States smelter and a United States refinery, and to the Atlantic coast of the U. S. and to London and is there corroded, and becomes raw white lead, fit for paint. Then a portion of it comes out around the Horn to Victoria, and is worth there in a wholesale way 8 cents per pound; finally a small fraction of it comes up into the mining camps, and we who live there buy it at 13 cents per pound. This is an extreme case, but it represents what on the whole we are now doing. We are giving away this raw material and buying back in manufactured forms after it has made the circuit of half the globe, at least a part of it, and we are paying not only for all the skill and labor, that the foreigner has bestowed upon it, but the freight bill that has accumulated against it as well. I had the day before I started on this trip, an interview with Mr. Campbell, Manager of the Hall Mines Smelter at Nelson. He said: "If through the establishment of a refining plant, any better price comes to us, for our bullion, we will give the benefit to the mine owner. We desire an opportunity to increase our business, not increased rates for smelting." We are asking for this bonus for a refinery, because a refinery will supply the missing link between the smelters and the market. The refinery will take the bullion from the smelters, and enable the smelters to take ore from the mines. It will open up an all Canadian channel between the mines and the ultimate world's market, for our lead product but it will also, incidentally transfer to Canada a new and valuable industry afford an opportunity for a large number of Canadians to get employment and a profitable investment for a million or two dollars of Canadian capital

Mr. J. RODERICK ROBERTSON, General Manager of the London and B. C. Gold Fields, Nelson, concluded the addresses by a short and forcible appeal on behalf of his company that the bounty, or some other equally suitable assistance, be given to the lead miners of British Columbia with a view to creating a market for their ore intirely independent of the American Trust. Mr. Robertson having thanked Sir Wilfrid and the Ministers for their courteous hearing, the compauy retired much pleased with their reception.

# NICKEL LEGISLATION.

## Strong Delegation of Canadian Mining Men Present to Dominion Cabinet a Strong Plea for Disallowance of Ontario Act.

On Thursday, 11th April a very large and representative deputation of Canadian Mine owners and Mining Engineers visited Ottawa and had an nterview with Sir Wilfrid Laurier, the Premier, and his ministers, with the object of securing the disallowance of this Act, passed last year, by the Ontario Legislature, reserving the right to impose a prohibitive license tax on the export of nickel and copper ores and matte produced in Ontario.

The deputation was received in Sir Wilfrid's Office, there being present besides the Premier, the Hon. Edward Mills, Minister of Justice, the Hon. Clifford Sifton, M.P., Minister of the Interior, and the Hon. A. C. Blair, M.P., Minister of Railways and Canals.

The deputation comprised: Hiram Hixon, M.E., Mond Nickel Co., Whitefish, Ont.; B. T. A. Bell, Secretary Canadian Mining Institute, Ottawa; George R. Smith, M.L.A., General Manager Bell's Asbestos Company, Black Lake Que.; J. Roderick Robertson, General Manager London and British Columbia Gold Fields, Limited, Nelson, B.C.; Wm. Blakemore, M.E, Montreal; Dr. Frank D. Adams, Montreal; Leopold Meyer, M.E., Cataraqui Mining Co., Madoc, Ont.; J. P. Kirkgaard, General Manager Canadian Gold Fields, Ltd., Deloro, Ont.; S H. Flemirg, Ontario Graphite Co., Township of Brougham, Ont.; J. R. Blaikie, President Board of Trade, Subbury; James Stobie, Mine Owner, Sudbury; W. A. Allan, Mine Owner, Ottawa; Russell Blackburn, Mine Operator, Ottawa; James D. Sword, M.E., Rossland, B.C.; S. S. Fowler, M.E., Past President Canadian Mining Institute, Nelson, B C.; J. M. Clark, K C., Toronto; Francis T. Peacock, Montreal; A. P. Low, late Geological Survey of Canada, J. C. Gwillim, M.E., Ottawa; A. O. Buchanan, President Board of Trade, Kaslo, B.C. and a number of others prominently identified with the mining industries of the Dominion.

The party was introduced to the Premier by Messrs. McCool, M.P. for Nipissing and Dyment, M.P. for Algoma. A number of members of the House were also present including Col. Prior, M.P. and Mr. Earle, M.P. for Victoria, B.C.

Mr. B. T. A. BELL, Secretary of the Institute explained that the deputation would ask the Government to disallow the "Act to Amend Mines Act" passed at the last Session of the Ontario Legislature. They would also present the views of the Institute on the vital necessity of increasing the salaries of the members of the staff of the Geological Survey and of providing safer and more suitable accommodation for the invaluable collections of that institution.

Mr. J. M. CLARK, K.C., of Toronto, and counsel for Dr. Ludwig Mond, of London, England, strongly urged the exercise of the power of disallowance in this case. He pointed out that Dr. Mond had purchased his properties in the province of Ontario on the faith of the most solemn declaration of the Ontario legislature to which the Crown was a party, that such lands and the ores and minerals therein "shall be free and exempt from every such royalty tax or duty," such as those now sought to be imposed.

After Dr. Mond had purchased his properties and invested largely, an Act was introduced into the Ontario legislature giving authority to impose the taxes now complained of.

Upon it appearing that such tax was expressly in the teeth of the previous legislative declaration the word "tax" was changed to "license fee," but this Mr. Clark argued did not alter the nature of the legislation which

was a gross breach of faith. Mr. Clark then demonstrated that the amount of the tax or license fee authorized exceeded largely the value of the ores or matte taxed, so that the legislation directly authorized confiscation, and if not disallowed there would be no security for investments in Canada, Mr Clark urged that as the confiscation authorized was not for the purpose of dealing with property or civil rights or for the purpose of raising a provincial revenue, but for the purpose of attempting to regulate trade and commerce and the refining and smelting industries, it trenched upon Dominion jurisdiction and should be disallowed. Mr. Clark showed that no such provincial legistation had been allowed to go into operation and that if this act were not disallowed, it would form a dangerous precedent. So far the precedents were all in favor of disallowance and instances were cited where provincial acts not nearly so objectionable as the present one had been disallowed by previous Dominion governments. A strong point was made of the fact that if the time for disallowance is permitted to expire, there is no power to disallow any order-in-council, no matter how objectionable that may be, passed under the authority of the act. This in itself had been held by the Mackenzie government as sufficient grounds for disallowance. The report of the Hon. Edward Blake in favor of disallowance, in that case had been confirmed by order-in-council and the same course should be followed in the present instance. The exclusive jurisdiction over trade and commerce, had been entrusted to the Dominion authorities and such powers as those now in question should not be delegated to a provincial government. To permit this would deprive British subjects of a constitutional safe-guard to which they were entitled under the British North America Act, besides international complications for which the Dominion government would be responsible would be caused if such legislation is not disallowed. Dominion interests will greatly suffer if this act is allowed to go into operation as it is a great blow to the credit of Canada Mr. Clark said that no interests would suffer from the disallowance of the Act complained of.

Mr. HIRAM W. HIXON :—I wish to call your attention to the widespread and mistaken ideas about the extent and grade of the Sudbury nickel copper ores. It has been reported by unreliable and incompetent parties that there were hundreds of millions of tons of nickel copper ore in sight and that the grade was much higher than is the case. Statements which have given rise to the desire that the public should share in the fictitious wealth and is one cause of the mysterious legislation which we wish disallowed. In my capacity as Dr. Mond's agent it has been my duty to traverse the nickel copper country and sample the ore deposits. From my personal knowledge I can state that if there was one-tenth part as much ore as has been reported there would be much larger deposits than actually exist. The average yield for the whole district will not exceed three per cent. of the combined metals, about one-half nickel and one-half copper which would be thirty pounds of copper per ton, thirty pounds of nickel per ton, the net value of the copper and nickel in the ore after mining is at the present market price of the metals ten cents for copper and twenty cents for nickel :

| | |
|---|---|
| 30 pounds of copper at 10 cents..... | $3 00 |
| 30 pounds of nickel at 20 cents..... | 6 00 |
| Total net value one ton mined... ..... | $9 00 |
| Less cost of mining..... ..... | 2 50 |
| Remainder..... ..... | $6 50 |
| Proposed tax..... ..... ..... | 7 00 |

I do not wish to say that we do not have ores that contain more nickel and copper than these figures, but taking the average of all the ores of the district the yield or marketable metals would not exceed three per cent. There are a few deposits being worked which yield ores containing 6 to 7 per cent. combined metals and it is only natural that these should be mined first, but I submit that the average yield of the district will not be above three per cent. mark. From these average results it will be seen that the imposition of the tax would amount to confiscating the properties.

Mr. JAMES STOBIE, one of the oldest and most successful prospectors and property owners of Sudbury, who has been associated with the copper-nickel mining industry since its inception, cited instances where large foreign investments in nickel lands had been stopped by the intimation of this taxation.

Mr. BLAIKIE, president of the Sudbury board of trade, presented a resolution which had been unanimously adopted by that body asking the government to disallow the act.

Mr. B. T. A. BELL, Secretary of the Canadian Mining Institute, pointed out that the belief so general in the country that Canada controlled the world's supp'y of nickel was entirely erroneous. We had undoubtedly a very large and valuable territory of nickel and copper resources which during the past sixteen years, entirely unaided by government bounties or assistance of any kind, had developed large and prosperous mining and smelting industries.

These industries should be allowed to expand along natural lines. New Caledonia, Norway and other countries were now formidable competitors with Canada in the American market for nickel and were shipping very large quantities of ore monthly into New York and any such taxation as that proposed by the Ontario Act would tend to an increase of these importations and would most surely be hostile to the continued prosperity of the copper-nickel mining industries of Ontario. Nickel refining, however desirable as a Canadian industry was not economically available by any known metallurgical process at the present time and, even if it were, the policy of protecting a refining industry at the expense of the ore producer was ridiculous and entirely wrong. The mining industry, and by the mining industry he meant the miner, not the smelter or refiner, received no consideration from the government, no bounties were paid him on his output nor did he want any—all that he wanted was to be left alone. The Ontario Mines Act was not only unconstitutional but it was inexpedient. It was a menace to the investment of capital, for no investor would put a penny into Ontario copper-nickel lands as long as such prohibitive taxation was likely to be imposed. Perhaps Sir Wilfrid would remember the Quebec Mining Act passed by the Mercier administration nine or ten years ago. That Act was very similar to the legislation of the Ontario Government in as much as it sought to impose taxation upon mining property which had already been sold or alienated from the Crown unconditionally. On the representations of the mine owners of Quebec the Dominion Government had exercised its influence to have that legislation withdrawn. Such action by the government now would greatly accelerate the present great expansion of mining industry in Ontario.

Mr. George R. Smith, M.L.A., manager of the Bell's Asbestos company, stated that while he was more directly concerned in mining in Quebec the provisions of the Ontario Mines Act viewed from a practical standpoint were inexpedient and unwise. Foreign capital, so much desired in Canada, was not likely to be invested while such prohibitive taxation was at all likely to be enforced.

