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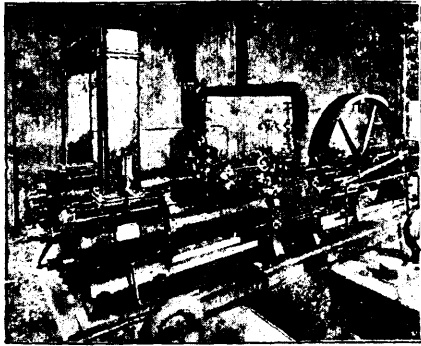
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MONTREAL—OTTAWA—HALIFAX.

OCTOBER, 1896.

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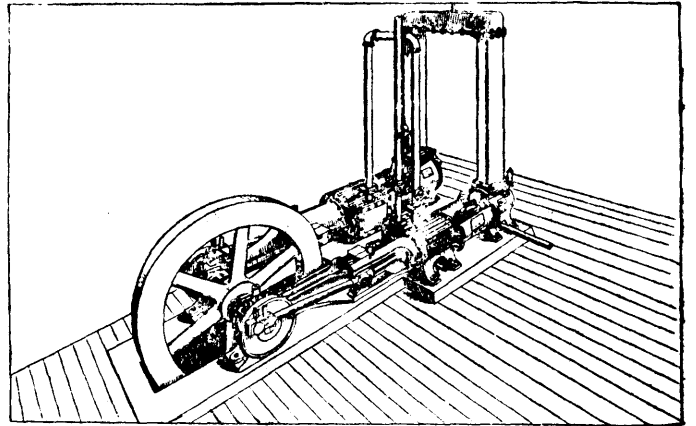
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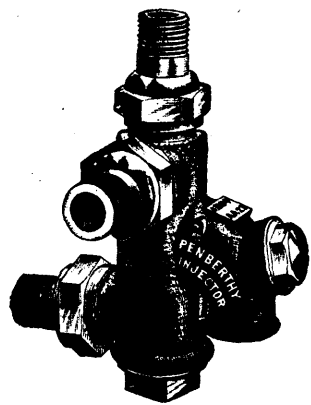
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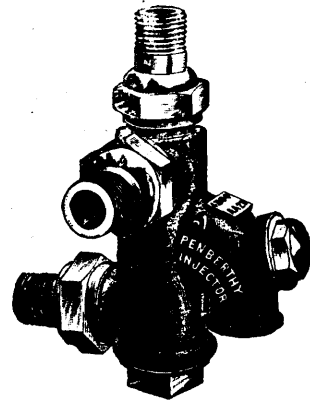


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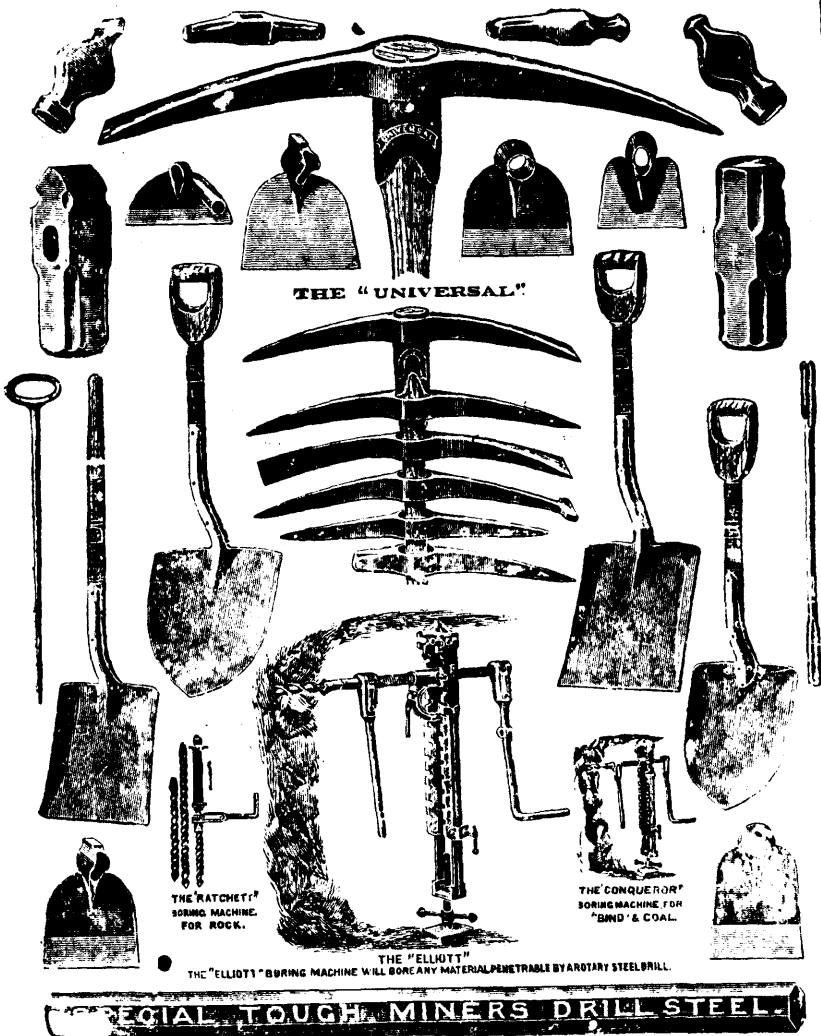
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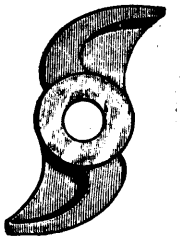
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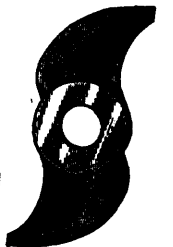
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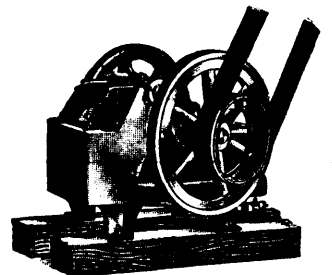
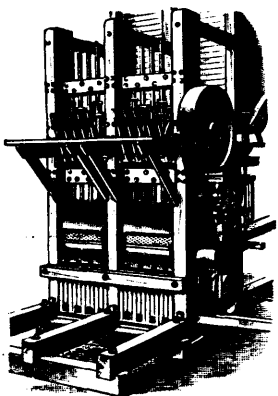
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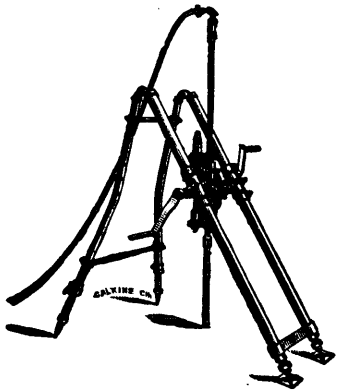
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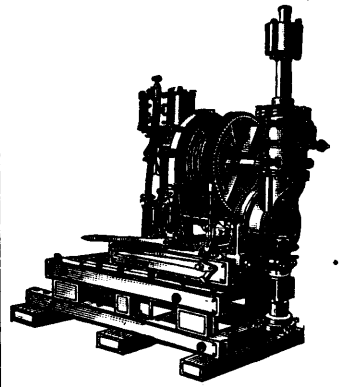
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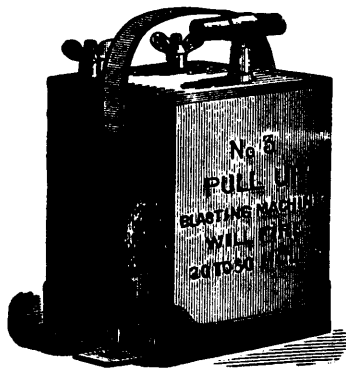
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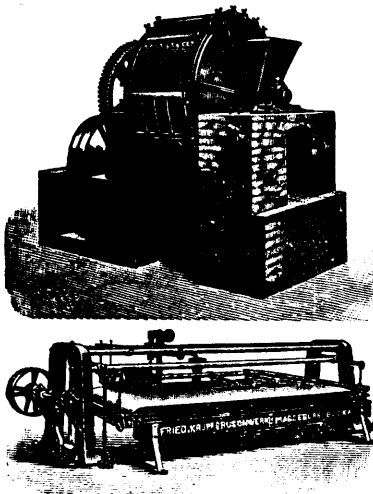
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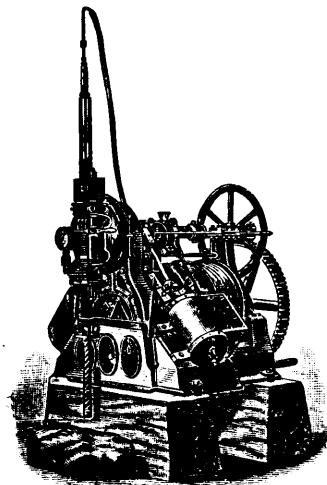
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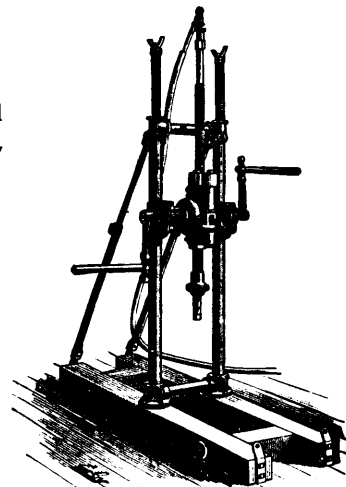
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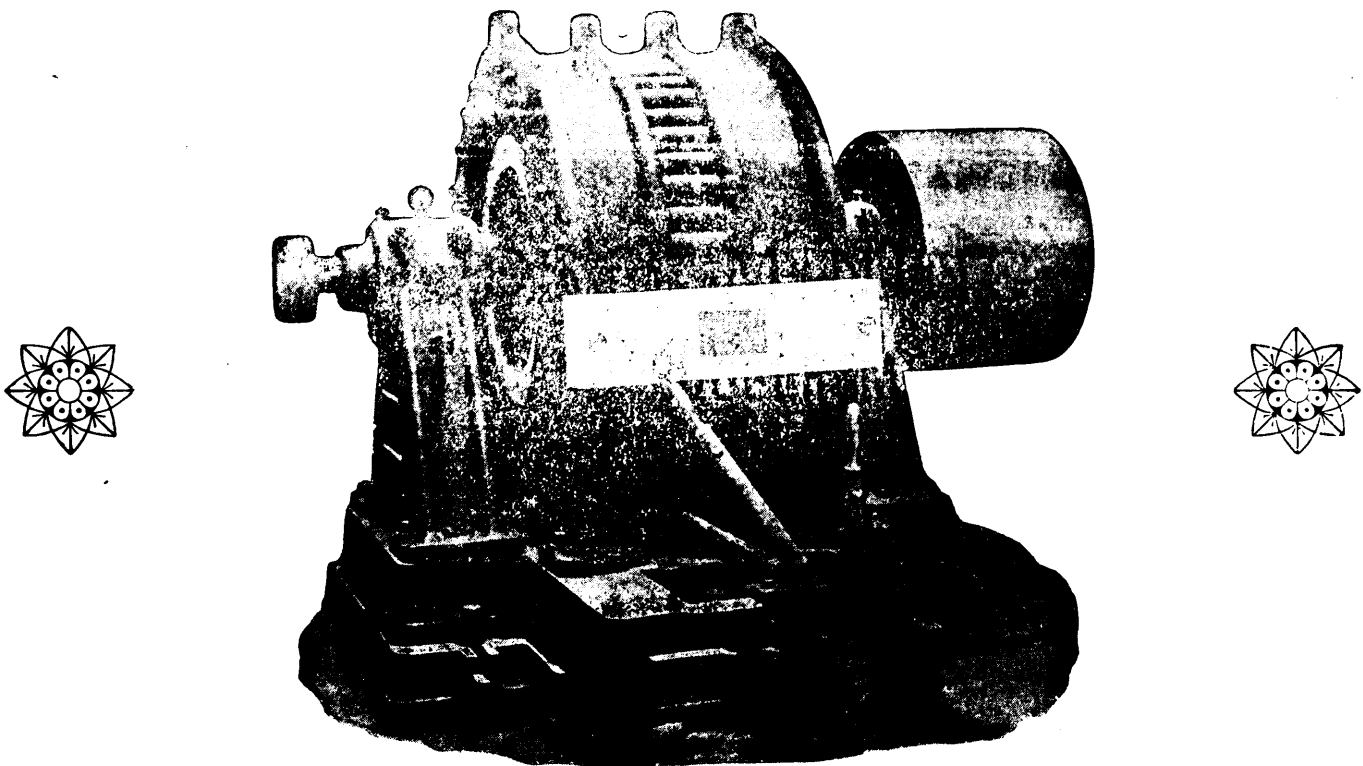
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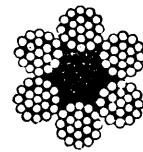
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What is a Share Certificate of an Incorporated Joint Stock Mining Company?