### BETTER SALARIES FOR GEOLOGICAL SURVEY.

Dr. Frank D. Adams, Montreal, followed with a strong appeal on behalf of the Geological Survey. The entirely inadequate renumeration paid to the officers of this most important branch of the public service was rapidly depleting the survey of the men whose knowledge and skill were so much desired. He cited the names of Tyrell, Coste, Carlyle, Dr. Lawson, Low and many others who had left in recent years for more remunerative positions. While the government could not hope to compete with mining corporations in the matter of salaries the remuneration paid was altogether too small. He also directed attention to the entirely unsafe and inadequate housing of the Survey and the urgent desirability of having accommodation provided in keeping with the invaluable character of the survey's collections.

Mr. B. T. A. BELL :—It was intended to have presented some facts concerning the present greatly depressed condition of the silver-lead industry in British Columbia and the desirability of the government extending some assistance to the lead refining, but as a large deputation from the west had just arrived in the city for the same purpose, it would be better to postpone this discussion until a later interview. The deputation then withdrew.

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MINERAL DISCOVERIES IN THE KINGSTON DISTRICT.—The discovery of various "shows" of zinc blende and galena, and also, it is said, of Franklinite, in the Township of Bedford, north of Kingston, and a few miles east of the Kingston & Pembroke Railway, gives occasion to remark that it is really surprising that the galena deposits of that region, well known over 50 years ago, have never been developed. A considerable tract of land, through which galena was superficially traced, was acquired by a Mr. Hunt, who did nothing with his property. The Frontenac Lead Mine was opened on the same formation in Loughborough Township by an English Company whose resources were spent, it is reported, mainly in riotous living. Now that the more valuable mineral, zinc blende, has been discovered, it is hoped that the enterprise of Kingston capitalists, guided by the savants of the Kingston School of Mines, will be equal to the task of developing these new discoveries.

## Successful Annual Meeting at Halifax. President Libbey Handles Without Gloves Fake Gold Mining Schemes in Nova Scotia.

The annual meeting of The Mining Society of Nova Scotia was held, pursuant to notice, at the Halifax Hotel, on Wednesday the 10th day of April, 1901, at 10:30 a.m.

President W. L. Libbey occupied the chair.

The following gentlemen were present: Vice-President G. W. Stuart, Truro; Past-President H. S. Poole, Halifax; J. E. Hampson, Halifax; R. H. Brown, Sydney Mines; Charles Fergie, Westville; A. A. Hayward, Waverley; F. H. Mason, Halifax; J. H. Austen, Halifax; G. S. Troop, Halifax; A. McNeil, Halifax; H. M. Wylde Halifax; F. W. Green, Halifax; G. L. Burritt, Halifax; W. R. Askwith, Halifax; D. Forbes Angus, Treas. I. Co. M. Co., Montreal; T. R. Gue, Halifax; George E. Francklyn, Halifax; C. C. Starr, Halifax; Sydney Smith, Halifax; F. W. Haunright, Halifax; H. W. Weller, Montreal; Hon. S. H. Holmes, Halifax; D. W. Robb, Amherst; Percy Brown, Halifax; C. N. Crowe, Bridgewater; J. W. Pilcher, Halifax; Todd C. Woodworth, Halifax; Harry Piers, Halifax; Frederick Taylor, Boston; G. J. Partington, Hon. Robt. Drummond, Hon. Angus McGillivray and a large number of others.

The Secretary read the minutes of the last meeting, which were read and approved.

### NEW MEMBERS.

The names of the following gentlemen were proposed for membership: F. W. Green, Halifax; J. W. Pilcher, Can. Genl. Elect. Co., Halifax; Marland L. Pratt, Crow's Nest Mining Co., Boston; C. J. Coll, Genl. Manager Acadia Coal Co.; L. F. S. Holland, Waverley G. M. Co., Waverley; Todd C. Woodworth, San Francisco; Sydney Smith, San Francisco; C. N. Crowe, Bridgewater; A. B. Kenyon, Mt. Uniacke; A. J. Moxham, Genl. Manager Dom. I. & S. Co., Sydney; William Bolase, Manager New Egerton G. Mining Co., 15 Mile Stream; E. F. Harvey, St. Johns, N.F.; Sydney Wood, St. Johns, N.F.; Otto Collings; Hon. S. H. Holmes, Halifax; J. C. Mahon, Halifax and D. Forbes Angus, Secy. Intercolonial Coal M. Co., Montreal; C. H. Porter, Halifax; F. A. Huntress, Manager Halifax Elect. Tram Co., Halifax; Fred W. Hart, Halifax; L. J. Hesslein, Halifax; E. Howard Hughes, Montreal.

On motion the ballot was dispensed with, and on motion of Mr. H. M. Wylde, seconded by Mr. F. H. Mason the above gentlemen were declared duly elected members of the Society.

### ELECTION OF AN HONORARY MEMBER.

Mr. ALEX. McNEIL: I should like to move that Mr. Harry Piers be made an honorary member of the Society. As members are aware, Mr. Piers as Curator of the Provincial Science Library and Museum is doing most valuable work, one that is going to be of importance not only to the mining interests but in our own and those of the Province. I therefore have much pleasure in making this motion.

Mr. H. S. POOLE: In connection with Mr. Piers I would like to remark, as some of our members may not be aware of it, that the bulk of the Library belonging to this society has been placed under Mr. Piers' care, and that he is now looking after most of our books, and the intention is, I believe, to place other volumes as they are bound similarly. A record will be kept of them and they will be systematically looked after. Mr. Piers is an enthusiastic naturalist, and takes great interest in all scientific studies, and as secretary of the Nova Scotia Institute of Science he would bring this Society more in touch with that Society.

Mr. FERGIE concurred.

The motion having been put, Mr. Piers was unanimously elected an honorary member.

### MEMBERS REMOVED BY DEATH.

Mr. H. M. WYLDE expressed regret at having to call the attention of the meeting to the loss by death of two members of this Society, Capt. A. L. Howard and Mr. Geo. A. Pyke, as well as that of Dr. G. M. Dawson, one of our honorary members.

The PRESIDENT: It would seem fitting that some resolution be passed by the Society in connection with the loss sustained. Mr. Pyke was a member of the Society for many years, and took a great deal of interest in its proceedings. He was a member of the gold mining branch and a most estimable and whole-souled gentleman, whose loss I think all of us individually deplore. Major Howard was one particularly well known to all of us—of large soul, a citizen of the world, a patriot—who in South Africa has given up his life for the British flag. We certainly all deeply deplore his loss. Dr. Dawson's services as a geologist to Canada will live in history. A Nova Scotian born, his services have been national, and will live long after I am forgotten.

### PRESIDENT'S ADDRESS.

The President, Mr. W. L. LIBBEY: Gentlemen of the Mining Society of Nova Scotia—The closing year of the century has gone into history ripe with culminations in the mining records of this province, and of the greatest interest to our Society. Our scientific and practical miners are the men who above all others have in the past and will to a vastly increased extent in the coming century contribute to the enlargement of the industrial and commercial resources of Nova Scotia.

### COAL AND IRON INDUSTRIES.

The quantity, quality, and availability of coal and iron are questions which weigh against the destiny of nations. Already the products of our matchless coalfields are reckoned in one of the greatest economic questions of the age—that of fuel—and the certainty of iron production is a coming event which casts a most portentous shadow.

### INCREASED GOLD PRODUCTION.

Our gold output is furnishing an increasing addition annually to the least evanescent form of wordly wealth. On every hand scientific development is taking the place of aimless wandering in recovering earth's treasures; trained thinkers are superseding brute force; and perfected machinery is retiring for ever the crude appliances of the past. It is with no ordinary emotion of pleasure therefore that I greet today this representative gathering of all of Nova Scotia's mining interests.

### GROWTH OF THIS SOCIETY.

It is good to note that our society is gaining in numbers and influence, and that, as is evidenced by our Secretary's report, we are in a satisfactory financial condition.

### VISIT OF THE AMERICAN INSTITUTE.

As you are all aware, our Society, in conjunction with the Canadian Mining Institute, had in August last the pleasure of entertaining a large delegation of members of the American Institute of Mining Engineers on a most successful and interesting trip from Quebec to Cape Breton, Newfoundland, New Glasgow, Westville, Stellarton, Pictou, and Halifax. To the unceasing labors of Mr. B. T. A. Bell and our Secretary, Mr. H. M. Wylde, are due a large share of the words of praise for the successful outcome. The Government at Ottawa lent timely aid to the Canadian Society, and our local Government, with a ready comprehension of the importance of the visit, came to our aid in so substantial a manner as to enable us, by the use of a portion of the Society's funds, to entertain hospitably this very representative delegation of the leading mining engineers of the world.

In Cape Breton the Dominion Iron and Steel and the Dominion Coal Companies showered every attention and boundless hospitalities upon us. All details of the enormous plants and workings were open for inspection, and fully explained by an untiring corps of able members of their staffs.

The City of Sydney gave the hand of welcome. At New Glasgow, Westville, Stellarton, and Pictou a reception and warm greeting was given which will live in memory. Nature gave good weather in Halifax and Waverley, enabling the days to be filled with excursions and investigations which will be remembered.

The far-reaching effects of this visit of capitalists and agents of capital, to the most of whom the industrial resources of this Province were practically unknown cannot be over estimated. It is regretable that so few of our own members were able to take the trip.

### REVISION OF THE MINES ACT.

A revision of the Mines Act has been effected in the past year which it is to be hoped will give general satisfaction. The work of revision having been in most able hands and suggestions and criticisms from mining men being given careful attention.

## MARKED PROSPERITY IN THE COAL TRADE.

The increased and increasing market for coal has for the first time taxed our collieries beyond their capacity for delivering, the Provincial Treasury is becoming plethoric from royalties, coal miners are as well paid as in any part of the world and work less, indeed with the prospective increase of working collieries in view, the day can not be far distant when labor must be imported.

## PROSPECTING FOR COPPER AND IRON ORES.

The prospecting and developing work done in the iron districts gives substantial reason for belief, that iron ore production will be an important feature at an early date.

In Cape Breton County there is good reason to hope for workable deposits of copper ore but on the main land I have yet to learn of any inducements to invest capital in copper. The discovery of copper stains in the mud on the banks of French River however was enough, in the opinion of certain gentlemen, to organize a million dollar company, call it the Copper Crown Mining Company, ask the Canadian Government for a bounty on copper, work Pictou for a free site, exemption from taxes for 20 years, etc., buy some second hand mining machinery, erect an alleged "smelter" and finally to energetically proceed to sell stock in the industrial towns of New England.

## GOLD MINING.

The Gold Mining Industry is, I believe, in a more healthful state than ever before. Each year sees an increasing amount of legitimate development work done. The vital necessity of creating ore reserves is being forced on our operators and the altogether wasteful and vicious system of at once taking out every pound of ore uncovered is being slowly but surely relegated to the past. A goodly share of the work in all gold districts is being done by legitimate investment with out stock jobbing, at Waverly, for instance, where development has been in progress for some years there has been recently erected a magnificent plant and the public has not been asked to buy stock.

At Caribou extensive development on a large body of ore has been progressing for several years, the work being backed by private capital.

And, equally, in many other districts, honest and comprehensive work is being done which is sure to result in good not only to the operators but to the industry in general.