Here is one issued by the Big Fortune Joint Stock Mining Company somewhere in the British Columbia Mountains, purporting that the Company possesses one million of dollars in 100,000 shares of \$10 each; that the Honorable Mr. so and so is President, and certain other Honorables Directors, with an Esquire for Secretary. The document is sent out beautifully engraved and with an attractive vignette of the hardy miner with pick and shovel, the mountain uplift in the back ground. This certificate for 100 shares has been sold for \$10.00 or 10 cents a share. The possessor is assured by the kindly broker that his fortune is made and that in the near future his \$10 will return him a thousand fold on his investment. The Company has been legally incorporated under the law of British Columbia. The doubt as to whether there can be any further assessment of the share is not set at rest by any judicial decision. It is said that though a Company may contract with its shareholders that its stock shall be non-assessable so far as the Company is concerned, yet if the right of a creditor intervenes in consequence of bad management, the holder of the stock may be called upon to make good the difference between the amount he has paid for the stock and its par value. This infirmity of title has not hindered a large dealing in British Columbia gold mining stocks. The public have not looked at legal disabilities which may attach to the title to the property so far as represented by the Stock Certificate. Other and more important questions which any prudent investor would desire to have investigated before putting a dollar in the property have been passed by with indifference; and brokers, miners and Company promoters have been encouraged to believe that no matter how wild a scheme may be it requires only to be brought out with a little push and energy, and the free use of certain cant phrases, to win for it the favor of the money market.

The heedlessness, the blind confidence, the readiness to take as sufficient the most lean and meagre details respecting the enterprise or the project of the Joint Stock Mining Company are largely due to an imperfect state of the law and lack of moral discrimination by legislators. The Stock Certificate in question should be a certificate of title and to some extent a certificate of value. It represents that the corporators are the owners of certain mining property. It represents that their ownership is worth one million of dollars. It is idle to say that the Government does not make contracts for individuals; that the rule "a purchaser should beware" prevails as well in the stock market as in the horse market; that neither the Act of Incorporation nor the prospectus of the Company contains any declaration of the value of the property.

Let us invoke the names of common sense and common honesty to attend our consideration of this matter, for verily brokers, company

promoters and legislators are practically mad on the subject. We have arrived at that level of public opinion that there is nothing that can be said against the dealer in lottery-ticket gambling that may not be said with ten-fold force against the seller of a mining share certificate which contains within itself no guarantee of title, no approximately true declaration of value. In fact a comparison of the lottery ticket with the share certificate immensely enhances the moral dignity of the former.

There are four classes of investors in Mining stocks:—1. The careful purchaser who knows beyond doubt the character of the promoter of the Company, the value of the Company's Property the amount paid for it, the "first floor" contract on which promoters of the Company were brought together, the nature and something of the extent of the ores belonging to the Company, the proposed mode of treatment, the financial means necessary to ensure successful operations with the ore, and the competency of the engineer and mining and financial manager of the Company. Such an investor is almost always successful in mining enterprise and generally wins large profits. 2. The less careful investor who endeavors to acquire some knowledge of the mines he invests in, who has a good deal of shrewdness and without being particularly careful is in the usual term "lucky" in selecting the subjects of his confidence. This investor loses occasionally and at other times wins large profits. 3. The investor who puts in mining shares borrowed money or means withdrawn from his family or other capital which should never be removed from its place for purposes of any speculative investment. Such an investor generally comes to grief. He finds that the Stock Certificate he has purchased was no guarantee of title; that the money raised by the sale of stock has been applied to the private profit of the promoters; that the property so far from representing the value of the company's assets at the time of incorporation never was worth one per cent of the nominal capital. Having been guilty of moral obliquity in making his investment he comforts himself by throwing mud upon the law that justifies the scoundrels who deceived him, and thus finds excuses for his own easy virtue.

The facility with which mining promoters in a period of successful speculation can obtain money for all kinds of mining enterprises would be an undoubted advantage if they were all alike good and their promoters equally honest; but it is too well known that every period of active speculation in these stocks calls into existence a considerable number of brainless enterprises, and a great number of dishonest enterprises, and that the result is to discredit very largely good investments, and to bring about a reaction from which wholesome business suffers; also to give rise to a great many unpunished and unpunishable swindles and frauds. It is very absurd to say that the law cannot check this; that any interference with the gambling methods of promoters and share brokers will be an interference with trade. No company should be allowed to incorporate without

compliance with the following simple conditions:—1. That the title to the property of the Mining Company in question has been investigated and found to be perfect. 2. That the property has been investigated by a competent engineer who reports that it is of specified dimensions; that the proposed capital to be raised is not excessive in view of the value of the property, and of the expense required to develop it. The Company's prospectus which should accompany the petition for incorporation should state what are the company's plan of operations, the amount payable to the promoters, and otherwise should give as full information to shareholders as that in possession of the directors themselves. It might also be a condition of the grant of letters of incorporation that the Secretary-Treasurer should furnish security to the Government for duly accounting for the moneys received by him. Various excellent systems of formal book-keeping for mining companies are procurable, any one of which might be chosen for observance by incorporated companies. A system of audit should be framed for regular examination of the accounts of the company before each annual meeting.

The right to go into the market for money, to obtain it for the purpose of opening mines, to withdraw from other channels of business necessary capital for mining operations is a valuable franchise without which the company promoter and broker would in vain ply their respective callings. It is little in the interest of the public to require that these several professionals shall not be suffered to unite for the exploitation of the savings of the community without certain guarantees which we have indicated. The system of protection outlined will raise the character of mining investments, will render it more easy for honest enterprise to obtain necessary capital, and will secure investors against fraud.

While not disposed to recommend the invasion of provincial rights there is much to be said in favor of bringing the enfranchisement of joint stock companies under the sole jurisdiction of the Dominion Government. Uniformity of conditions respecting the incorporation of companies, the issue of shares, the title to property held by such companies, the accounts to be kept by them, and the nature of the security to be given by the officials of the company, the sanctions required respecting the truth of representations made to the public—all these were better dealt with by the Federal power than left to the varying legislation of different provinces.

It is open to Canada to take a stand before the world in this matter, to give security to mining stocks under an easily workable scheme of incorporation and supervision of companies' accounts, and in this way to encourage the investment of foreign capital. Why not cut loose from the present absurd and immoral systems of incorporation of mining companies followed in the different provinces? Why give charters under which may be issued prospectuses that are lies and certificates of stocks that are not documents of any other title than one of nominal shareholdership?

Foreign corporations should not be allowed in this country to evade the requirements imposed by our own Government for the protection of the public.

As the law now stands behind any share certificate, and by means of it, may be perpetrated the most disgraceful swindling that tricksters and rogues can devise.

An Iron-Making Colony and its Work for Forest Preservation.

In a recent lecture on the "Forests of Canada" Professor Macoun, who is eminently acquainted with the subject, referring to the vast and untold wealth of forests that Canada at one time possessed, said, "these forests were Canada's chief assets, and instead of guarding them with care and zeal our present governments appeared to be following a policy of utter annihilation. The means by which these

vast forests were being destroyed was in some cases legitimate but in many others the legislatures had been grossly negligent of their duties in the preservation of this one great fortune which has been consigned to them for sure and safe keeping. The heritage of young Canadians was being squandered and when the rising generation reached years of maturity instead of taking possession of their once valuable heritage they would fall heir to a barren plain."

The Professor's indictment of private greed and public neglect is not sufficiently plain and specific. The forest domain has been surrendered to a policy of spoliation. There is no limit to the operation of this policy but the demand of the spoilers. Even the high price obtained for limits in late years does not cause the public to press strongly any claim in the interests of prosperity. When this is feebly uttered it is met with the answer that the money from the sale of timber lands is legitimately used for the benefit of prosperity in the erection of asylums for blind, for mutes, lunatics and idiots.

It is not for the purpose of enlightening public sentiment on the folly of this plea for forest spoliation, that the REVIEW thus introduce to its readers the project of a Government iron-making plant in the Northern Wilds of Canada. It is to point out the value of such a project as an object-lesson for teaching the people the value of charcoal fuel.

Some favorable remark of the *Globe* on a scheme for planting an iron-smelting colony in the Nipissing District has called for the obvious criticism that the great daily has forsaken for the nonce its free-trade creed, and protectionist papers have not been slow to jubilate over the matter. The *Globe* knows very well, everyone knows, that the history of iron smelting belies such *doctrinaire* theories, as that free-trade stimulates invention. The greatest of metallurgical discoveries, the Bessemer process, made the fortune of its inventor by his patent-right, and the control of the processes within the United States, through the operation of the tariff, made several greater fortunes.

Great Britain nursed the iron-making industry with the aid of a prohibitory tariff, and when the trade grew strong set it free to extend commerce. The United States has built up a greater iron and steel trade than that of Britain by following her parent's example up to that point, and her trade has been nursed until the infant has become a giant, and is now able to sell iron at a profit in the British market. The Belgian trade a very vigorous rival of Britain, was nursed by the aid of the purse of an enterprising King who founded the Seraing Iron Works. Sweden, which has a very active and important iron and steel industry, makes its prosperity a chief care of the Government. Charcoal making schools were introduced by the Government to teach the art of careful meiler-building and burning in the Swedish Forests,—in some such manner as the Ontario Government has sent instructors among farmers to teach the arts of butter and cheese making.

Charcoal iron manufacture vindicates its claim to regard as the most profitable of all iron making processes, not that it gives the manufacturer the largest profit, but that it shares with the laborer more money than any other iron making industry, and in this way is the most effective of all industries for distributing among laborers the market price of the product. The lumberman gives to his laborers about one half of the selling price of his products, and divides the remainder between his own pocket and his banker. The charcoal iron maker pays for every ton of iron, the following labor wage:

For charcoal fuel, labor.....	\$ 6.00
" royalty on wood.....	50
" Iron ore—labor.....	2.50
" royalty on ore.....	50
" labor at furnace.....	3.00
" interest, wear and tear.....	1.50

\$13.50

The capitalist who owns the wood, the ore and the furnace, receives \$1.75, the laborers \$12.00, and the plant shrinks 75 cents in value, in the manufacture of every ton of charcoal iron. When the capitalist is the Government these figures will give place to other estimates of royalty in the value of such a product to the general industry of the people, the value of the colonists themselves, and other important factors. This is not a favorite industry with the capitalist. There is too much hustle in it; too much depends upon the willing co-operation of all concerned. If the fuel makers are not co-operators the furnace-man cannot look elsewhere for supplies. The industry is eminently suitable for calling out a spirit of co-operation among those engaged in it; and the prosperity which attends its operations is well calculated to foster that spirit of self-help and energy so necessary in colonization enterprises. First and foremost, the woodsmen, charcoal burners, teamsters, miners, furnace hands, are employed all the year round. Their necessary food and clothing calls for other work. The more advanced the industry, the more workmen, the more skill, the greater the value of the returns. There is a place for the manufacture of Russian sheet-iron alongside of any charcoal pig-iron furnace. The furnace product is thus quadrupled in value, the number of laborers maintained largely increased, the market of neighboring farmers calls for larger supplies.

While the Nipissing district has undoubted advantages of site to offer, it is worth considering whether such an enterprise should not be located in the new territory approached from Lake Temiscamingue. Here it would be at the gate, so to speak, of that immense territory beyond the Height of Land, which our children must go up and possess. It could give the pioneers their stoves, stove-pipes and ploughs, and around it would nestle the grist-mill, carding and fulling mill, the tannery, the wagon-maker's, blacksmith's and shoe-maker's shops, and all the activities of the pioneer town with its schools and churches, and most important of any from the material stand point, the market for the settler's products. It goes without saying that a strong effort should be made to encourage Scandinavian immigration into that country. In no way could it be more effectively introduced than by establishing there an industry well known to the Swede. It might be made at the same time a school for our young people, for French Canadian pioneers who would be sure to follow it, for immigrants from Germany, Switzerland and elsewhere. Carefully planned and managed within estimate, the project may be made to return to the country its entire outlay.

The value of every acre of fairly wooded land expressed in tons of charcoal fuel, will range from \$70 to \$100, according to the variety of wood from hard to soft. No industry the Provinces can establish compares with this for educating the settler in the knowledge of the value of the timber on his farm. He may chop at any season and in all weathers, burn his kilns or meilers when the weather is favorable, find occupation for his horses at the intervals between farm labor, eke out the earnings of his family perhaps by sending some one of them to the furnace or mine. There are other industries which may be attached to such a project, such as the manufacture of methylated spirit as a by-product from the charcoal kiln. We share, however, the views of those metallurgists who believe that charcoal from this process is not uniformly so good as that made where the gases are not withdrawn for distillation. On the other hand something may be said in favor of carrying further the process of educating the settler in a sense of the value of his forest property by making the most of it before his eyes. It may serve to impress upon him before it is too late the enormous value of the forest in that new country awaiting his occupation. Without some such effort as this, some such result as this, it will be the part of wisdom to prevent any effort to colonize a country which, deprived of its forest clothing, will become one of the most bleak and inhospitable of climes.

Gold Mining in Nova Scotia.

During the season of 1896 gold mining in Nova Scotia has pursued its uneventful career. From the official returns hitherto published it would appear that the output will be somewhat in excess of that of the previous year. During the many years that the precious metal has been sought in this province an annual output has been maintained so regular, although small, that the question of its limited amount is interesting. For years the number of mines has remained about the same, some work a few months, others yield regularly for years. Old districts supposed to have been thoroughly ransacked suddenly show workable veins.

During the past season Brookfield and Stormont show up best, each having about 5,000 ounces. The energy of Mr. Libbey in the former district in opening a mine abandoned by a wealthy company has well repaid him, and he is erecting chlorination works to treat the tailings of his predecessors, and presumably some raw quartz. At Stormont the rate per ton is much lower than at Brookfield, but it is an open question if in the long run the lower grade ores will not prove the most satisfactory. Oldham, a well-known producer under Mr. Hardman, is now idle. At Mount Uniacke the Golden Lode mine continues regular returns and dividends. Cariboo and Fifteen Mile Stream about maintain their position. The returns from other districts remain inconsiderable.

In few countries do the prospects of gold mining appear more alluring than in Nova Scotia, for seldom can native gold be seen in greater attractiveness than in the gold quartz of this province. These veins, when worked by individuals or small syndicates, yield good returns, but so long as the system prevails of utilizing all profits for dividends grief comes when the first pay-streak is ended. Even when experience has shown the succession of pay-streaks in a vein local capital hesitates to attack a property unless it shows richly on the surface.

The immense number of veins, the frequency with which they show gold, and the large extent of the gold bearing district, all unite to induce the Nova Scotia gold miner to spread himself over a number of prospects, to spend little on each, and to hope that some one of his chances will prove a bonanza. If the extent of auriferous ground were one-tenth of what it is there would be more legitimate prospecting and mining and much greater returns.

When rich veins are found a few feet or inches away from veins that have been abandoned one is inclined to smile at the thought how blind is sometimes the race for gold, and how much more is left to chance than to search.

Hitherto attention has been confined to the small rich lodes. No miner in judging of the value of a Nova Scotia vein considers it worth attention unless it plainly shows free gold. The adaptability of the cunning devices of the metallurgical chemist for the extraction of gold from ores, carrying it in shapes practicably invisible, is almost undreamt of here, and the occurrence of considerable amounts of gold in ores apparently barren is more common in Nova Scotia than is generally believed.

The surface covering many of the gold districts, and the water courses and lakes crossing them, are in many cases worth attention. It is true that the Province does not present vast tracts of auriferous alluvium, but the points indicated carry not only innumerable pieces of gold bearing quartz and slate torn from the vein crops, but also grains of gold, so that the most trivial examination shows accessible values in excess of those locked in the veins.

One veteran miner working on a small scale easily finds remunerative returns from this source, and it appears strange that his example has not been followed, but possibly in many cases the individual is in a hurry to strike it rich.

The official returns show that year by year the contribution of gold from low grade ores is increasing. This is specially noticeable in the Stormont district, where, during the past two seasons, the yield has averaged between four and five pennyweights, and similar results are shown in the Sherbrooke and Cariboo districts. It is understood that these low grade operations, although conducted on a small scale, show satisfactory returns. If the attention paid to this grade of ore continues, it will shortly form the mainstay of Nova Scotia gold mining.

It is true it is not as attractive a business as the so-called "legitimate" gold mining, where men run round with samples of rich ore, but it contains the principles of sound commercial mining business. If local capitalists and prospectors instead of seeking for outcrops of small, if promising, veins to be sold as prospects, were to seek and properly test low grade propositions, abundant capital could be found for development. If a block of ground tested and proved by millruns and shafts to contain thousands of tons of ore which could be cheaply worked and milled on a large scale to yield a fair return were presented on the market, capital could be enlisted as easily as for a sub-arctic mine on the Pacific.

It is the opinion of many who have shared in and watched the course of gold mining in Nova Scotia that, with the economics of the present day in mining, milling, concentrating, etc., the time has arrived when the gold industry of the Province is capable of unlimited and permanent expansion through the careful and economical handling of its low grade ores.

Gold Mining in Cariboo, B. C.

In accordance with your late instructions to visit and report on the gold bearing gravel mines of Cariboo District, B.C., I have commenced the work laid out for me and give you below an account of my travels, and of the mines in operation and those in process of equipment in the districts I have thus far visited.

At Ashcroft, a station on the Canadian Pacific Railway and the shipping point for Cariboo, Lillooet and the districts farther north, I found every man I spoke to on the subject an enthusiast on mining. British Columbia, generally and Cariboo District in particular, is destined to soon become the greatest gold producer in the world. After seeing the 400 lb. ingot of gold, valued at \$81,622.00, the result, I learned, of about eighty days' washing at the Cariboo hydraulic mine at Quesnelle Forks, and hearing of the many Canadian, French, British and American companies, with capitals of \$1,000,000 to \$5,000,000, who have purchased and began work on immense and reputed rich auriferous gravel deposits in Cariboo this season, I thought there might be good grounds for the great enthusiasm of the people.

Following the advice of a friend as to the route by which I could see the most in the shortest time, I proceeded to the 108 Mile House on the Cariboo Road, thence 60 miles over a comparatively good road to Horse Fly.

There I found the Horse Fly Hydraulic Mining Company's gravel mine in full operation, with Wm Bissett, assistant manager, in charge. This valuable property is owned principally by Sir Wm. Van Horne and other officers of the Canadian Pacific Railway, Senator MacInnes and other capitalists of Montreal and Ottawa. The same syndicate also own the Cariboo hydraulic mines, situate on the South Fork of Quesnelle River, about twenty-six miles by trail from Horse Fly. Mr. J. B. Hobson, an experienced mining engineer from California, is manager of both these great properties.

At the Horse Fly mine I found one of the most perfect water systems and best constructed canals, dams and waste weirs that I ever saw in any mining district. Two thousand to two thousand five hundred miners inches of water is used in the mine, forced through four

large giants under a pressure, or head (as miners term it), of about 110 feet, and used to cut down the banks of gravel, carrying it over the sluices, where the gold is caught in the riffles and the sand and gravel, or tailings, is dumped into the Horse Fly river. The water is brought from Mussel Creek through about twelve miles of canal and two and a-quarter miles of 30 in. steel pipe. The pipe line is laid on the plan of an inverted siphon and carries the large body of water over three deep depressions.

When the water is not required at the mine it is delivered into a pooling reservoir, which the company has made out of Rat Lake, by building a dam at its outlet 360 feet long and 10 or 12 feet high. The ditch or canal carries from 1,800 to 2,000 miner's inches of water to one sand tank and another short ditch from Rat Lake reservoir to a second sand box carries enough water from the reservoir to make up any quantity required at the mine, up to 3,000 inches, or more, if necessary.

When Dan McCallum, the original owner of the property, sold it to Mr. Hobson for the syndicate, he had washed out two small pits, showing faces of gravel about 150 feet across and a bank of 70 or 80 feet high, all good looking, well washed free gravel, from the bed-rock to grass roots. An occasional chunk of cemented gravel was met here and there in the bank.

McCallum used an inch pipe and a small monitor with a 2 to 4 in nozzle, and of course his progress was slow.

The present company's two strings of 22 inch pipe, delivering 2,500 inches of water through two and sometimes four giants with 6 to 8 inch nozzles have washed away several acres of the gravel. The past season they had more hard cemented gravel to contend with, which increased in quantity as the bank was worked back, until now the hard cemented gravel has closed down to the bed rock in many places across the whole present face of the workings about 600 feet.

I examined and panned out the bottom gravel in many places across this face and in no pan of gravel that I saw washed did I fail to find gold, sometimes 10 or 20 coarse colors and often as high as 25 cents to 50 cents to pan was found. In many places even two and three feet above bed rock I could see the gold sticking in the cement. Much of the gold in this cemented gravel must have gone over the dump into the river, imbedded in the lumps of cement, which it was impossible to break up fine enough to liberate the gold. In fact I picked up several lumps of cemented gravel on the dump, containing gold. I believe that softer and free washing gravel will be found ahead when the other rim of this most extensive ancient river-channel is found.

I believe that it will be impossible and unprofitable to continue to work this company's bank of rich gravel by the hydraulic system on account of the cemented character of the deposit as now exposed in the present workings.

From what I saw I am confident the mine could be made to pay good dividends, if the rich bottom strata of cemented gravel was drifted out and crushed in a quartz or stamp mill.

Mr. Bissett informed me that the proposition to erect a large milling plant on the property next season, had been recommended by Manager Hobson and was now being considered by the shareholders.