## FAKE SCHEMES CONDEMNED.

I regret to have noticed several instances, however, where this Province has been made the base for schemes which need the light of day on them and, at the risk of wearying you, I will call your attention to some of the most flagrant. I have here a circular of "The Union Development Co." with "mines in Nova Scotia, California, Mexico and Montana, capital $5,000,000, Mr. J. Burpee Neily, Boston, Mass., President," etc. Now this man is exceedingly well known in his native Province so you will not be surprised to learn that the attempts to float this scheme were in Worcester, Lawrence and other Massachusetts Towns and in Montreal. To give an idea of the probable reliability of all the claims in this circular I will quote and comment on one claim the "East Mine located at Brookfield, Queens County" from which the circular says: "Official returns (at the mines office) show that more than 5,000 tons of ore have been mined and milled from this vein producing an average of 19 dwts. to the ton."

Now this statement is true, but facts which he does not mention are equally true. I will supply a few. First, at the time of his statement no returns had been made at the Mines Office for over six years, although operations had been carried on the most of the time and for something over two years by Neily himself, and always at a heavy loss, incurred, in my opinion, by ignorance.

The circular also claims as "possible profits from Nova Scotia mines (Neily's mines, remember) per year $936,000" or about 50 per cent. more than our gross output last year. All his Nova Scotia mines have since been closed and bills for labor and supplies are unpaid.

When the Copper Crown Mining Company's dreams at New Annam began to fade and their "Smelter" at Pictou would not even smelt, the cargo of genuine copper ore bought in Newfoundland, the promotors secured some gold areas at Mills Village, Queens County, sunk a shaft, struck a small pocket of rich specimens, took them and scooted back to Boston, organized a million dollar stock company, called it the Gold Eagle Mining Company, Office, Room 74-373 Washington St., Boston, printed circulars showing up their property in iridescent hues and from one of those circulars I make extracts:—

"A 20 stamp mill will crush about 40 tons per 24 hours of this rock which will average at least 2½ ounces of gold per ton, value $50.00, making $2,000 gross daily.

The maximum expense will not exceed $100, leaving $1,900 or $47,500 per month.

When increased to 200 tons per day will yield a net profit of $237,500 monthly or $2,850,000 annually.

Two thirds of the profits will be available for dividends (payable monthly), the balance will be reserved for a working surplus."

With an euphonious regard for the eternal fitness of things this advertisement in a recent number of a New Bedford paper:

"DIVIDEND PAID.

"The first quarterly dividend of the Gold Eagle Mining Co. will be paid through the office of H. F. Babcock, 218 Fourth st., New Bedford, Mass., April 1st, 1901, to all stockholders in this section."

This Copper Crown—Gold Eagle combine have sold many thousands of shares of Gold Eagle stock to victims in New Bedford, Brockton and other industrial cities in Massachusetts, at from par to $2.00 per share, and now they propose to pay a dividend in order to bolster up a desperate effort to dispose of another larger block of Gold Eagle stock before the crash comes.

What have been their mining operations? Briefly these: On their property a rattle trap 10 stamp mill has been erected, fitted up with obsolete machinery which had been rusting on Molega Barrens for 12 years.

A short time since a sworn return was made at the Mines Office from the Gold Eagle mine for their mill work and returns since commencing crushing last October, and they are, 435 tons of ore crushed and 318 ounces of gold extracted.

Now I am in position to state that from 1,500 to 2,000 tons of ore were crushed, and it was poor mill work at that. Where is their $50 ore and where do the dividends come from?

Not content with these operations the same gentry are now operating in the Leipsigate District, and are out with "Facts and Figures worth reading" about the "Black Hawk Mining Company," which is "Located on the Mother Lode (!!) of Nova Scotia, nine miles from Bridgewater," and where "there is now according to measurement upwards of 60,000 tons of milling rock, blocked out, with assay value from $20 to $50 per ton in vein No. 1."

I will stake my reputation that all the mines in that district have not 6,000 tons of ore blocked out; and yet these men are buying large space in the Boston *Sunday Herald* and offering their stock at par on a capitalization of $1,000,000.

Such operations as I have described do untold harm to the legitimate mining industry. I believe in the future of each of the districts I have mentioned, but not in such flim-flam games as I have described.

## NEED OF A GOVERNMENT ASSAY OFFICE.

And here are arguments for a creation of a Government Assay Office with a department for the collection and dissemination of reliable statistics and information as to our metalliferous resources.

Nova Scotia reserves of coal iron and gold, in my belief, offer attractions to investors, second to no other portion of the mining world. All the adjuncts necessary to the mining man are always at his door. No country offers more generous and equitable laws to the miner. Life and property rest in unrivalled security. The earth does not know a more hospitable people.

In my loyalty to these great mining resources lie my apologies for taking so much of your time to-day. (Applause.)

## VOTE OF THANKS TO PRESIDENT.

Mr. F. H. MASON proposed a vote of thanks to the President for his admirable address.

Mr. Mason's motion was cordially seconded by Mr. Fergie.

THE PRESIDENT:—Your words of appreciation are very agreeable to me. The fact that the public has been often victimized in the past and is being victimized to-day, is the reason why I have written so strongly on a subject on which I feel strongly.

## FINANCIAL STATEMENT.

THE SECRETARY read the financial statement for the past year. Also a statement of the receipts and expenditure in relation to the reception of the American Institute of Mining Engineers in August last, all having been audited.

On motion of Mr. Stuart, seconded by Mr. Fergie, the reports were received and adopted.

Mr. McNEIL referred to the matter of comparisons of output, stated that a recent issue the CANADIAN MINING REVIEW published a statement which did us an injustice, inasmuch as it coupled the output of this Province with the other Maritime Provinces.

[EDITORIAL NOTE.—The item referred to is a very brief summary of what was a very exhaustive review of the mineral industries of the Dominion during 1900, presented by Mr. Bell, Secretary of the Canadian Mining Institute. When this paper is printed it will be found to do full justice to the remarkable expansion of mineral development in Nova Scotia.]

Mr. STUART:—I think it unfair that Nova Scotia producing from 95 to 98 per cent. of the mineral products of the three Maritime Provinces should be coupled with the other two Provinces. As a matter of fact Prince Edward Island produces no minerals, and we should have the credit of the entire $11,000,000 output credited to "Maritime Provinces."

Mr. FERGIE:—I think, Mr. President, that we only want to draw Mr. Bell's attention to the fact that we do not care to be coupled in that way with the other two Maritime Provinces.

THE PRESIDENT:—I am sure that if Mr. Wylde will call Mr. Bell's attention to the apparent injustice of coupling us with the other Provinces he would be only too glad to rectify it.

Mr. FERGIE:—I would move that such a committee consisting of the President, Mr. Poole and Mr. McNeil wait upon the Premier in regard to advertising the mineral resources of the Province.

Mr. POOLE:—I would suggest that the President and such members as he might name be the committee. On behalf of our coal mines I would also like to refer to another matter. The Premier has interested himself and his Government in the importation of horse flesh suitable for certain purposes. Our coal mines are more and more in want every year of a breed of horses, short in the legs and stocky, and I think the suggestion might be made and Mr. Murray asked to bring the services of veterinarys to bear upon the importation of a breed of horses which would be suitable for this class of work.

Mr. BROWN:—The tendency is for the breed that the mines require of little hardy ponies to get scarcer all the time. The farmers as a rule will not keep two kinds of horses.

THE PRESIDENT:—It is then proposed that the committee interview Mr. Murray as to the necessity of more information as to our gold fields being distributed, or rather the more frequent and continued advertising of Nova Scotia's resources, both of gold and coal.

Mr. GREEN.—At the present time there is in preparation the Exhibition prize-list. It might be a profitable source of advertising. A page or two of such matter would go very well in that prize-list, which has a circulation of 7,000 copies.

Mr. McNEIL:—In connection with that, should not this Society take some interest in the Exhibition, with a view to getting a better mining exhibit? Last year a gentleman wanted to exhibit gold ores, but because there was not a general exhibit of gold ores it was declined. At any rate he did not exhibit them.

THE PRESIDENT:—There is in existence somewhere a collection of our ores which was sent to the Paris Exposition.

Mr. McNEIL:—That collection is now in Glasgow and will be there a year; and it is to go to the museum after it comes back. It strikes me that some year we might make a special effort to make a mineral exhibit a feature of the Exhibition. This might be a good year in view of the fact that there are so many new mines, which are always more or less anxious to exhibit.

Mr. FERGIE: It is a matter of difficulty to get a good exhibit together.

THE PRESIDENT: I am in hopes that Mr. Fairbault will not cease his work until he gets down in the district I am operating in and give us a survey there.

I think the motion before the house now is to appoint the President with discretion to name his co-adjutators to interview the Premier in regard to the various points we have been discussing.

The motion having been put was carried.

THE PRESIDENT I would like very much to have the assistance of Mr. Poole, Mr. Hayward and Mr. McNeil. There are other gentlemen who would be very valuable, but I suggest these three gentlemen because they are so immediately available, being resident in or near the city. This is a matter I take a personal interest in, and probably within the course of three or four weeks we can arrange a meeting.

## WORK OF THE GEOLOGICAL SURVEY.

Mr. STUART: I have been gathering some information in regard to the work in the Geological Survey Department at Ottawa. There has been a good deal of complaint for the last 10 years in regard to the work which has been done by Mr. Fairbault and Mr. Fletcher, in that some of their maps and reports have not been issued. Possibly the department is in a position to satisfy us that there has been no intentional discrimination. I do not want it understood that anything I say is intended to reflect on the department at Ottawa. I have some notes here which I have prepared with some little care.

At the present time there are ten maps of Nova Scotia which have been surveyed for over ten years and engraved for publication, but which have been for some reason withheld from the public.

All the country as far west as Windsor has been surveyed, but the compilation of the maps, over 20 in number, has been delayed, said to be on account of insufficient help in the office. The result is that some 30 maps surveyed from 5 to 10 years ago have not yet reached the eyes of the public, and we are therefore receiving no benefit from the labors of these efficient and hard working members of the Geological survey department.

Much of the work referred to has been done by Mr. Hugh Fletcher, which is a sufficient guarantee of its correctness.

Why this work of the past decade of this most competent official of the department should be kept "under a bushel" is a mystery that should be solved at once.

I would like also to ask why there has not been issued a general report on the Geology of the gold fields of Eastern Nova Scotia? Mr. Fairbault has gone over all this ground in the most thorough manner, and while a number of maps have been issued, there has been no report. It is now some ten years or more since this work was begun. I notice there is no such delay in giving the public the full benefit of the work done in Ontario and in the West by the Geological department.

In conclusion I would move this resolution;

"*Resolved*, that this Society desires to call the attention of the Federal Government to the large number of Geological maps of Nova Scotia, both of the Gold and Coal series, that have been prepared for many years but are still unprinted;

That the delay seems unfair to the mining industry not only of this Province but of the Dominion. We would therefore respectfully urge a speedy consideration of this important matter.

At the same time, this Society further desires to say they would be gratified should it please the Ministry to appoint Dr. Bell, the past assistant director, now acting director, to the position of Director of the Geological Survey."

Mr. FERGIE: There is one part I think we had better leave alone. I think we made a mistake in Montreal last month in making any suggestion about who should succeed Dr. Dawson, and I think this Society should leave it alone.

Mr. POOLE agreed with Mr. Fergie in thinking the Institute made a mistake.

Mr. STUART: That was really the reason I referred to it in my resolution, because I found there were a number present at that meeting in Montreal who have since felt a mistake was made. Some of them have expressed themselves to that effect. I think perhaps a mild suggestion from this Society might have a good effect.

Mr. HAYWARD: Do I understand that the action taken in Montreal will be presented to the Government?

Mr. FERGIE: It has been presented.

Mr. HAYWARD: Then I would think it advisable to put ourselves on record as against their recommendation. If we have a different opinion from that of the Canadian Mining Institute then we should express it.

Mr. FERGIE: We might put it in such a way that while we do not wish to dictate, still the most careful consideration should be given and the best and most practical man appointed.

The PRESIDENT: I do not see that the Canadian Mining Institute could take any offence if we passed this resolution.

Mr. POOLE said our interests were not quite the same.

Mr. STUART. I have every reason to believe that Dr. Bell is in sympathy with Nova Scotia. At least he has no preference for the West over Nova Scotia.

Mr. HAYWARD: I quite agree with Mr. Fergie that some of the members of the other society see their mistake in passing that resolution, and I second Mr. Stuart's resolution.

Mr. F. H. MASON: I think perhaps before you put the resolution, Mr. President, it might be well to add that a copy be sent to the Government. It would be of little use unless it is sent at once.

The PRESIDENT: I think it would be sufficient if we instructed the Secretary to at once mail a copy of the resolution to the Minister of the Interior.

The resolution having been put, was carried unanimously.

The PRESIDENT: Mr. Poole has made a suggestion that we should go in a body to the Provincial Museum and see it. We are interested in that museum, and we are recognised by the Government as having rights there, and I think it would be a good idea to make an official visit.

I may add that Mr. Poole has very kindly requested us to pay a visit this afternoon at five o'clock to his house, and "handsel" the few pieces of plate presented to him on his retiring from the management of the mines of the Acadia Coal Company.

## ELECTION OF OFFICERS.

The PRESIDENT: Our next business will be the election of officers for the ensuing year.

Mr. MASON: I would move that the following gentlemen be elected the officers of the Society for next year:

President—W. L. Libbey.
First Vice-President—George W. Stuart.
Second Ditto —A. A. Hayward.
Third Ditto —Alex. McNeil.
Secretary—H. M. Wylde.
Auditor—J. H. Austin.
Council—B. C. Wilson, M. R. Morrow, Charles Archibald, J. G. McNulty, B. F. Pearson, J. G. Rutherford, J. H. Austen, Frederick Taylor, F. H. Mason.

Mr. Mason's motion having been seconded, on motion the ballot was dispensed with, and the above named gentlemen were elected to the respective offices named.

The SECRETARY: I beg to give notice of motion to change the date of the annual meeting to the first Wednesday in February, instead of the present date. By having our meeting then we can appoint our committees, and if we have to wait on the Government in connection with any matters we can do so before the House meets.

Mr. STUART called attention to a notice of motion by J. Stevenson Brown at the meeting of the Canadian Mining Institute that the rebates to Provincial Societies be abolished, and moved that the Secretary be instructed to ask the Institute that the rebate be paid to the members of this Society entitled to same.

Mr. McNEIL seconded the motion, which was carried.

The SECRETARY also brought up the matter of refund due from the Intercolonial Railway on account of the excursion last August. He asked that a strong telegram be drafted and sent to Mr. Lyons this afternoon.

On motion the Secretary was authorized to send such a telegram to the Railway Department at Moncton.

The morning session then adjourned.

## AFTERNOON SESSION.

Having visited the Provincial Museum as arranged, the Society resumed its deliberations at 3 p.m.

THE PRESIDENT: The next thing will be the reading of a paper by Mr. George W. Stuart, which I think will be of great interest to all of us.

## A PLEA FOR A GOVERNMENT ASSAY OFFICE.

Mr. GEORGE W. STUART: For many years past I have realized the necessity of a Government Assay Establishment, and at a meeting of this Society some four years since, I suggested the formation of such an institution, for the assaying of gold bullion produced in this Province. The benefits derivable from such an institution must be apparent to every one, whether interested in mines or not: and to the metalliferous miner, particularly, the advantages must be admitted to be manifold. I am fully convinced that the advantages of such an institution as I am proposing will not be confined to the mining community, but will be far reaching, benefitting the whole Province and largely increasing the Provincial revenue.

Our Provincial mining laws, as you are aware, provide for the returns to the Government of all gold and other metals and minerals mined: therefore the public, wherever these reports are read or quoted, are led to believe this Blue Book, issued by the Mines Department, shows the whole product of the Province; when, as a matter of fact, large quantities of the gold taken from our mines are not returned at all, and the Government gets no account of it; therefore not only is the Government defrauded, but the public are deceived, and the mine, in many instances, discredited. There are several causes for this shortage in the gold returns of this Province, and they are about as follows:—1st. The miner who steals the nuggets from his employer finds an illegitimate purchaser, who pays him any price he chooses for his ill gotten gold; neither of these thieves make any returns. 2nd. Dishonest majority mine owners ship and sell much of their gold without making any returns of it, in order to defraud minority owners; and by so doing rob the Government, as well, of the royalty. 3rd. The dishonest tribute lease holder also makes returns of less gold than he obtains, in order to save both the percentage due to the owner of the mine, and to rob the Government of their "pound of flesh" as well; and the 4th. Class make returns of much less gold than they obtain, simply to save paying the 2 per cent. royalty.

From all these causes the Government lose a large amount of royalty, and the Province is credited with much less gold than she actually produces, and yet the *whole of the ore tonnage* is returned, thus causing the average yield per ton to appear much lower than it is entitled, this to the general disparagement of the industry.

These are all serious evils you will admit, and I think, at least every gold mining man here will admit they all exist.

Will the establishment of a Government Assay Office, which shall become a part of the Governmental machinery, cure these existing evils?

After giving the question, for years, the most careful consideration, I am fully convinced in the affirmative. I shall not attempt here to go into all the details necessary with the working of this suggested new department for the mines regulations, nor to forecast the probable full results from the working thereof.

On the establishment of such an office, several new clauses would be required to be added to the Mines Act. 1st. Making it compulsory for all gold to be sent to the Government Assay Office, where it will be assayed, weighed and stamped. 2nd. All gold, smelted or unsmelted, found in the possession of any person not a mine owner, or an unauthorized mine—express—or bank agent, and in course of transit to the Government Assay Office, to be confiscated and to become the property of the Government, unless such gold as has been found to have been stolen, in such cases, it shall be returned to its rightful owner.

The duties of the Government Assayer should be to resmelt and assay, or assay without resmelting, as he thinks necessary, all gold bullion produced in the Province. I say resmelt, if he thinks it necessary, this, in order to insure a perfectly homogenous ingot, and also for the purpose of detecting fake ingots, by which, I mean, an ingot with a base metal core, encased in gold. On several occasions such frauds have been practised in this Province.

When the assayer has determined the fineness and the weight of each ingot, he shall stamp the same thereon with the Government dies, both the weight and the quality, and he shall keep a record in the office of the same, and the mine from which it came, as well as the tonnage of the ore or concentrates, or gravels, as the case may be, from which it was produced, it being compulsory that such a sworn report shall accompany the gold to the office; and this shall be all the returns incumbent upon the owner to make to the Government. The royalties collectable on all gold might be paid at this office.

The maximum charge for such duties of the Government Assayer should not exceed 50 c. per lot of gold.

The next important duty of the Government Assayer, and the one from which we should expect perhaps even more beneficial general results, is that of the examination and assaying of ores and minerals at a nominal charge. These duties I should outline about as follows. 1st. To examine and give his opinion as to the nature and value of any sample of mineral taken to him and to say whether he considers it worth assaying, this duty to be free of charge to any *bona fide* resident of Nova Scotia.

2nd. To make for any bona fide resident of the Province a quantitative determination of any metal in any sample of mineral at a cost of say 50c. per metal or metaloid, thus, for example, the cost of a gold assay would be 50 cents and an assay for Gold and Copper 1.00, or the determination of iron or phosphorus, sulphur and silica in an iron ore $2.00 and so on.

I have named these nominal rates, and that discretionary powers be given the assayer as to what he shall consider to be sufficiently valuable to

warrant assaying, that such powers be given him and a small fee be charged I consider necessary, otherwise it is doubtful if he would be able to cope with the work that would be heaped upon him by worthless samples of rock sent in.

With a thoroughly competent man as chief in this office, (one in whom the public has confidence), miners, prospectors, and others interested in our mineral development, would patronize it, and with such a patronage, who can foretell the possibilities arising therefrom. Apart from British Columbia *none of the other provinces offer such inducements or possibilities as Nova Scotia.*

Now what are our sister Provinces doing in this line of advancement? Ontario established a Provincial Assay Office, at Belleville, some four years ago. At first assays were made entirely free. The office became so crowded with so many useless samples, assays of which were demanded, that a nominal charge had to be made, and diagnosis of minerals were made free, while in the latter part of last year a charge of 10c. was made for these examinations. The Assay Office, which was started in a small way, now consists of two flats of six rooms. Cabinet specimens of minerals from all over the Province are kept, each mineral being properly labelled, and pulp and rock samples from all the developed mines are kept, and may be obtained by any one at certain charges.

During the past year 1641 determinations were made at an average cost to the public of 91c. per estimation, different rates being charged for different determinations, all fees being paid in advance; besides this, 304 diagnosis of minerals were made.

The Office has been instrumental in the discovery of platinum in the Province in the form of sperrylite and arsenide of platinum. In the discovery of large deposits of mispickel, and in the revival of the manufacture of white aresenic. It has been of incalculable service to the prospector for iron ores, in determining titaniferous from non-titaniferous ores.

British Columbia has a well equipped Government Assay Department at Victoria, where last year a very large number of assays for the public were made, besides a considerable amount of work was done for the Department of Mines, including the smelting and assaying of $219.033 worth of gold. Besides this office, operated entirely by the Government at Victoria, and at Vancouver, the Government subsidizes liberally the establishment owned and operated by Mr. Pellew Harvey; a large amount of work was done in this office also. The results of the work done in these offices—the one entirely conducted by Government and the other subsidized, has been of great value and importance to the public and the Government, as they have been the means of locating many Gold and Silver Mines, and the discovery of payable quantities of platinum in the black sands of the Fraser River, also of the discovery of gold associated with tellurium in a number of districts.

I need not refer at greater length to the results achieved by these establishments in the other Provinces referred to. With such facts before us, can there be any question as to the duties of our Provincial Government, in either establishing an office conducted entirely by the Government Officials, it becoming a part of the Governmental machinery, or subsidizing an office now established, or to be established.

Should the Government adopt such a plan as I suggest, it would, I believe, practically do away entirely with the illicit gold buyer, who would be subject to a search warrant at all times, and all the gold found in his possession taken from him. No Bank, Broker, Jeweller or other person dare buy any gold unless the Government stamp were upon it.