I predict a great future for this mine and large dividends to the shareholders if a large milling plant is installed. The extent of the deposit and its apparent uniform richness warrants in my opinion the erection of a 20 to 40 stamp mill. A 10 stamp mill would crush from 15 to 20 tons of this gravel per day, but there are thousands of tons of rich gravel in sight and exposed by one or two prospect drifts to warrant the immediate erection of a much larger milling plant.

I had the pleasure of meeting Senator R. H. Campbell, a mining engineer of 40 years experience in working the ancient river channels of northern California and the inventor of "Campbell's Hydraulic Gravel

Elevator," who is here in the interests of a wealthy syndicate of San Francisco's business men and mine owners.

He informed me that he came to Cariboo in 1895 to examine and report on the old Harper mining ground on Horse Fly river, located about four miles up stream from the Horse Fly Hydraulic Mines. His report was favorable and led to the purchase of the Harper property and the incorporation of the Horse Fly Gold Mining Company.

He made a careful examination of the Horse Fly Hydraulic Mine at that time and so impressed was he with the richness of the gravel deposits in both the Horse Fly and the Harper grounds, the great width of the channels exposed and the immensity of the auriferous gravel deposits of the ancient river systems of this district that he returned again this season and has located over four miles of mining ground on the continuation of the Horse Fly Hydraulic Company's and the Harper's channel. He has a strong company behind him and has gone systematically to work sinking prospect shafts to prove the correctness of his conclusions. From what I have seen of his locations and the prospects he has already found, there is little doubt of the correctness of his judgment; and that his practical experience has secured for his company a very valuable mining property, which will need only a year or two's time and the judicious expenditure of enough money to open and equip it, to put it among the large gold producers of the Cariboo district.

I have other mines and prospects to examine in this locality before I pay the Cariboo Hydraulic Mines and Quesnelle Forks a visit, but as my time and your space are both limited I will close this letter and in my next give you a true account of the condition of the Cariboo Hydraulic Mines and any others that I may visit.

H. B.

Prospectors' Classes and Mineral Collections in Mining Centres.

By Wm. Hamilton Merritt, F.G.S., Associate Royal School of Mines.*

Ontario being as yet the only Province or State on this Continent which has adopted the New Zealand plan of Prospectors' Classes in mining centres, and has been the first to adopt the policy of placing mineral collections of a mixed economic and scientific character in localities where mining or prospecting is carried on, I have deemed that a few facts in relation to these classes might be acceptable to the Institute.

The origin of the classes, of the Bureau of Mines, and of many reforms and alterations to our mining laws, may be traced to the Royal Commission which was appointed in 1889 by the Government of Ontario to enquire into the Mineral Resources of the Province.

As a member of that Commission it was my duty and pleasure to bring to the attention of my colleagues certain facts which came to my attention, regarding classes held in Mining Centres in New Zealand for the encouragement of prospecting.

As it was evident that Ontario was yet essentially in the prospecting stage, and that its vast extent of territory and diversity of mineral occurrence should prove a prolific field for prospectors, the Commission took evidence as to the desires of those interested at the different points where Sessions were held. The Secretary of the Commission, Mr. A. Blue, also collected extracts from the New Zealand parliamentary documents and in their final report the Commission strongly recommended prospectors' classes in mining centres somewhat on the New Zealand plan.

No action was taken in the matter until in 1894 the governors of the Kingston School of Mining instructed me to hold a Prospectors' Class at Marmora for two weeks, the charge for attending which was four dollars. The course of work which I adopted varied somewhat

from that adopted in New Zealand, so far as can be judged from the official reports of that country.

In New Zealand the plan of their course resembles rather that of the four weeks Prospectors' Course held at the Kingston School of Mining in the winter—viz a short School of Mining.

Our two years prospectors' course is designed to be essentially a field course, entirely devoted to what a prospector sees, handles or manipulates in his prospecting or testing.

One of the chief objects of the course is to encourage and assist the prospector in the testing of any ores he may be interested in, and so thoroughly appreciated is this branch of practical instruction that as a rule some members of the class are at this work all day during the time which the class lasts.

Lectures, illustrated by diagrams and specimens, blow-pipe work, framing work and assaying of gold and silver constitute the general outline of the course. Most of the testing work has been done on gold ores, and to meet the needs of the prospector in the field I have got together a cheap and portable outfit by which he can determine the value of the ores of the precious metals in the field as low as \$1.50 a ton free milling in gold, and less in silver, and as high as the ore likes to run.

As this outfit is now made by Sargent & Co., of Chicago and Lyman Sons., of Montreal, in a form to go in a pack-sack, the prospector can have no difficulty in finding out in his tent how many dollars a ton his ore runs, instead of the vague generality that "it pans."

A couple of results made by prospectors in this manner might not be without interest.

PAN AMALGAMATION.						
Free Gold per ton Ore.	CONCENTRATES.			Total value per ton Ore.	ASSAY.	
	No. tons Ore to be Concentrated.	Value ton of Concentrate	Value of Concentrate per ton Ore.			
1 \$18 00	128	\$69	59	\$11 10	\$11 33	
2 \$163 00	42	\$38	70	\$146 30	\$180 00	

That the classes have been appreciated would seem evident from the fact that the numbers attending them have been steadily increasing as the practical character of the instruction has become known to the prospectors. For an example, during the present summer 135 attended my three classes at Rat Portage, Mine Centre (on the Seine) and Fort Francis, notwithstanding the fact that they were held during the "busy season." It is needless to say that the benefit supposed to be derived by the prospector from this class of instruction is largely indirect, for it will more than nine times out of ten be the means of proving to them that a prospect is "no good," and therefore better left alone, saving him fruitless expense and loss of time, than by revealing to him that he has made a very rich find, which in most cases speaks very emphatically for itself.

It should be added that since the first experimental class at Marmora the Government of the Province have provided the means for carrying on these classes, and their direction is at present placed in the hands of the governors of the Kingston School of Mining as the originators of them in Ontario.

The Royal Commission, above alluded to, deputed to me the collection of minerals at the places we visited, and the compilation of facts regarding museums of natural resources, particularly minerals of economic values. In the report of the commissioners a provincial

*Paper read before Ontario Mining Institute

museum is strongly recommended, and it may be noted with satisfaction that the Director of Mines, with the commission collection as a nucleus, is rapidly getting together a collection of ores and rocks in the Parliament Buildings which some day will go far towards making up a provincial museum.

In connection with the prospectors' classes in mining centres, I found that there was a great desire on the part of those attending to have a local collection of common typical rocks and ores to which they could refer as examples, and to which they could add local specimens.

In this way they hoped not only to have a collection by which they could continue their studies, and refer to for types they found, and of which they were not quite certain, but they expected material benefit to the locality from a stable local exhibit of good samples of their mineral possibilities.

Private collections are so frequently broken up and parted with that it was agreed that donations of minerals placed in the hands of trustees would be of immensely greater value to the district in the long run.

When the attention of the Government was called to these facts they very generously acceded to the request, and have arranged with the Kingston School of Mining for typical collections of ores and rocks to be placed at Rat Portage, Port Arthur, Sudbury, Sault St. Marie and Marmora.

The work of getting together the specimens and arranging for cases is now going on.

The Valuation of Prospects.

BY HOWARD WEST, A. R. S. M., MEW DENVER, B. C.

One of the foremost questions, which we as mining engineers have to consider at the present time in British Columbia, is the strained relationship which sometimes exists between capital and labour, or in other words prospectors.

It is our aim and duty to the country, as well as to our own interests, to effect as many legitimate sales of mining property as we possibly can. A great responsibility devolves upon us, when in the course of our professional work, we are consulted by possible investors; a responsibility with far reaching effects, the ultimate limits of which we cannot possibly foresee, and it behooves us therefore to use every means at our command to see that fairness and justice are done to investors and prospector alike.

Our first consideration, must be to aid in the development of the marvellous mineral resources placed at our disposal by the bountiful hand of nature.

We must not forget that to the prospector we are indebted primarily for the discovery of all our mineral wealth and that without his aid, the province could not possibly have advanced to the honorable position which it now occupies.

In his search for the unseen vein, he braves all weathers and fights his way often against tremendous odds, to stake claims, it may be in regions remote from man's existence. No obstacles however insurmountable to others can check his dauntless spirit; the smooth and placid lake, the rushing torrents of the mighty mountain stream, the civilized community, or the wild untrodden mountain paths, are all alike to him; he cheerfully spends his last cent perhaps in attempting to open up tracts of country previously unexplored and too frequently his reward is so meagre, that it would not equal the wages of a working man in more populous parts of the world.

But the prospector alone is insufficient for the opening up of any country in a primitive state, his purpose is merely to reveal the hidden treasure, and after his work is done, we turn our eyes towards the mighty form of capital, for the proper and effectual development of our latent resources.

How are we to attract capital into our midst and retain at the same time the good wishes of those hardy pioneers, the prospectors.

That is a question of the utmost importance to us, and one which merits our most earnest consideration, it is clear that the only feasible way is by doing justice to both, and in a great many cases as I remarked before, it depends entirely upon us, with the honor of the province at stake, to see that bogus transactions and wild-cat propositions are avoided.

There are many things to be guarded against from both stand-points; the discoverers themselves are often to blame for the dead-lock which occurs. If a prospector is fortunate enough to find a ledge, which from its outward appearance one would judge likely to prove productive of mineral wealth, as often as not he immediately begins to build castles in the air, or perhaps I should say underground; in imagination he sees a second Comstock or Broken Hill mine and eventually becomes so elated with his success that a prohibitive price is placed on the property and all reasonable offers refused. The harm done to the country in this manner is incalculable; I speak from experience, gentlemen, when I say that at least a dozen such cases occurred to my own certain knowledge in the Slocan Lake district alone, last year; thus holding the country in an undeveloped state when by this time it might have been effectually proven.

It is a practice also with many prospectors to keep on hand a number of very doubtful claims; these are artfully contrived to show to the best advantage with as little real development work as possible; the chances of their turning out well, are very slim indeed, but there are always to be found numbers of purely speculative investors willing to risk their means on properties whose ultimate paying qualities are to say the least extremely problematical. That is the reason professional wild-catters cannot be eliminated from our midst.

I don't wish to be misunderstood on this point, systematic development is a very desirable and necessary thing, but we must remember that it is not the hole in the ground which is of value, but the ore which is thereby disclosed to view, and what I wish to object to, for the benefit of investors and the country generally, are the blind mining deals which sometimes take place without the intervention or consultation of some reliable mining man.

The difficulties with which the successful capitalist has to contend are in my estimation even greater relatively than those of the prospectors. True he has not the severe physical strain to undergo, which is part and parcel of the average prospector's life, but he shows his good faith, by risking considerable sums of money; whereas the prospector in most cases has all to gain and little or nothing to lose. He is in fact, virtually trying to make a fortune out of nothing, whilst the capitalist may not unfrequently lose all that he invests.

Mining properties can and should be made to change hands on a strictly business basis.

If careful capitalists will always consult a mining engineer of standing before investing and not rely too much upon his own judgment in such matters; and it is to him that he looks to see that he pays no more than a fair price for any property which he may wish to acquire, that is to say one strictly proportional to the calculated risk which he is assuming.