It would be better for the small prospector and tributor who brings in small lots of gold of from 1 to 10 ounces, and often has to dispose of it at from $2.00 to $4.00 per ounce less than its value, whereas with such an office as suggested, he would receive full value for it, for after the Government stamp were on it anyone would buy it at face value.

With regard to assisting the prospector, I believe cheap assaying, of incalculable value and help in the development of the mineral resources of the Province. Even at the present prices of assaying, with the limited number who can afford to take advantage of it, it has been the means of bringing to light a new gold field of very considerable promise, at Chéticamp, in Cape Breton—a vein of hubrenite containing the valuable metal tungstan at Margaree. It has proved to us that some of our concentrates contain sufficient arsenic to at least go a long way toward paying for the extraction of the gold contained in them. It has been the means of bringing to light deposits of fire clay of considerable promise, and also of the discovery of gold in the antimony deposits at West Gore, County of Hants.

With the nominal charges such as I have suggested, who can estimate the results from the advantage that would be taken of it.

Why has not such an establishment been instituted long ere this by the Government in this oldest mining Province of the Dominion? Are we not to blame? Have we, as a mining society, been sufficiently vigilant, suggestive and aggressive in urging upon the Government the great necessity of such an institution? Applause.

The PRESIDENT: I hope that some of the members present interested in Mr Stuart's ideas in a business way will give us some remarks. From my own point of view he has touched on a subject of very vital interest to gold miners in particular and the public in general. With a well organized or even imperfectly organized system of government control of the handling of gold, such a fiasco as we have had recently in connection with the illicit selling of gold would hardly be possible.

Mr. McNEIL: The point which, perhaps, interested me more than any other was that at the end of the paper in which the question was asked, "Have we as a Society, done our duty in urging the Government to establish an assay office?" I have no hesitation in saying we have not done our duty, and that we might have done more and we should have done more in impressing its importance upon the Government. Its importance is not merely conceded by other provinces, and is not merely proved by the experience of other Provinces, but I think every intelligent man in the mining business knows it is not only important but it is one of the necessities for a speedy development and progress of the mining industry.

One of the points that might be made as to the value of this assay office would be the work of the laboratory of the Dominion Coal Company. That laboratory has added many thousands of dollars to the revenues of this province, and has done more for the extension of the coal markets of Nova Scotia than any other work that has been carried on. I leave other coal men to speak who are more experienced, but I do believe that to the laboratory of the Dominion Coal Company is due a realization of many of the various new and important uses to which our coal may be put. It is probable that the work of carrying on investigations along that line has only just begun, and that it could and should be carried out by means of the Government, which is so deeply interested in the matter of revenues and the general prosperity of the Province. I am sure that that work, if carried on, will still further expand our coal markets, to the great advantage of the Province. And so with gold. We have seen the experience recently of a large gold mine where ample capital was brought in from outside and where that capital was wasted, and I would add, wasted for want of proper information, part of which, at least, would be supplied by a properly equipped and properly operated assay office.

The matters referred to in the able paper of Mr. Stuart strike at the point where the work should be carried on. The work should be carried on so that it would enable miners to take up the treatment of gold bearing ores. The Society owes a debt of gratitude to Mr. Stuart for his valuable paper.

But the point is, how are we going to bring about this desirable object? What should we do as a Society—what work can we do, in order that it shall be brought about? If you refer to the discussion that took place during the late session of the House, you will find that the government was asked if it was their intention to establish an assay office, and that in reply the Premier said. "An assay office was something the government had not lost sight of. He had no doubt at some time not far distant we would have a well equipped assay office." Now, gentlemen, we should help the government to interpret those words, "not far distant," and we should make that not far distant mean a very short time indeed in plain English, and if we wish to do that I would suggest that this paper of Mr. Stuart's be sent to every member of the government and every member of the legislature, and I have no doubt that as a result we shall find a vote for an assay office in the estimates for the next session. (Applause).

Mr. FERGIE: I did not hear the paper read, but I had the pleasure of scanning it on the train last evening while coming to the city, and I fully indorse everything the writer has said, and also what Mr. McNeil said about furnishing a copy to every member of the government as soon as possible. The sooner the matter is taken up and forced to their attention the better.

I did not quite follow Mr. McNeil, if he will pardon me, when he said that the Dominion Coal Company's laboratory had done more than any other factor in the extension of our coal markets.

Mr. McNEIL: In extending the coal to new uses was the impression I wished to convey. I believe the experiments carried on in that laboratory with regard to the recovering of by-products from the coal resulted in the establishment of the great coke and gas works at Everett, Massachusetts, to which about 600,000 tons of our coal were shipped last year.

Mr. FERGIE: I would take it then that the laboratory was at Everett.

Mr. McNEIL. Their laboratory in Cape Breton I am instructed is a very well equipped one I maintain that their most valuable information came about in that way."

*To be continued.*

# COMPANY NOTES.

**Athabasca Gold Mine Ltd.**—From the annual report for the year ending 31st December last, we are informed:—"The produce for the year reached the figures $170,663.96, which sum was obtained from 5,054 tons of ore. In the statement of cost the entire amount expended in development (which was $29,014.48) is included in the cost of mining, and only the actual cost of new machinery, erection and buildings is included in item of "new construction." After making these charges, and adding to the produce the profits derived from sales of merchandise and other sources, the profit for the year on operation was $29,551.19. The vein has continued to present difficulties which have rendered the cost of mining high; it has been broken by faults, it has lain flat and its width has been about the same as during the previous year. For every ton of ore about four and three-fifths tons of waste have been mined, and a further amount of waste (which I am not able to estimate), has been mined and left in the worked out stopes. Under these conditions, and, although every effort has been made to conduct the work on economical lines the cost per ton is high.

**Mond Nickel Company.**—Among our illustrations this month we show a number of views of the new plant of the Mond Nickel Company at Whitefish, Ont. The mine is developed by a shaft 200 feet deep with three compartments. There are three working levels and six stopes. The mine is equipped with air drills, hoist, etc., for 400 feet. A Bleichert wire rope tram of 25 tons capacity per hour connects the Rock-house with the Roast yard and Smelter. The Smelter consists of two blast furnaces 44 in. by 120 in. of a capacity of 150 tons each for 24 hours. Two converters stands with four shells and a travelling crane and a relining machine. Power is supplied by a tandem compound condensing engine to blowers and electric generator. A blowing engine for converters, &c.

**Bruce Copper Mines.**—We publish one or two photos from Mr. Braden showing progress of construction of plant at Bruce mines. In a recent letter Mr. Braden says:—"We started with this work in October, and most of it was done during very severe fall and early winter weather, but we are in good shape now. Construction work at the mine is completed, and also, practically, at the mill, which is about a mile eastwardly from the main working shaft at the present time, though the old vein workings pass along about three or four hundred feet back of the mill. The mill is supplied from the lake with water by a compound reciprocating pump; a standard gauge tramway connects the mine with the mill. We feel that we have accomplished quite a little in a short space of time, as we were handicapped considerably both as to material and labor. Many of our heavier timbers had to be built up from two and three inch plank. As a matter of interest to you in connection with the boarding-house, I would say that this building is electric lighted, steam heated with radiators in all of the mens' rooms and running water in all of the rooms, besides hot and cold shower-baths. It is also supplied with a large reading and sitting room. I think it is a very good idea as we will be able to get a particularly good set of men, or at least I think we will as time goes on, though up to date I must say that the miners of Ontario are of a very inferior grade to what we get in the North-West."

**Canadian Gold Fields Syndicate, Ltd.**—Director's report for last year says: "One year ago, our Company owned the Sunset group at Rossland, on which a large amount had been expended in equipment and development; the "Jennie" silver-lead mineral claim, in the Slocan; six hundred and forty thousand shares of the stock of the St. Eugene Consolidated Mining Company, Ltd., and had $4,633.27 cash on hand with which to carry on operations.

January, 1901, found us in a greatly improved position.

The St. Eugene Consolidated Mining Company, Ltd., has entered the list of dividend payers, and has declared and paid a dividend of one hundred and five thousand dollars, for the quarter ending December 31st, 1900. This amounted to three per cent. on its capitalization, our share of the dividend being $19,200.00. At the end of 1900, the issued capital of our Company was $600,000.00, leaving shares of the par value of $400,000.00 still unissued in the treasury of the Company. In November last, the Board of Directors declared a first quarterly dividend of three per cent. on the issued capital stock of our company, being at the rate of twelve per cent. per annum on the par value of the shares. This dividend has been declared and paid.

In addition to the assets enumerated above, the Canadian Gold Fields Syndicate, Ltd., have acquired other valuable assets during the past year. Negotiations begun in the early spring for the acquiring of the Sunset silver-lead property, in the Slocan, and the controlling interest in the Commonwealth group of mines, near Crawford Bay, on the east side of Kootenay Lake, B.C., were delayed for over three months, owing to my serious illness. In the month of June last, the "Sunset" property near Whitewater, B.C., on the line of the Kaslo and Slocan Railway, was taken on a bond, for $30.000.00, the bond to run until June 1st, 1901, without any cash payment in the interval, but stipulatiag for continuous work on the property by at least four men. Mr. W. H. Jeffery, the Company's Mining Engineer, reported strongly in favor of taking a bond on this property, and he was put in charge of its development. His report to the Directors gives details of the work done and results attained.

In August last a bargain was made with the owners of the Commonwealth group of mines for the acquiring of a substantial interest in those properties. A new company has been incorporated uuder the Laws of British Columbia, known as "The Commonwealth Mines, Limited," with a capitalization of 1,500,000 shares of the par value of one dollar each. Of this amount, one million shares were placed in the treasury of the Company, the owners of the property receiving five hundred thousand shares in full payment for the group, which consists of three full claims and two fractions. The Canadian Gold Fields Syndicate, Ltd., have acquired four hundred thousand shares of the stock of the Commonwealth Mines, Ltd.; five thousand dollars has been placed in the treasury to be expended on the property.

The claims are all Crown granted and titles perfect. Development work was resumed on these properties in September last and continued until late in November, with very gratifying results. Work will be resumed early in the spring and pushed vigorously during the year. Already a large body of high grade ore has been opened up, and I have no hesitatiou in saying that the Commonwealth group gives every promise of making one of the big paying mines of British Columbia.

About the first of November last, a bargain was made with the owners of the True Blue group of copper mines, near Kaslo, B.C., whereby the Canadian Gold Fields Syndicate, Ltd., acquired the controlling interest in those properties. A Company has been incorporated under the laws of British Columbia, known as "The True Blue Copper Mines, Limited," with a capitalization of 1,500,000 shares of the par value of ten cents each; of this amount, 800,000 shares were placed in the treasury of the Company, and the owners of the property received six hundred thousand shares in full payment therefor. The Canadian Gold Fields Syndicate, Ltd. have acquired four hundred thousand shares of the stock; the sum of five thousand dollars has been placed in the treasury to be expended in the incorporation of the Company and the development of the property. A large amount of development work has already been done on the True Blue group, disclosing a good sized chute of high grade copper ore. Two car loads of this ore were shipped by the former owners to the Hall Mines Smelter, at Nelson, B.C., the smelter returns being 10.4 per cent. copper and 12 1 per cent. copper per ton for the respective carloads. This was very high grade ore, and our Mining Engineer has every confidence that the True Blue group will be speedily developed into a regular shipping mine.