How then are we to decide within reasonable limits, what a prospect or mine in an undeveloped state is worth? To begin with, it is of course necessary that a mining engineer the same as anyone else, should have something wherewith to guide him in estimating the value of any claim, a fact which many people seem to overlook entirely. They appear to imagine that the mining experts as they are very suggestively called, possess some supernatural instinct by means of which they are enabled to see hundreds of feet into the solid rock and locate valuable ledges without difficulty. It seems almost a pity for the reputation of our profession and the benefit of these people, now that such wonderful

results are accruing in surgery from the use of the X rays that their application cannot be extended, so that we really could see into the earth's crust. Mining would then be comparatively easy and possibly the scope of mining engineers much more limited.

However, I don't think we need discuss such remote contingencies at this meeting, it will be time enough when the new photography is farther advanced than it is at present.

We find also in our professional work, that we have to deal with another and totally different class of people from the last, these persist in going to the opposite extreme, that is to say they lay emphatic emphasis upon the fact of their belief, that it is impossible for one man to see any farther into a ledge than another.

Such an argument needs no refutation and we are perfectly willing to accept it so far as actual vision is concerned, but the real value of a good mining man, depends not on the ability of his optical organs to pierce solid rock, but on the deductions which he is able to make from visible and available data.

Valuing a prospect correctly is necessarily a far more difficult matter relatively than valuing a well developed mine, as in the latter case the actual ore reserves and calculated profits have practically only to be taken into account and the question of possibilities is a minor one. In a prospect on the other hand a far different state of things exists, the possibilities and probabilities are all important and can be made the only true basis of calculation.

When a claim is in an absolutely undeveloped state, external characteristics are of course all with which we have to deal, we must note carefully the formation on the claim we are examining and that on adjacent property and so determine, whether the vein is likely to prove continuous or not. Particular attention should also be paid to the general character of the ore deposit. The evidence of open cuts, creek beds, out-cropping rocks, displaced boulders or uprooted trees must not be ignored, the smallest indications may sometimes lead to the most wonderful discoveries.

It is very important to examine the dip and strike of the vein and see whether they conform in any way to those observed on contiguous or neighboring claims where greater development has taken place. We must not forget to profit by the experience of others, but at the same time we must be careful to depend upon rule of thumb methods, only so far as they are strictly applicable to the case under consideration, because in no other profession perhaps are narrow views so detrimental, or originality of thought and purpose so essential.

Because in one particular instance we may find a valuable ledge trending in a certain direction, it does not necessarily follow, nor are we justified in assuming, that one running in some other direction is valueless, although in a great many cases, such has proved to be the case. It is generally conceded by mining men that if two ledges trend at right angles to one another, it is unlikely that both will be found productive, yet in exceptional cases, notably in the Isle of Man, two very valuable mines may be so located.

Sound common sense is in fact, the first requisite towards becoming a successful mining engineer, and we might appropriately add broadness of principal as well.

Thorough investigation must always be made and reasonable development done, before coming to a final conclusion regarding any property.

The character of the ore is of course, another important factor to be observed; by this I do not mean its mere assay value, but its adaptability to ordinary concentrating, milling or smelting processes. In noting this on the surface, we must allow for a possible change in character as we go down. Many ores, including those of gold and silver, may become refractory below the water line and the possibility of this occurring must not be overlooked in making our estimation.

When a prospect gives indications of eventually becoming a large producer, the situation of the claim is of vast importance. Proximity

to good timber and water supplies is very necessary, and where possible it might be advantageous to have a reserve of water-power, available for working machinery if required.

On the situation or conformity of the ground, largely depends the cost of working, tunnelling is as a rule the cheapest method of tapping the vein at great depths below the surface; it affords at the same time direct and inexpensive drainage and allows of the ore being taken from the mine without the necessity for instituting elaborate hoisting machinery. The difficulty of finding suitable dumping ground, is too in this case entirely obviated. Therefore, other things being equal, a claim on the side of a hill, provided it is not too steep, has an advantage over one on more level ground. An additional advantage accrues where milling or concentrating machinery may become necessary at the mine.

A disadvantage in some cases perhaps, is present in the shape of danger from snow and mud slides, but this is purely a local matter, and with proper precautions and some additional expenditure, may usually be effectually guarded against.

The cost of working and the necessity for timbering, are rather hard matters of which to judge from the outside, but a rough estimate at the time, might afterwards be found useful.

Accessibility of the claim to ordinary transportation facilities is another important requirement. We have a splendid example close at hand of one way in which these difficulties have been overcome by means of a wire ropeway, in other cases gravitation tramways have been successfully employed, but either of these require more capital than many can command, and the ordinary claim or mine owner has to rest content with good trails or waggon roads, over which it is possible to pack, haul or raw-hide the ore at a moderate cost.

In one instance in the Springer Creek district, \$40 a ton was required to pack the ore from the mine to Slocan Lake, a distance of seven miles, in addition to another \$25 dollars per ton for freight and treatment from that point, so that this is obviously a very important consideration. The net cost of supplies is also dependent to a large extent upon the same conditions. In the instance above cited, \$30 a ton was charged for merely shipping the supplies to the mine.

There are just two other matters of prime importance which I should like to mention in passing. Before purchasing or advising anyone to invest in any claim, we must satisfy ourselves thoroughly, that the property really belongs to the person expressing his willingness to sell, in some instances we find that claims have been bought and paid for, to which the party selling had no legal right and consequently the buyer no legal claim.

Litigation is a regular bugbear to contend with, and may easily be avoided by thorough and systematic investigation beforehand.

In estimating the value of a claim, the probable capital necessary for the working of the same, should be earnestly considered, as otherwise the investor may eventually find himself in the unenviable position of a man who started to build a house without having first counted the cost, and for want of funds left it only half completed, as a lasting monument of his folly.

Many other points of extreme interest to us, which come strictly within the limits of this paper might be referred to before concluding, but I do not wish to monopolize more of the valuable time of the association, and they will all no doubt be brought forward in the discussion which follows and I trust that as we're never too old or experienced to learn something, it may prove both interesting and helpful to us all.

The next meeting of the Mining Society of Nova Scotia will be held in Halifax some time in December.

The Asbestos Club meets in the club room, Black Lake, Que., on Thursday evening, 29th instant. Mr. C. E. Morin will read a paper on "Acetylene Gas."

EN PASSANT.

At a meeting of the Council of the General Mining Association of the Province of Quebec, held at Montreal on 8th, instant, it was decided to postpone the Annual General Meeting from the second Wednesday in January to the first week in February. This will permit members presenting more accurate returns of the mineral industries than would be possible at the earlier date at which these meetings have been held heretofore.

During the same week the first united meeting of the various Provincial Mining Societies will be held under the auspices of the Canadian Mining Institute. Arrangements are in progress for a first class programme. Among those who have promised contributions to date may be mentioned: Mr. Chas. Fergie, on "Coal Washing Plant of the Drummond Colliery;" Mr. Wm. Blakemore on "Louisburg—Its Importance as a Coaling Station for Imperial Purposes;" Mr. E. A. Sjostedt on "The Utilization of the Mill Refuse and Peat Mosses of the Ottawa;" Mr. John Hardman, "Notes on the Trail Creek District, B. C.;" Mr. John J. Drummond, "Notes on a Visit to Sweden—having reference to the Manufacture of Charcoal iron in that Country;" Mr. John B. Hobson, "Notes on Hydraulic Mining in the West;" Dr. A. P. Coleman, "The Gold Fields of Ontario;" Dr. W. L. Goodwin, "Some Metalliferous Rocks of the Kingston District, Ontario;" Mr. J. F. Lewis, "on the Uses of Compressed Air, etc." Others who have promised to contribute are Mr. J. H. Chewett, Mr. A. Blue, Director of Mines, Mr. C. H. Mitchell, of Toronto, and Howard West, A.R.S.M., New Denver, B.C. It is also proposed to utilize one evening to an illustrated lecture on "The Progress of Canadian Mining" Mr. L. O. Armstrong, Colonization Agent of the C. P. R. having kindly consented to exhibit a large number of views of our mining operations above and below ground by calcium light. It is more than possible that visiting members will be entertained by the Quebec Association to a dinner in the Windsor and other functions.

We desire to acknowledge receipt of the seventh volume of the reports of the Geological Survey of Canada being for the year 1894. This bulky volume, bound in a serviceable cloth cover, contains some 1206 pages. It is accompanied by eleven maps and illustrated by fifteen plates and diagrams. The volume, as usual contains a mass of information of great value.

The Annual Report of the Ontario Bureau of Mines for the year 1895, issued this month, shows that during that period 99 patents were issued for mineral lands in that province embracing a territory of 7,720 acres, nearly two-thirds of which are to the credit of the Rainy River district which embraces the gold regions of the Lake of the Woods, Rainy Lake and Seine River.

Mr. A. Blue, the Director, in his introductory remarks concisely summarises the progress of mining in Ontario as follows:

"Although Ontario is a Province of large extent, and embraces within its boundaries geological formations from the lowest and oldest up to but unfortunately not including the coal measures, and although evidences abound of the richness and variety of its mineral wealth, it is not yet possible to speak of it as a country possessing a well established mining industry. In some directions we are making progress, and year by year confidence is growing that capital and labor will find a generous reward when employed in opening up the hidden treasures of our rocks: but in the minds of most people the rate of progress is painfully slow, and in some minds there are doubts if the treasures really exist anywhere. Meantime the hardy explorers are busily employed in search of minerals, and reports of new discoveries are heard from quarters of the Province heretofore not suspected of possessing ores or minerals of any kind, and locations are being taken up, and men with money at their credit in the

banks are making investments, and occasionally mining camps are established, and in spite of the depression in trade and the stringency in the money market there is a feeling that somehow the outlook is brightening in Ontario and that the process of education which has been carried on with more or less assiduity during the past four or five years concerning its mineral resources is producing its natural effect, even upon a people so slow to take up new and possibly hazardous enterprises as the Canadian moneyed men, with their \$187,000,000 deposited in the banks. The merchants and manufacturers of Hamilton, with the courage and dash for which they are becoming noted, have had the satisfaction at last of seeing their iron furnace blown-in and producing from native ores a pig iron of first rate quality. It is well nigh forty years since the last iron furnace in Ontario went out of blast, and during that long interval the iron mines of the country have been almost wholly idle. Indeed so little interest was felt in iron ores during this period that men had ceased to look for new deposits, and if discoveries were made it was more as a result of accident than of prospecting with intent. The requirements of the Hamilton furnace will no doubt lead explorers to take to the woods again, and old mines will be reopened, and roads and railways will be built to reach known deposits, and capital and labor will find employment in many directions in response to the requirements of this one new enterprise of the sturdy business men of Hamilton. The nickel and copper mines too are showing that they have a solid bottom. They are producing steadily, the demand for their metals is well maintained and although reverses may be met with by some who undertake to work those mines, there is no fear but they will continue to give employment to men and money, as well as character and stability to mining operations in the country. Mining begets mining, and the industry established at Sudbury cannot fail to react upon like undertakings elsewhere. The reputation of nickel as a metal valuable in the arts is growing every year, new uses are found for it, and with the cheapening of production as a result of the discovery of new processes for treating and refining the ore, it cannot be but more labor, more capital and more skill will be required in its production. And of this fact we have a pretty good assurance, viz, that the largest and richest deposits of nickel in the world are found to lie within an area of 2,000 square miles in the Province of Ontario, and in a region of easy access by water and rail. There may be richer and larger deposits elsewhere, possibly, but if so they remain to be discovered. Then there are the gold fields. The precious metal is found in the eastern part of the Province, in the county of Hastings, where mines were worked a quarter of a century or more ago, and where they are likely to be worked again and to greater advantage, with a knowledge of better methods for treating the ores and winning the metal. It is found in the middle northern part of the Province, in the same great Huronian belt which produces the ores of nickel and copper, where discoveries have been made of very bright promise, as around the shores of lake Wahnapiac. It is found on the north shore of lake Superior—where is a discovery not yet a year old, and the large veins of rich quartz there are likely to yield bullion in good quantity before the present year is out. It is found too throughout an extensive region from Lac des Mille Lacs to the western shore of Lake of the Woods and from Rainy lake on the Minnesota boundary to Lonely lake on the Keewatin boundary, a tract of at least 2,000 and more probably 3,000 square miles. Here, on Lake of the Woods and along the Manitou and Wabigoon rivers, on Rainy lake and along the Seine river, most promising discoveries have been made within the last four or five years, and perhaps the best of them within the last four or five months, and already several mines are steadily worked and are producing gold with an outlay of capital which in other countries would strike the miner with astonishment. Many of the properties are easily reached by waterways; indeed the prospector has hardly yet at all ventured inland from the canoe routes, and in consequence there is little need of roads over which to take machinery or supplies. And of course there is no scarcity of that very essential element in milling gold ores, water. In Western Australia at the present time the Legislative Assembly is being asked by the Government to grant \$12,500,000 to provide a water supply of 5,000,000 gallons daily to the Coolgardie gold fields. The whole area of this gold field of ours in north-western Ontario is a network of rivers and streams, with navigable lakes whose long arms stretch inland such distances as to give to comparatively small sheets of water like Lake of the Woods and Rainy lake a coast line as long as that of Lake Erie or Lake Ontario. The timber too is abundant