In addition to the above valuable assets, the Canadian Gold Fields Syndicate, Ltd., on the first day of January, 1901, had $22,845.28 cash on hand, and amounts accruing due on stock and bills receivable to the extent of $8,100.00, making $31,945.28 available for the carrying on of the operations of this company.

In April last I recommended the suspending of operations at the "Sunset No. 2" group at Rossland. This was done, because the results of development work had not been up to our expectations and because it was felt that our funds could then be more profitably employed in other fields. Permit me to say, however, the suspension of work on the "Sunset No. 2" group by no means lessens my faith in that property. I shall expect to see that property developed into a paying mine, and am looking forward to see the time when operations will again be resumed on our Rossland property.

A word or two regarding the St. Eugene Consolidated, in which the Canadian Gold Fields Syndicate, Ltd., are so largely interested, may not be out of place here.

The St. Eugene Consolidated is now equipped with a concentrating mill of a daily capacity of four hundred tons, being double the size of any other concentrating mill in Canada. The property is so well developed that there is now considerably over two years' ore supply blocked out, in sight, and new ore reserves are being steadily developed. The St. Eugene Consolidated is now shipping from 2,500 to 3,000 tons of silver-lead concentrates per month, and besides earning and paying a dividend of three per cent. per quarter, has a large cash surplus on hand.

At the present market price of the St. Eugene Consolidated shares, our holdings in that company are worth more than the total issued capital of the Canadian Gold Fields Syndicate, Limited. This fact, taken in connection with our other large and valuable assets, shows the strong financial position of our company.

**Anglo-Canadian Gold Estates.**—Annual General Meeting held London March 26. On Elizabeth claim in Seine River District outcrop averages about 6 feet in width with an average value of about $20 per ton. Development on this claim, which is only one of the Company's holdings, consists of shafts down 92 feet, with a level at 80 feet, in north 22 feet, south 44 feet. South drift is in ore which is estimated will yield about $7 per ton free gold. Total amount development is 250 feet, but contracts have already been let for 420 feet more. A Bullock Diamond Drill is used for prospecting. One bore hole has already encountered vein at depth of 200 feet, the ore here is 4 feet wide and assays $37. According to Mr. Alan Sullivan, General Manager, cost per foot of diamond drilling is only $125, certainly a very low figure for the formation passed through—granite and schist. The drill is worked by a force of six men in three shifts of eight hours each. The Company is making provision for erection of stamp mill soon as Canadian Northern Railway, now building, reaches the location.

**Bullion.**—This American Company owning location 263p 3 miles east Rat Portage has let contract for 300 feet shaft 8x8 in the clear. The coming season promises to see a revival of former activity in this section as at least two other Companies owning locations there are preparing to begin operations almost immediately.

**Granite Gold.**—This English Company is about to be wound up so it seems. It was floated in 1899 with every prospect of a successful future. At the Annual Meeting four months ago every assurance was given that everything was right. The Duncan Mines Ltd. (the vendors) and the Bank of Montreal were the only creditors, the latter institution to the extent of about $14,000, certainly not a large sum. The impending collapse, if collapse it is to be, is due to differences between the vendors, who accepted shares in payment, and the present Company. A writ for $100,000 was served on the Company by the vendors, and that it seems gave reason for the proposed liquidation. It is to be hoped that the differences between the two Companies will be amicably settled for otherwise what holds out every hope of proving a profitable undertaking will simply be added to the list of good Canadian properties gone wrong through no fault of the mine, the ore or the values.

**Molly Gibson.**—Latest information states that contract has been let for the further extention of No. 5 Tunnel 200 feet. This work is to be undertaken at once and continued in double shifts. Reports by two engineers state that at a conservative estimate the amount of ore in sight amounts to $400,000, which at present cost of extraction, shipping and smelting should net at least $150,000. They further state that if No. 5 Tunnel taps the same ore bodies as found in Nos 1, 2, 3 and 4 Tunnels (of which there seems to be no doubt) the amount of ore then exposed should amount to fully $1,000,000. They have accordingly recommended the Company to defer settle-

ment of question of best method of treatment until No. 5 Tunnel has tapped the ore bodies. It would be, in their opinion, impossible to state at the present whether a concentrator or a smelter would be the better suited to the economical treatment of the ore. If concentrator should be decided upon an electric tram line would be constructed over the Company's graded wagon road to connect lower terminal of aerial tramway and the Company's wharf on Kootenay Lake, a distance of 7 miles. A water power has been secured from which power for concentrator or smelter and also for tram line will be generated.

# NEW COMPANIES.

The following are the recent incorporations of mining companies in the various provinces of Canada :

## ONTARIO.

Golden Star Mining Co., Ltd.—Incorporated 16th January, 1901. Authorized capital, $1,500,000. Head office, Toronto, Ont.

Deer Trail Consolidated Mining Co.—Incorporated 7th Feb., 1901. Head office, Toronto, Ont. Secretary and attorney, Alex. M. Colquhoun, Toronto.

Grey and Bruce Oil and Gas Co., Ltd.—Incorporated 20th Feb., 1901. Authorized capital, $100,000. Head office, Hepworth P.O., Amabel, Ont.

Formosa Oil Company, Ltd.—Incorporated 28th February, 1901. Authorised capital $10,000. Head office, Formosa, Ont.

Sakoose Gold Mining Co., Ltd.—Incorporated 9th March, 1901. Authorized capital $500,000 Head office, Ottawa, Ont.

Imperial Corundum Company, Ltd.—Incorporated 13th March, 1901. Authorized capital $1,000,000. Head office, Toronto, Ont.

Westport Mining and Development Co., Ltd.—Incorporated 13th March, 1901. Authorized capital, $50,000. Head office, Westport, Ont.

Rush Bay Golden Horn Mining Co., Ltd.—Incorporated 18th March, 1901. Authorized capital, $250,000. Head office, Rat Portage, Ont.

London & Canadian Mining and Development Co., Ltd.—Incorporated 21st March, 1901. Authorized capital, $10,000. Head office, Brantford, Ont.

International Mica and Mining Co., of Ottawa, Ltd.—Incorporated 10th April, 1901. Authorized capital, $15,000. Head office, Ottawa, Ont.

Ottawa Mica Mining Co., Ltd.—Incorporated 12th April, 1901. Authorized capital, $100,000. Head office, Ottawa, Ont.

Honor Bright Gold Mining Co., of Ontario, Ltd.—Incorporated 17th April, 1901. Authorized capital $1,000,000. Head office, Berlin, Ont.

Desbarats Mining Co., Ltd.—Incorporated 23rd March, 1901. Authorized capital, $550,000. Head office, Desbarats, Ont.

## BRITISH COLUMBIA.

True Blue Copper Mines, Ltd.—Incorporated 4th January, 1901. Authorized capital, $150,000. Mines office, True Blue Mountain, Ainsworth District, West Kootenay, B.C.

Carroll's Quesnelle River Leases, Ltd.—Incorporated 11th Feb., 1901. Authorized capital, £10,000. Head office, C. A. Holland, 40, Government street, Victoria, B.C.

Atlin Mining Company, Ltd.—Incorporated 13th February, 1901. Authorized capital, £75,000. Head office, R. G. Tatlow, Vancouver, B.C.

Bonanza Hydraulic Company, Ltd.—Incorporated 13th March, 1901. Authorized capital, $100,000.

British Columbia Pyrites Co., Ltd.—Incorporated 13th March, 1901. Authorized capital $50,000.

Thistle Gold Company, Ltd.—Incorporated 18th March, 1901. Authorized capital, $100,000.

Fisher Maiden Troy Mines, Ltd.—Incorporated 22nd March, 1901. Authorized capital $150,000.

White Mountain Mining Co., Ltd.—Incorporated 22nd March, 1901. Authorized capital $150,000.

## NEW BRUNSWICK.

Golden Nugget Mining Co., Ltd.—Authorized capital $300,000. Head office, Fairville, St. John, New Brunswick.

## Mica as an Insulator

It has been demonstrated that oil has a bad effect on the insulating property of mica. Mr. T. O. Maloney, in the *Electrical Review*, says that a piece of best Indian mica was placed between two planed surfaces, and withstood an insulation test of 16,000 volts alternating current without fracture. The current was then removed, and the surface of the mica lightly coated with paraffin surfaces. Under this condition it was found that it would break down at 9,000 volts alternating current. Another piece of Indian mica tested at lower voltages, and under the same conditions as above, was found to withstand 8,000 volts alternating, dry, and, when oil was applied, to break down at 4,000 volts alternating current. On the other hand, the surface of the mica can be coated with water and the insulation of the mica will not be lessened.

# YMIR GOLD MINES, LIMITED.

The following is excerpted from the last annual report recently issued "It is with much satisfaction that the Directors are able to refer to the fulfilment of the scheme for doubling the output of the Mine without having had recourse to any increase of the capital of the Company, the profits made having been more than sufficient to defray the whole of the expenses in connection therewith.

Owing principally to delays in the delivery of the material it was found impossible to have the new 40 stamp battery ready for operations until the latter end of June, and it was not for some two months later that the complete mill of 80 stamps was able to commence work.

Reference to Mr. Fowler's Report will show that the milling work done during the year was equal to 80 stamps working 216 days 10 hours, whereas the present full capacity of the mill, upon the basis of working 22 hours per day, is 55 per cent. more.

The accounts presented show that after writing off £5,606 12s. 3d. for development, depreciation, interest on loan raised for the new plant, and charging against the year's revenue the whole of the heavy administration and other charges consequent upon the additional machinery, etc., including extensive repairs to the old battery, a net profit of £30,928 5s. 7d. remains, which, added to the £10,030 18s. 9d. brought forward from the 1899 accounts, makes a total of £40,959 4s. 4d.

As the greater part of this profit has been re-invested in the mine it was not available for distribution, and consequently the balance is carrid forward, and an interim dividend of 1s. per share was declared at the end of January on account of the profits for the current year.

The carrying out of the important additions to the battery and mine, necessitated a complete reorganization of its working arrangements during the continuance of mining and milling operations, occasioning unavoidable delays, which not only increased the working expenses but reduced the output. Under these circumstances the Directors regard the result of last year's work with gratification.

At the end of the year the Ymir shaft had reached a depth of 258 feet below No. 3 level, or about 650 feet below the surface. Crosscuts were made at the 4th and 5th levels where the width and value of the vein has been proved to be well maintained. At this date also the 1,000 feet adit level had penetrated the hill 596 feet and is advancing at the rate of 125 feet per month, and should therefore reach the vein by the end of the current year, some four months before it is possible to work out the reserves above No. 3 level.

It will be observed that Mr. Fowler reports the vein above No. 3 level to be wider than he had originally calculated upon, thus increasing his estimate of the ore reserves.

Considerable time and attention has been devoted to the question of applying the cyanide process for the treatment of the mill tailings. Tests upon a fairly large scale have been made by Mr. Fowler and his assistant, Mr. Holden, with a satisfactory result, and a small plant for treating 10 tons daily should now be in operation.