for every purpose of the miner, underground and above ground, for supports, for buildings and for fuel. And there are many gold fields elsewhere to which gold hunters flock where no timber is to be had for any purpose. In Western Australia wood for fuel costs \$10 per cord. Moreover, the ore of this wide region is almost altogether free milling; so much so that with a stamp mill 80 to 90 per cent. of the contained gold may be taken off the plates. It is usual to speak of placer deposits as a poor man's field for mining, as he may with a pan or a rocker wash the gold out of the gravel. But with free milling ore which yields \$10 to \$20 or \$30 per ton, and a mill of five or ten stamps which can be set up and fully equipped at a cost of \$5,000 to \$10,000, there is ample encouragement for a venture by the mining man who knows his business, and is possessed of even modest means. Between such an enterprise and one which requires an outlay of \$500,000 for a smelting plant, there is a contrast which ought to tell most favorably for the gold field of northwestern Ontario, and there is good reason for the hope that it is now beginning to do so. Already there are large investments of British and American capital, as well as some Canadian capital in properties on Lake of the Woods and along the Seine river, and in a few months at the outside enough work will probably have been done to make or mar the fortune of the district as a gold field. With four such valuable metals as iron, copper, nickel and gold being produced in the country, and with confidence that the ores of these metals exist in abounding quantities, there ought to be no doubt as to the future of our mining industry, however much it may be regretted that operations are not being carried on with greater activity and enterprise than is now apparent."

Besides the statistics of mineral lands sold and leased by the Province, the quantities and values of metallic and non-metallic mineral production during the year the report deals in an interesting manner with a variety of subjects relating to the development and progress of mining in Ontario, not the least notable of which is Dr. A. P. Coleman's second report on the Gold Fields of Western Ontario. The volume is handsomely illustrated and is accompanied by a geological map of the regions of the Seine River and Rainy Lake and of the Manitou and Wabigoon Rivers, with all surveyed mining locations duly noted—a feature which will be greatly appreciated by prospectors and miners interested in that section of the country.

Simultaneously with the publication of Mr. Blue's Annual Report there has been issued by the Geological Survey the Shebandowan Sheet (No. 9) of the Geological map of Western Ontario. This is chiefly the work of Mr. W. McInnes and completes the series of maps covering the main run of the gold and iron bearing belt of the Keewatin or Huronian rocks, from the Lake of the Woods to Lake Superior. This is a very superior production well engraved and beautifully printed showing as much on its scale of four miles to the inch as a coarse map might show on a much larger scale. It is worthy of note that the Survey's maps of this series including those of Rainy Lake and the Seine River have been reproduced by the Ontario Bureau of Mines in its reports as the only authentic ones of the district. In the report of that Bureau for 1896, when it appears, we may hope to find reproductions of the sheet just issued by Mr. McInnes. This excellent map may be obtained from the Survey for the nominal price of ten cents. Mr. McInnes, it may be stated, will shortly complete for publication a geological report including the areas covered by this sheet and that previously issued of the Seine River.

The great difficulty met with by the Geological Survey of the Dominion is the want of sufficiently accurate topographical maps in the various provinces. In the North West Territories and even in the Rocky Mountains, where the Dominion Lands Survey has carried on its work, such maps exist, but the geographical portion of many important points in the several provinces is actually not known within a mile or two, while no attempt has been made by the provincial sur-

vveyors to indicate the relief of the country, its hills and valleys, with the least accuracy. Given a good topographical map of any district, the work of the geologist becomes comparatively simple, and the progress of geological mapping is vastly accelerated—on the other hand, when, as in the map here particularly referred to, every lake and stream has to be laboriously delineated by the geologist himself or his assistant, but a comparatively small number of square miles can be covered in the course of the year.

In our last issue we remarked upon the philanthropic endeavor of one Leofred to promote a Mining Bureau in Montreal and thereby secure for himself some much needed employment and a comfortable living at the public expense. Since then the Bureau scheme having fizzled out, this genius has been pestering our mine managers and engineers with an invitation to join what he is pleased to designate an "Academy of Mining Advancement. His letter which by the way is written on House of Commons note paper and is franked postage free by some innocent M. P. is a curiosity and as such we reproduce it:

Ottawa, 26 September 1896.

DEAR SIR:

Will you accept to be a member of the "Academy of Mining Advancement?" The object is to secure a better knowledge of mining. Seven years of continuous practice, as a mining engineer, is one of the titles to membership.

The place and date of meeting are to be fixed by the majority.

No fees whatever are to be collected from the members.

I have the honour to be, Dear Sir,

Yours truly,

A. LEOFRED.

Mr. Leofred is not a member of any of our mining organisations—not now—possibly it was a reminiscence of his association with one of them that prompted this very pathetic and significant suggestion of 'no fees.' Perhaps, too, he might enlighten us as to his mining experience and inform us if he ever had charge of a mine in Canada, or elsewhere, and if the stipulation of "seven years continuous practice" would not debar him from a membership in his own quixotic academy.

The first 24 parts of the first volume of the proceedings of the Canadian Mining Institute, being the transactions of the Mining Society of N. S., the General Mining Association of Quebec and the Ontario Mining Institute have been issued to members. Mr. C. W. Percy, M. E., reviews the journal in the *Science and Art of Mining* as follows:

"The three mining institutes above named have severally and separately for some time rendered good service to Canadian Mining, and latterly have come to the conclusion that whilst not sacrificing individuality they might on federal lines do good to each other; hence the Federation now known as the Canadian Mining Institute, which will publish all the transactions, issue them to all the members, and hold occasional meetings of the federal body. The first series of transactions kindly placed at our disposal by the Secretary-Treasurer Mr. B. T. A. Bell, is striking evidence of the value of the federation. The Mining Society of Nova Scotia occupies 12 parts, containing papers as follows:—Notes on the Collection of Nova Scotia Minerals, being prepared for the Imperial Institute, London, by the Government of Nova Scotia; Surface Surveys and the Necessity of Contour Surveys in the Gold Districts of Nova Scotia. A Novelty in Mine Ventilation; Notes on the Behaviour of some Gold Solvents; Nova Scotia coals as Steam Producers; the Grand Lake Coal-field of New Brunswick, How an Abandoned Mine became a Paying One; Notes on Compressed Air, a Newfoundland Iron Deposit; Occurrence of Galena at Smithfield, Nova Scotia, a Mineralised Zone in Nova Scotia; the Capacities of Coal-cutting Machines. The General Mining Association of the Province of Quebec is responsible for six parts, comprising papers:—The Trail Creek Gold Mining District of British Columbia; the Quebec Mining Act; the Gold Deposits of the Eastern Townships;

Water Tube Boilers; the Canadian Pig-iron industry; the Manufacture and Uses of Wire Rope. The Ontario Mining Institute also occupies six parts, containing papers:—Ontario as a Mining Country; Mining in Thunder Bay District; the Financial Aspect of Mining; Improvements in the Dressing of Gold Ores; the Value of Careful and Complete Analysis of Rocks and Minerals; Exploring with the Government Diamond Drill. We think our readers will agree that the Canadian Mining Institute has commenced well and already justified its existence. In point of variety, and value in that variety, no mining institute in any country has ever placed before its members a better collection of papers. All leaders of mining and kindred industries in the Dominion should be members of the Canadian Mining Institute, they will find it an excellent investment."

We cordially commend to the attention of our student readers, underground managers and those of our miners who are qualifying for a certificate the very excellent series of Handbooks for mining students and Colliery Managers published under the auspices of *Science and Art in Mining* of Wigan England. These excellent class-books contain a mass of information condensed into practical form. Part I. embraces Geology, Surveying, Lighting of Mines and the Coal Mines Regulation Act; Part II. Boilers and Fittings, Heat and Steam, and Steam and other Engines; Part III. The Furnace and other Methods and Problems in Ventilation, Ventilation by Machinery, and on the Anemometer, Barometer, Thermometer and Water Gauge. Part IV. on Boring and Sinking, Methods of Coal Working and Blasting in Coal Mines. These can be had for something like 15 cents a part (seven pence postpaid.) Other parts on similar lines are, we believe, in preparation and the work when complete will constitute one of the very best of our students' text-books, covering the whole range of mining operations. Each part is complete in itself, and is specially prepared by practical men for practical men.

In the midst of the general depression, when iron and steel products are moving so slowly, it is satisfactory to note that at least one department of the metal market shows prosperity. This is the copper trade. Although the domestic demand has been quite slack, prices have held up very well. The European demand has been very good and has sustained prices. Those who have watched the trade say that the outward movement has been maintained at a very high rate all this year, clearly indicating an unprecedented consumption in Europe. Foreign requirements have necessitated the shipment abroad of 199,812,480 pounds of fine copper during the first nine months of 1896, against 168,421,760 pounds during the same period in 1895. Notwithstanding these enormous exports, the total visible supply of copper in England and France and afloat thereto from Chili and Australia is 18,693 tons less than a year ago. The extent of the export movement is shown in the fact that the export of copper from the United States, from January to September, inclusive, averaged 22,201,386 pounds per month which is equivalent to more than the entire output of eight of the leading mining companies for the nine months of the year.

It is not surprising therefore that prospects in the copper trade are good. If electrical developments continue to increase, the demand for copper will keep on growing, and American copper interests will be prosperous.

Notwithstanding all the study that has been given to the subject, and the numerous practical endeavours that have been undertaken, it is doubtful if the real cost of making steam is ever very accurately determined. The basis assumed in the computation is usually imperfect. Boiler performance is usually stated in the number of pounds of water that it can evaporate for every pound of coal, or other combustible consumed. That is perhaps as good a basis for ready comparison as could be used; but there are other costs connected with the raising and use of steam which are hardly ever taken into account, and which often bear a surprisingly large proportion to the total. Our United States con-

temporary, *Power*, says it would be interesting to know the cost of producing power outside of the coal bill. To the cost of attendants add the interest on the cost of the plant, insurance, depreciation, and repairs, supplies other than fuel or water, such as oil, waste, packing, etc., and divide this by the average horse power developed, and the number of hours run per year. In this way would be ascertained the cost per hourly horse power of running the plant, exclusive of the fuel bill, a figure which would be comparable with similar costs over a wider area, and it would be very instructive to see how these costs compared with each other, and what proportion they bore to the fuel cost of the same plant.