### ENGINEER'S REPORT.

Some interesting facts are brought out in Engineer Fowler's report from which we quote :—

The new battery of 40 stamps was put in operation a little before 1st July, but during June the whole mill was hung up for practically three weeks in order to connect the new and old parts and re-arrange shafting and various parts of the plant. During July and August the old battery was being extensively repaired, and during the latter month we suffered from an accident to the engine, at a time when the water for power was at a very low stage. Again in November the heavy countershaft through which the water and steam power systems join, was broken. All of these, together with other delays, such as are caused by freezing and accidents to the flume line, have made our mill record one not to be looked upon as an example of what we may hereafter expect.

The monthly crushings were as follows :

| | | | | |
|---|---|---|---|---|
| January ..... | 40 stamps | 22 days | 7 hours | 2,160 tons. |
| February.... | ,, | 23 ,, | 0 ,, | 2,263 ,, |
| March ..... | ,, | 27 ,, | 2 ,, | 2,682 ,, |
| April..... | ,, | 29 ,, | 2 ,, | 3,000 ,, |
| May..... | ,, | 30 ,, | 7½ ,, | 2,990 ,, |
| June ..... | ,, | 9 ,, | 2½ ,, | 892 ,, |
| July..... | 80 stamps | 23 ,, | 19½ ,, | 4,650 ,, |
| August..... | ,, | 20 ,, | 9 ,, | 4,100 ,, |
| September .. | ,, | 28 ,, | 16½ ,, | 5,730 ,, |
| October..... | ,, | 29 ,, | 3 ,, | 5,630 ,, |
| November ... | ,, | 18 ,, | 12 ,, | 3,663 ,, |
| December.... | ,, | 25 ,, | 11½ ,, | 4,900 ,, |
| Total.... | 80 stamps | 216 days | 10 hours | 42,660 tons. |

Average per 24 hours, 197.10 tons, or 2,464 tons per stamp per day, as compared with 2,485 tons during 1899. This difference against 1900 is principally, if not entirely, due to the increased hardness of the quartz.

The cost of mill operation during the year was 66 cents, and of repairs 24, making a total of 90 cents. As compared with 1899 (76¼ cents), the increase of 13¾ cents is due principally to repairs, and partly to the fact that 40 shoes and dies, supplied with the original mill, were not taken into account as supplies, but the actual operating labour during 1900, including the share of extra cost incurred by running the steam plant, was three cents per ton less than in the preceding year. We confidently expect to show a considerable decrease for 1901.

*Tramway.*—The duplication of milling plant created the necessity of altering the wire tramway plant. This was effected by the introduction of

a better loading device, and the provision of larger buckets. Operation for the year shows a good saving, the cost being 7¾ cents per ton, while in 1899 it was 15½. This difference, however, is laregly due to the greatly increased tonnage handled with a labour increase of only one-third. The total cost per ton during 1900 was 10.76 cents, and this amount includes the cost of two new cables, one of which proved to be of very poor material and had to be discarded after carrying about 20,000 tons. Had this not been the case the year s cost would have been reduced by three cents per ton.

*General Expenses.*—Under this head there has been an unavoidable and considerable increase, and the largest item is $4,281 for the British Columbia Government Mineral Tax on our output. This tax was formerly 1 per cent. and since July 1st, 1900, has been 2 per cent. of the value at the mine; and although our mining costs are as low as we think it possible to make them, the amount paid for the year is very nearly 2½ per cent of our operating profits, and since 1st July, on the present basis, we are actually taxed 3½ per cent. of our profits before allowing anything for depreciation or London expenses. Per ton of ore milled, this tax item amounts to 10 cents, and all other general, office, salaries and contingent charges to about 40 cents.

*General Remarks.*—It will be noted that we have shipped but a small amount of crude ore during the year, viz., 83 tons. This is owing to the fact that the ore body from which we shipped in 1899 (385 tons) has been exhausted, and it is seldom that we now find material in which the values are sufficiently concentrated to make it worth while sorting.

We expect to have our experimental cyanide plant, of ten tons daily capacity, in operation 1st February, and trust that the results will justify our advising the construction of plant to handle 150 tons or more.

During the year several cottages have been built for married employees at the mill, and these are bringing in a fair rental, while the accommodation and convenince afforded appear to be much appreciated by the occupants.

Beginning the new year, the rates for smelting our concentrate were increased by one dollar per ton, while the price paid for lead has been decreased by 30 cents per hundred pounds This means a decrease in returns of about $2.15 per ton of concentrate, and probably will amount to $10,000 less than would have been received under the rates which prevailed during the two years past.

PRODUCE OF THE MINE.

| | | | |
|---|---|---|---|
| Milling ore stoped.... | 41,643 tons. | Ore Milled..... | 42,660 tons. |
| Milling ore from shaft. | 1,339 " | Crude Ore..... | 83 " |
| Crude Galena..... | 83 " | On hand in Mine..... | 322 " |
| Total..... | 43,065 " | Total..... | 43,065 " |

QUANTITIES AND VALUE OF PRODUCT.

| | Ozs. | Gold Ozs. | Silver Ozs. |
|---|---|---|---|
| Bullion..... | 23,063 | 12,036.625 | 8,730.13 |
| | Tons. | | |
| Concentrate..... | 2,950 | 3,327.830 | 36,717.23 |
| Crude Ore..... | 83 | 219.822 | 1,411.88 |
| Totals..... | | 15,584.277 | 46,859.24 |
| Average per ton..... | 42.743 | 0 3646 | 1.096 |
| " 1899..... | 17.522 | 0.4812 | 1.425 |

| | Lead lbs. | Gross Value. | Value P. T. |
|---|---|---|---|
| Bullion..... | | ‖ 254,098.80 | † 5.944$ |
| Concentrate..... | 1,265,738 | * 119,467.13 | 2.7950 |
| Crude Ore..... | 36,248 | * 6,046.10 | 0.1415 |
| Totals..... | 1,301,986 | $379,612.03 | $8.8813 |
| Average per ton..... | 1.523% | | 8.8813 |
| " 1899..... | 1.863 | $209,145.33 | $11.94 |

‖ All gold at $20.67 per ounce; all silver at market price.

* 95% gold at $20.00 per ounce; 95% silver at market, 90% lead at M.

† Corresponding figures in last Annual Report were exclusive of express, freight and smelting charges.

AVERAGE RECOVERY FROM MILL FEED PER TON, FOR 1900 and 1899.

| 1900 | Oz. Gold. | Oz. Silver. | % Lead. | Gross Value $ |
|---|---|---|---|---|
| Bullion..... | 0.2822 | 0.2046 | | 5.9560 |
| Concentrate..... | 0.0780 | 0.8607 | 1.474 | 2.8004 |
| Total..... | 0.3602 | 1.0653 | 1.474 | 8.7564 |
| 1899 | | | | |
| Total..... | 0.3965 | 0.8930 | 1.114 | 9.4607 |
| Concentrate..... | 0.0702 | 0.6680 | 1.114 | 2.5887 |
| Bullion..... | 0.3263 | 0.2250 | | 6.8720 |

The former table very well illustrates the effect of the rich carbonate and galena ores shipped during 1899. The table of mill feed recoveries shows a net decrease of about 70 cents per ton; the decrease of bullion recovery of $0.916 having been partially offset by an increase in concentrate of $0.2117. The condition of the ore which partly accounts for this is further reflected in the statement that whereas, in 1899, 82.3 per cent. of the mill ore recovery of gold was in bullion, it was, during 1900, only 78 3 per cent. This percentage may of course still further be decreased as the volume of material treated from the lower levels increases; still it is expected that any increased degree of refractoriness will be more than compensated by our cyaniding operations.

COSTS PER TON (42,743 TONS).

MINING.

| | Labour. | Other charges. | Totals. |
|---|---|---|---|
| Stoping..... | $1.4483 | $0.3561 | $1.8043 |
| *Development..... | 0.2425 | 0.0570 | 0 2995 |
| Repairs..... | 0 0187 | 0 0143 | 0.0329 |
| Totals..... | $1.7095 | $0.4274 | $2.1367 |

MILLING.

| | Labour. | Other charges. | Totals. |
|---|---|---|---|
| Operation..... | $0.3670 | $0 2930 | $0.6600 |
| Repairs..... | 0.1823 | 0 0573 | 0.2396 |
| Totals..... | $0.5493 | $0.3503 | $0.8996 |

TRAMWAY.

| | Labour. | Other charges. | Totals. |
|---|---|---|---|
| Operation..... | $0 0767 | $0.0010 | $0.0777 |
| Repairs..... | 0.0096 | $0.0202 | $0.0299 |
| Totals..... | $0.0863 | $0.0212 | $0.1076 |

* Other than No. 10 Adit and Ymir Shaft.

SACKING AND TRANSPORT TO YMIR STATION.

| | Labour. | Other charges. | Totals. |
|---|---|---|---|
| | $0.0399 | $0.1627 | $0.2027 |
| Express, Freight and Smelting.... | | | 0.9901 |

OFFICE, ASSAYING, ETC.

| | |
|---|---|
| Salaries..... | $0 1558 |
| Telegrams and postage..... | 0.0138 |
| Assaying..... | 0 0131 |
| Office supplies..... | 0.0073 |
| Travelling..... | 0.0278 |
| | $0.2198 |

CONTINGENT.

| | |
|---|---|
| Exchange..... | $0.0091 |
| Insurance..... | 0.0386 |
| Legal charges..... | 0.0031 |
| Taxes..... | 0.1002 |
| General..... | 0.1327 |
| | $0.2837 |

SUMMARY.

| | Amount. | Cost per ton. |
|---|---|---|
| Mining..... | $91,327 48 | $2.1367 |
| Milling..... | 38,451 93 | 0.8996 |
| Tramway..... | 4,597 29 | 0.1076 |
| Transport, &c..... | 8,662 44 | 0.2027 |
| Salaries and office..... | 9,397 24 | 0.2198 |
| Contingent and general..... | 12,125 09 | 0.2837 |
| Freight and smelting..... | 42,319 04 | 0.9901 |
| Total..... | $206,880 51 | $4.8402 |
| Total omitting freight and smelting..... | | $3.8501 |

Comparison of these costs and the total of $3.85 per ton for all operating expenses, except smelting, with the figures given in our last annual report, wherein the total cost per ton was shown to be $3 32, appears to manifest an increase of 53 cents per ton during 1900; but it must be remembered that the mining costs per ton of mill feed during 1899 were much reduced on account of our having had at that time over 5,000 tons of ore on the dump, the cost of producing which was partly incurred by the venders of the property, and partly was included in development. As a matter of fact, had all the ore which was milled in 1899, been stoped the total costs would have been almost exactly the same as in 1900.

On the whole, I am glad to say that the present condition of the property and plant is excellent; and that while there is always the possibility of geological disturbance below our lowest workings, there has been thus far little if any couse for anxiety as to the future, in this respect. The outlook therefore seems to be a very bright one, and the general situation one on which I think the Company is to be congratulated."