It is worthy of notice that many of the inhabitants of United States east of the Mississippi, seem to regard the occupation of mining, whether for gold or other metal, with considerable suspicion. When a person puts his money into this industry, or becomes in any way connected with it, grave doubts begin to be entertained as to his commercial integrity. The *Mining Journal* thinks it is satisfactory that these views are not shared, or in any way upheld, by the English capitalist. While not for a moment defending those dishonest speculators who promote mining operations heedless of the proper methods for ensuring permanent success, it strongly condemns the very unfair and partial criticisms bestowed upon the efforts of *bona fide* miners to work ground proved to contain metalliferous ore bodies. While there are always exceptions, judicious management as a rule has been able to secure fair returns for the money invested. The country in which the operations are carried on generally derives immense benefits from the industry. It has often been the means of covering large tracts of barren ground with the dwellings of those engaged in the work. Moreover, the engineering trade has been largely supported by the enormous amount of machinery required for dealing with the ore. Perhaps the most important objection which the Americans raise against mining is the one that applies with equal justice to many other industries—it is a hazardous speculation. It would be ridiculous to suggest that all, or nearly all, the mining ventures offered to the public are sound. Many unscrupulous persons are on the alert to beguile the unwary investor. But if the same care and discretion be applied to this as to any other business undertaking, the risks may be reduced very materially. The ordinary business principles have only to be adhered to in order to ensure success, and there is no reason why those engaged in legitimate mining transactions should be made to suffer in reputation.

Some curious information respecting Western Australian mines and mining finds its way into London papers. For instance, the Westralian correspondent to *Money* writes: "It seems almost impossible to make a mistake at Hannan's. A blind man walking out on the fifteen miles of reef which ran through the town, and pegging out, would be certain to get something if he only went deep enough. I believe that in the early days the brookman crowd did peg out blind, and the result has been that the Associated Mines have got some of the finest properties on the field. . . . As, I say, you cannot go wrong at Hannan's. Almost everything has got gold in it. In fact, dry-blowers, when they get very hard up, take to prospecting in the street, which is about two feet deep in camel dung, waste paper, and gold dust." In another part of the paper our weekly contemporary waxes wroth at the "promoters' traps" which are set to catch the unwary investor. "The columns of the daily papers are filled," it says, "with prospectuses of some of the greatest dead heads that ever masqueraded as remunerative investments." Some of them, no doubt, hail from Hannan's, where "you cannot go wrong."

William Smith & Co., of Bristol, England, supplied the following statistics of the phosphate business in Europe. Consumption in 1840, 3,000 tons; in 1850, 15,000; in 1860, 50,000; in 1870, 75,000; in

1880, 250,000; in 1890, 1,200,000; in 1893, 1,500,000; and in 1895, 1,865,000. The sources for 1895 were: Florida, 537,731 tons; South Carolina, 431,375; Tennessee, 30,000; France, 400,000, Belgium, 300,000; Algeria, 136,000; Norway, Canada and Aruba (together), 30,000; making a total consumption of 1,865,106 tons.

We clip the following from the Australian *Mining Standard*: The country reporter is always a thing of beauty to the general reader, and a joy for even the sub-editor. He is both immortal and irrepresible, and though remorselessly run through with a blue pencil times out of number he still comes up smiling and absolutely imperturbable. Mining reporting gives him a grand field for the exercise of a vivid imagination and a descriptive faculty which scorns merely to coast along the headlands of truth, but steers full and by for the deep blue of unadulterated romance. When to this the poetic temperament is superadded the country mining reporter frequently finds himself badly handicapped in his effort to give expression for his aspirations, while still keeping to the subject of ground grovellings for yellow dross, but the *Otago Daily Witness* has a genius who can rise superior even to these difficulties, and this is how he recently chronicled the death of an old West Coast mining "hatter." "Last Tuesday morning, whilst the sun was shining brightly, Mr. Edward Dobson, one of the first gold-diggers of Hatters' Terrace, Upper Totara River (Koss), changed his venu of materialism for that of the dread unknown. Brought down some three weeks back by willing hands from lone Hatters (which once bustling centre he had discovered, and since then labored there continuously for over thirty years) he lay in the local hospital till he died. Deceased not only discovered Hatters, but also the richest claim there, out of which more than one mate made a fortune. 'So thickly did the gold lie in the bottom of the paddock that men ere leaving there were compelled to wash their boots,' says my informant, an eye witness; 'and,' adds he, 'I have fetched to town as much as 20lb. weight of gold at one time from this claim.' However, Edward Dobson is gone, and let us hope he'll bottom on gold at the 'new rush.'" The introduction of the shining sun, the change of his venu of materialism, and the dread unknown, are touches of poesy that the shade of Tennyson might envy, but it is rather rough on the defunct Dobson, to doubt whether he will bottom on gold where the streets are paved with it, or—The rest is silence.

A very curious doctrine has been propounded by a writer on mining topics, namely, that assay results are of no value, and should not be published by newspapers. If assays are of no value why are they made, and if they are made why should not the results be published, especially, as in most cases, the prospector depends upon outside capital for developing his "find?" If the writer in question was prospecting, and came upon any likely "show," he would probably have it assayed and communicate the results to other persons. And if to other persons why not to the newspaper reading public? What is there in the nature of an assay that requires it to be kept secret? It is part of the regular business of the miner, and the business of the mining paper is to chronicle the miners' doings. We may freely grant that publication of assay results is liable to glaring falsification, and that, as a matter of fact it is grossly abused. But there is nothing in the wide world which is not abused. To say that anything is abused is no valid argument against its use. If it were, nothing could be used. The remedy is to keep before the public the fact that assay results, even when the specimen assayed was really taken from the property it is reported to have come from (which is not always the case), are only reliable for what they are worth. The fact that a rich specimen was taken from a reef or lode does not demonstrate that the whole reef or lode is of similar quality. It does not even demonstrate its existence one foot further than it has actually been opened up. Moreover, the result of the assay may be, and often is, affected by chance or manipulation. Most speci-

mens consist of a certain quantity of valuable mineral and a certain quantity of the matrix or gangue. The more quartz or gangue is broken off the more sensational becomes the resulting per centage of gold or other metals. Therefore, no one of experience places any more reliance on assays than as simply raising a certain presumption that the reef or lode is worth working, provided the persons responsible for them are reasonably trustworthy. Nothing is more common than to have it stated that assays taken "right across the face" gave an average of 10 or 15 or 20 ozs. to the ton, but very seldom indeed are these glowing statements verified. The explanation is either that consciously or unconsciously, the person taking the assays picks the stone or else that he is imposed upon by some designing persons. That results professedly derived from assays require to be received with the greatest caution, and can by no means be relied upon unless every step of the process has been rigorously verified, we may freely admit. But that is very different from saying that the results of assays should not be published.

The mineral production of Ontario in 1895 included: Building stone—\$438,000; cement (natural rock), \$45,145; cement (Portland), \$114,332; lime, \$280,000; drain tile, \$157,000; common brick, \$705,000; pressed brick, \$115,695; pressed brick (fancy), \$24,075; roofing tile, \$6,200; terra cotta, \$38,500; sewer pipe, \$133,159; pottery, \$108,000; gypsum, \$7,471; calcined plaster, \$13,095; mica, \$2,900; salt, \$188,101; nickel, \$404,861; copper, \$160,913; gold, \$50,281; petroleum (illuminating oil), \$1,237,328; lubricating oil, \$205,591; other oils, \$285,308; paraffin wax, \$36,608; fuel product, \$79,589; natural gas, 282,986; amounting to an estimated total value of \$5,170,138.

The production of Ontario mines yielding nickel and copper ore and the quantity of ore smelted in the four years 1892-5, ending 31st October each year, is presented in the following table:

YEAR.	Ore raised, tons.	Ore smelted, tons.	Per cent. of metallic contents in ore smelted.		
			Nickel.	Copper.	Cobalt.
1892	72,349	61,924	3.36	3.19	.1007
1893	64,043	63,944	2.21	2.38	.0800
1894	112,037	87,916	2.92	3.14	.0721
1895	75,439	86,546	2.67	2.73

For nearly the whole of last year only the mines and works of the Canadian Copper Company were operated; two of the other companies had closed down owing to the death of the principal men in each, and a third company had suspended owing to financial troubles. Yet it will be noticed that the quantities of ore raised and smelted in 1895 were larger than in 1891 or 1893, and the quantity smelted was nearly as large as in 1894 when the furnaces of four companies were in blast. The percentage of nickel and copper in the ores varies considerably, but the difference is not so great as to be significant; it was larger in 1895 than in 1893, though smaller than in 1892 and 1894, both of copper and nickel.

Comparative statistics of the industry are presented in the next table:

	1892.	1893.	1894.	1895.
Ore raised.....tons	72,349	64,043	112,037	75,439
Ore smelted....."	61,924	63,944	87,916	86,546
Ordinary matte....."	6,278	7,176	10,410	12,525
Bessemerized matte....."	1,880	452	1,470	103½
Nickel contents....."	2,082	1,653	2,570½	2,315½
Copper contents....."	1,986	1,431	2,748	2,365½
Cobalt contents....."	8½	19	8½
Value of nickel.....\$	590,902	454,702	612,724	404,861
Value of copper.....\$	232,135	115,200	195,750	160,913
Value of cobalt.....\$	3,713	9,400	1,500
Wages paid.....\$	339,321	252,516	311,719	209,960
Men employed.....	690	495	655	444

The metallic contents were larger very considerably than in 1892 or 1893, but smaller than in 1894. Values too show a depreciation, no doubt as a result of improved processes in extracting and refining the metals, but especially the nickel. With the cheapening of metal new uses are sure to be found for which must increase the demand, and it seems probable that for no other object is it so likely to be required as for the manufacture of nickel steel. One company of bicycle manufacturers in the United States used last year 400,000 lb. of nickel in the form of nickel steel alloy, which is nearly one-tenth of the total product of the Ontario mines.

The values in the foregoing table are based on the selling price of the matte at the works, and employing the same data the prices of the metallic contents for the four years 1892-5 per ton and per pound are found to be :

YEAR,	Nickel.		Copper.		Cobalt.	
	per ton.	per lb.	per ton.	per lb.	per ton.	per lb.
1892.....	\$ 289.81	cents. 14.190	\$ 119.90	cents. 5.985	\$ 436.82	cents. 21.841
1893.....	275.08	13.754	80.50	4.025	494.73	24.736
1894.....	238.36	11.918	71.23	3.561	461.54	23.077
1895.....	174.83	8.741	68.02	3.401

The fall in price of both nickel and copper has been constant from year to year, and corresponds closely with the market quotations of the refined metals in the London market.

Canada as a Field for Mining Investment.