# LAKE OF THE WOODS.

*Sultana*—This property is looking better than at any time in its history. The mill is now running 16 hours per day on rock from development. The management expects to start stoping May 1st. The mill will then run full time. The mine has reserves of ore in sight for three years for present mill of thirty stamps.

*Pine Portage.*—This mine, one of the oldest in the district, which has unfortunately been tied up for many years by litigation, has been purchased by Hamilton parties and will be reopened as soon as the Lake is open.

*Champion.*—Work will be resumed upon this property during the month.

*Gold Panner*—This property, upon which is a ten-stamp mill, will resume operations on the opening of navigation.

*Nine Mine.*—The manager of this mine is expected back every day to resume operations on this property, which is regarded by the knowing ones as one of the best things in the Sturgeon Lake District.

*Little Bobs.*—This property, on Denmark Lake, is now under option for a large figure to a wealthy American, who will examine it on the opening of navigation.

*The Golden Horn*—An eastern company, composed mostly of Montreal capitalists, has taken over this property and will commence operations on the opening of navigation.

*The Wendigo.*—This property, upon which a good deal of development has been done, and from which over a thousand tons of ore were shipped to the Keewatin Reduction Works will be examined this month by John E. Hardman, the eminent mining engineer. A favourable report will mean the immediate resumption of operations.

*Triggs Mine.*—A reorganization of this company will be shortly completed. It is to be hoped that the new company will be able to secure competent management for their property.

*Mikado.*—This property is looking well The mill is running full time, and sinking in two shafts goes on uninterruptedly with good ore in each. Another of the rich bunches for which No. 2 vein is famous was encountered last month. A half ton of this ore was put through the mill and produced $1000.

### Eagle Lake.

*Hughes Mine.*—This property, which is being developed by Minnesota people, has a shaft down 70 ft, with a drift at the 50 ft. level measuring 100 ft from breast to heart. The vein varies from 2ft. 6in. to 6ft., lies between good walls, and often shows visible gold.

*Baden Powell.*—This prospect within the last few weeks has produced a large number of specimens of gold bearing quartz that will bear comparison with the richest specimens ever produced. A very fine collection has been sent to the Pan American Exhibition.

### Sturgeon Lake.

A rush of prospectors is expected this summer to the new Eldorado. The Symes-Dawson are putting in a ten-stamp mill. The Shires locations will both be vigorously worked this season, and Mr. Steele will put in steel drills and open up his mammoth reef.

### Seine River.

*Golden Star.*—It is expected that this property will resume operations as soon as the weather permits.

*Olive.*—This property will resume as soon as navigation opens so that a new boiler which is now in Winnipeg can be added to the battery at the mine.

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An exceptionally fine showing of the ores of Western Ontario will be made at the Pan American Exhibition. A good deal of interest has been taken by people in this district, and visitors to the great fair will see an exhibit of ores that will compare favourably with those from other countries, and an exhibit of which Canadians will be proud.

### Manitou.

*The Big Master* is working a full crew of men, and will complete the stamp mill of which the foundations were put in last Fall as soon as the weather permits.

*Lower Nepawa.*—This property has been purchased by New York parties, who will develop the property at once.

*The Reliance Mining Company*, which last year took over the Independence Mine from the Manitou Lake Co., will erect the ten stamp mill which is already on the ground as soon as navigation opens.

Those interested in the success of the mining industry in general are looking forward hopefully to the opening of navigation, when it is believed there will be a considerable revival of mining work, both in the Lake of the Woods, and in the Wabigoon and Manitou regions.

It is reported that a good body of quartz,—panning freely,—has been struck in the south crosscut of the *Homestake Mine.*

After the *Stella* shaft had been sunk 25 feet further work was abandoned by the Americans who had the option and the same happened at the *Mammoth*, north of Black Sturgeon Lake, only that 55 feet had been sunk on it. These operations have been very disappointing.

The steady shipments made from the Sakoose mine since the Ottawa Gold Milling and Mining Co, took the property over from Messrs Watson and Munro, have entitled this mine to be ranked among the regular bullion producers of the district, and it is the one property in this vicinity which has been worked continuously ever since the first shaft was commenced.

Sinking in No. 1 shaft is being continued down to the third level, drifts having been commenced on the second.

The usual quota of cars of ore leave the Sakoose for Keewatin weekly.

Mr. Paul Gasse who is manager at the Sairey Gamp mine on the Manitous was in town this week and in a report of an interview *The Rat Portage Miner* says the shaft at the *Sairey Gamp* is now getting down to the second level, and that the cross-cut has exposed a large body of quartz.

The *Gold Standard*, has now a shaft down 80 feet in quartz with a good foot wall. The vein is a wide one.

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### Canadian vs. United States Steel Manufacturers.

Mr. A. J. Moxham, general manager of the Dominion Iron and Steel Company, is evidently not at all discouraged by the movements of the great steel combine in the United States; on the contrary, he believes that Canada will manage to oust the American steel makers from their present leading position. He claims that in competition in the world's markets, the new works at Sydney, Nova Scotia, have an advantage of fully 25s. per ton over Pittsburg. The ore used at these works comes from Belle Isle, Newfoundland, and has to be shipped a distance of 402 miles, the cost of transport to the ore piles at Sydney being 1s. 8d. per ton. This ore contains 52 per cent. of iron. Extremely pure lime for flux is delivered at Sydney at a cost of 7½d. per ton for freight, whilst the coal is obtainable on the spot Hence the cost of assembling the materials necessary for producing one ton of pig iron is said to be 3s. 3¾d., whilst the corresponding figure for Pittsburg, in spite of the enormous sums expended in facilitating transportation, is said to be not less than 1cs. 2¾d. Sydney, being on the seaboard, has much greater facilities than Pittsburg for shipment of its products to all over-sea points.

BOUNDARY'S BIG TONNAGE.—A local paper figures the Boundary ore tonnage for the first three months of the year as 75 910 tons. Of this amount 65,058 was treated by Boundary smelters. The balance, from the B C. mine, in Summit camp, was sent to Trail. The total shipments for last year amounted to about 100,000 tons, and for 1921 it is anticipated it will run up to fully 300,000 tons.

ROPES.—The importance in mining of the work performed through the application of ropes, demands that the material of which they are made shall be such as to enable them to bear successfully, and for a satisfactory time, the varied and constant strains to which they are daily subject and in order to fill these requirements, steel—such as Bessemer Steel, Langs Patent Steel, and Plough Steel—is now commonly employed for their manufacture. Mining ropes are always thicker for winding than for haulage purposes, and in order that all ropes shall be sufficiently strong for the work they have to perform, it is common to employ a factor of safety, or safe working load sufficiently below the breaking strain of the rope, and such factor of safety may be defined as the ratio that the breaking strain bears to the safe working load. The factor of safety varies according to the work the ropes have to perform, and it is common to employ factors of safety for winding ropes varying from ⅛ to ⅛ of the breaking load, and for haulage ropes it is common to emoloy as a factor of safety ⅙ of the breaking load.

Coal consumption in blast furnaces varies with the amount of moisture in the air. In a discussion before the Pittsburg Foundrymen's Association it was stated that under normal conditions—with the temperature at 70 Fahr. —1,000 cubic feet of air, equal to 75 pounds, contain one pound of moisture, and that each pound of moisture requires one additional pound of coke. Tests have proved that when the air is charged with moisture, from 200 pounds to 300 pounds more coke are required for producing a ton of iron than when the air is dry and comparatively little moisture is blown into the furnace. Heating the air does not eliminate the moisture.

# PROVINCE of QUEBEC

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

# GREAT MINERAL TERRITORY

**Open for investment in the Province of Quebec.**

---

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

## ORNAMENTAL AND STRUCTURAL MATERIALS IN ABUNDANT VARIETY.

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

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Mining concessions are divided into three classes :—

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

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

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

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

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

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

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

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

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

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

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

**The fullest information will be cheerfully given on application to**

## THE HON. THE COMMISSIONER OF COLONIZATION AND MINES,

**PARLIAMENT BUILDINGS, QUEBEC, P. Q.**

# 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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**3—Courses in Chemistry, Assaying, Mineralogy,**

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

**4—Post-Graduate Course for the Degree of**

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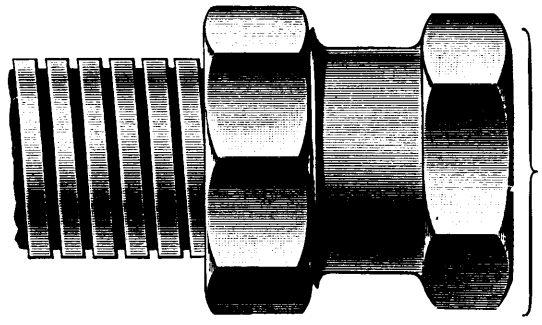

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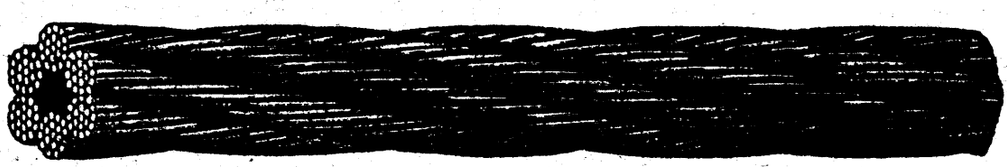

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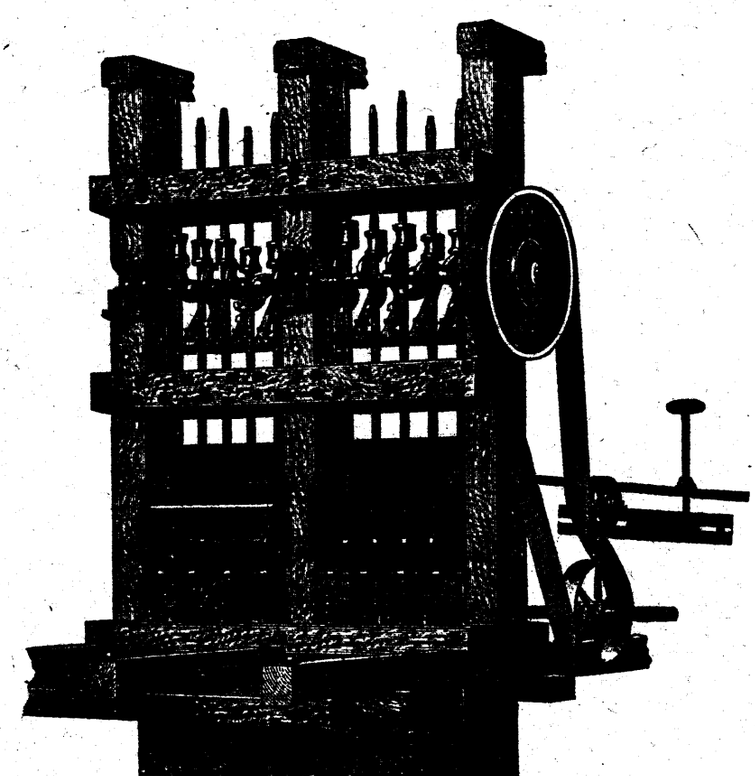

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