BY DR. G. M. DAWSON, C.M.G., OTTAWA.*

Canada has never yet become widely recognized as a country possessed of a great future in respect of its mineral wealth. In the official reports of exports from the Dominion, the produce of agriculture, fisheries, forests, animals and their produce, and even manufactured articles, have all largely exceeded in value the total export of minerals. The value of minerals produced in Canada has, nevertheless, for some time, been steadily increasing each year, and in 1895 amounted to over \$22,500,000. But this increase, satisfactory enough in itself, does not fully evidence the development which is now about to occur as the outcome of new and exceptional conditions. It is more particularly in the western province of the Dominion, British Columbia, that epoch-making progress of this kind has begun; but its effect will not be confined to that province, for what is gained there must indirectly assist in bringing the necessary skill and capital to bear upon many minerals of the older provinces, the development of which has heretofore either languished or has been pursued with intermittent success, alternating with periods of stagnation. Such disappointments have too often been due to the practical worthlessness or insignificance of the deposits or undeveloped "prospects" foisted upon the public under the name of "mines" but in other cases really valuable properties have been over-capitalized or swamped by extravagant and incompetent management. In still other instances attempts have been made to work minerals which, although of value, do not yet admit of profitable exploitation under the local economic conditions, but which have absorbed considerable amounts of capital without at any time having afforded the least hope of becoming paying investments. Similar circumstances have, no doubt, attended the history of every mining region; but Canada has perhaps suffered exceptionally in this way in the past.

Returning after this digression to British Columbia, it may be interesting to trace in a few words the short history of mining in that province, which promises very soon to produce each year more from its mines than the aggregate yield of all the remaining provinces of Canada. "Placer," or alluvial gold, was discovered on the Thompson in 1857, and although coal had been found to exist, on Vancouver Island many years previously, the country—then an isolated and remote colony—had re-

mained practically a fur preserve of the Hudson's Bay Company, where the most important news, slowly conveyed by the annual "brigades," was the price of beaver skins in London. All this was at once changed by an influx of gold miners, pressing on from point to point against great difficulties, of which many a thrilling tale remains to be told. In 1863, the "golden year" of Cariboo, nearly \$4,000,000 in gold is estimated to have been produced, a result which, in proportion to the areas worked and the population actually engaged, was phenomenal. From this time the output decreased year by year as the comparatively limited known tracts became exhausted which were adopted for the somewhat crude methods of work possible in places very remote from efficient means of communication.

Meanwhile, the mining of the precious metals was proceeding by leaps and bounds in the Western States of the American Union, similar geographically and geologically, in position and character, to British Columbia, until there appeared to be some real basis for the assertion, often jestingly made, that Providence has stored all the metalliferous wealth of the continent to the south of the international boundary. To those familiar with the circumstances, there were other reasons for this slackness of development in the north, which need not here be detailed, but chief among them was the absence of the requisite facilities of transport, and thus concurrently with the completion of the western part of the Canadian Pacific Railway, a new era began, and in a very short time the local conditions have been largely reversed. In West and East Kootenay everywhere within reasonable distance of railway lines, mining camps began to spring up upon groups of rich deposits carrying silver and gold. The depreciation of silver, which became serious about the same time, has undoubtedly retarded the opening up of some of these deposits, but where they are rich enough to be very profitably worked with silver at fifty cents to the ounce, as is the case with a large proportion of the Kootenay ores, this is rather a sentimental than a real drawback, and one which has already been largely overcome. Other deposits producing gold, with copper as a by-product, have been affected only sympathetically.

The principal mining sub-districts so far established in West Kootenay are, nearly in order of their discovery, Nelson, Ainsworth, Slocan and Trail. Nelson includes the Hall mines, yielding copper and silver, beside silver-lead ores, and some containing gold. Ainsworth and Slocan are characterized by silver-lead ores, with some yielding gold and other metals, particularly in the last-named sub-district. Trail, although later in claiming its place, has already surpassed the older "camps" in the matter of development and interest on the part of the mining world. Its deposits of auriferous pyrrhotites are probably unique; the veins as far as developed are of extraordinary dimensions and frequency, and several mines have even now reached the stage of paying handsome monthly dividends. The town of Rossland, in Trail district, is estimated to have a population exceeding 3,000, though but a few months old.

For these several mining centres, although so young, railways have already been built, mining machinery of all kinds has been introduced, several large smelters, both for reducing silver-lead ores and for matteing have been established, and from them the output is daily increasing. Perhaps a better idea of the amount of activity in prospecting and mining (although the latter is not more than in its initial stages) may be given by quoting a few figures. Thus, in 1895, over 3,000 new mineral claims were registered in West Kootenay alone. About fifty properties in all have become "shipping mines" on a greater or smaller scale, from which the aggregate output in 1895 is valued at about \$2,100,000, comprising silver to the value of \$739,000 and gold \$679,500, followed by lead and copper representing smaller amounts. For the first six months of the present year the value of the output is estimated at over \$2,200,000.

Time does not serve to allude individually to the several "camps" of West Kootenay, nor to more than accord mention to the large district of East Kootenay, which has been to some extent outstripped for the moment, although everywhere the most hopeful spirit prevails, and in a large number of cases important deposits are being opened up, wherever that confidence leading to the investment of money can be gained. Other notable districts in the southern part of British Columbia are Boundary Creek, from which remarkable ores containing tellurium with gold and silver come, and in which immense deposits of copper ores are found, Okanagan, noted chiefly for free-milling gold quartz, Similkameen

*National Review for October.

in which placer gold and platinum are being worked, and Cayoosh Creek with rich gold-bearing quartz-veins.

On the coast, from Alberni and other points, most satisfactory reports begin to come, although but little in the way of actual returns has yet been achieved. To the north, and as yet some 200 miles distant from any railway, Cariboo, which in early years proved to be so rich a find for the placer miner, has come to the front again as the site of extensive hydraulic mining operations, dealing on the large scale with comparatively low-grade auriferous gravels by methods already perfected by practice in California. The rapid and full-fed rivers of the district prevent the occurrence here of any questions of damage to cultivated lands from such mining operations while streams and lake-reservoirs in the mountains provide ample supplies of water at every desired level. Many years ago, the writer maintained, with special reference to this district, that a development of the kind now taking place was certain to occur, relying upon the fact that in every such region the highly concentrated old stream-gravels, which were alone susceptible of profitable exploitation by comparatively primitive methods, must be associated with much widely spread but less rich deposits: a forecast which is fully realized by the work now in progress.

Another interesting feature that may be mentioned in passing, is the amount of money now being carefully spent in placing extensive dredging plants of various types along a great part of the length of the Fraser River, which may be regarded as the great natural "ground-slucice" of the country, but of which the bed and deeper bars could never be reached or worked by the early miners. The quartz-veins of the Cariboo district as yet await development.

In writing of the prospective value of British Columbia as a mining country some years ago, and when but little progress had been made towards its realization, it was pointed out that this province (some 390,000 square-miles in area) with the Yukon district of the North-West Territory of Canada, together contain over 1,200 miles in length of the most important metalliferous region of the continent, that of the Cordillera or Rocky Mountain belt; a length equivalent to that included in the whole United States, from the 49th parallel to Mexico. The actual initial development of a permanent kind in this vast tract has, so far, been principally confined to a few districts of comparatively limited size, but there is every reason to believe, from the known geological conditions, and from analogy with the corresponding region to the south, that as skilled prospecting is extended from point to point, a mining country fully comparable with that of the entire western tier of States of the American Union will be found to exist. This development will take time, and must be supported by the opening up of paying properties, such as to attract the necessary financial backing. The prospector, generally poor, if enthusiastic and enterprising, first enters the field; following him come those provided with a limited amount of capital acquiring, at comparatively small cost, the claims which he may have staked out. To such speculative investors many failures with some large prizes must occur, but the disposition to enter into ventures of the kind is characteristic of the local capitalist of the West, who has already largely interested himself in British Columbia. At a certain interval, when the "prospect" has been converted into a running mine, with a developed body of ore in sight and capable of yielding certain dividends for some time, the larger capitalist, requiring no more than a fair return for his money without undue risk, enters the field, ready to pay a good price for what he requires. All stages of this progress may already be found in British Columbia alone, where there is ample room, and where opportunities of every kind will continue to occur for many years to come. It is devoutly to be hoped that the process of expansion, although certain to be rapid, will continue to be sane, and that the conditions of a "boom" may be avoided by the exercise of proper caution on the part of investors. It may be taken for granted that many undeveloped properties or worthless claims will be offered to the public as "investments." The purchaser cannot himself be familiar with the facts in most cases, but he should, at least, require the report of some reputable authority, made wholly in his interest.

Little need be said of the coal mines in British Columbia in the present connection, for these, in the region of the coast and where already open to commerce, have long passed the stage at which any difficulty

was found in establishing confidence for their operation. They are in the hands of strong corporations, and their output is limited only by the dimensions of the profitable market, in which they compete, along the west coast, with the coals of Great Britain, New South Wales, and the State of Washington. The production now average about a million tons annually. New fields, however, remain to be opened up when called for, even on the coast, particularly in the Queen Charlotte Islands. In the interior region, in the Crow's Nest Pass and the Nicola Valley, as well as in other districts still further from means of communication, important deposits of coal are known to exist. That of the Crow's Nest Pass has been shown by the Geological Survey to be an exceptionally valuable one, and about one hundred miles of railway only are required to connect it with the metalliferous mines of West Kootenay, where at present some considerable part of the fuel employed in smelting is Welsh coke, costing about fifteen dollars a ton. The coal mines on the line of the Canadian Pacific Railway, near Canmore, although politically included in the district of Alberta, also geographically belong to the Rocky Mountain region. They yield anthracite and steam-coal, of which the output is here again restricted only by the demand.

In writing thus first and at some length of British Columbia, I have placed in the front that region of Canada which affords now the greatest opportunities, and of which the product in metallic minerals may very probably for some time to come increase two-fold each year; but in doing so the resources of that part of the Dominion to the east of the Rocky Mountains must not be overlooked. The North-West Territory and Manitoba—speaking only of the southern moiety of that great interior region which has already been rendered easy of access by railways and roads—is pre-eminently a land for agriculture and stock-raising, but a great area is now known to be underlain by beds of coal, or of lignite-coal, often excellent fuels and everywhere available for local use. In a report on the southern part of what is now the District of Alberta, published more than ten years ago, the amount of coal contained in one of these beds in a known outcrop of sixty-six miles in length, and at an easily workable depth, was estimated at 330,000,000 tons. The mines at Lethbridge are situated upon one part of this particular deposit. The vast extent of these coal-fields of the North-West may be further evidenced by the fact that a rough estimate of their area between the 49th and 56th parallels amounts to 50,000 square-miles, than which there is probably no larger tract in the world known to be characterized by a practically continuous spread of valuable mineral fuels.

Natural gas, in important quantity, has also been found in several borings sunk for other purposes, and although not as yet utilized, the geological conditions indicate that a practically inexhaustible reservoir of this convenient fuel extends beneath a great area of country. Remarkable outcrops of "tar-sands," or sand impregnated with bituminous matter, found along the Athabasca River, support the belief that one of the most notable petroleum-bearing territories of the world there awaits development. Impressed by its probable importance, the Government has begun experimental boring operations, under the control of the Geological Survey, of which the results are awaited with great interest: and although it may not be assumed that the first or even the second boring must necessarily be successful, the eventual discovery of petroleum can scarcely be considered doubtful.

So much space has been given in foregoing paragraphs to the western half of Canada, that but slight mention can now be accorded to the mineral resources of the older eastern provinces. These are already better known and more fully utilized wherever the actual conditions permit this to be done profitably; but there remain numerous instances in which the products command a world-wide market, and in which rapid expansion may legitimately be anticipated.

The rocks of the Huronian system of geologists, have long been recognized as of particular interest economically, because of the association with them of various metallic minerals, among which copper, nickel, iron and gold have so far proved to be the most important. The nickeliferous pyrrhotites and copper ores of Sudbury are already favourably known to metallurgists, and the mines actually in operation are fully supplying the growing demand for nickel. At the moment, the most promising field for investment in western Ontario, undoubtedly occurs in connection with gold-mining. The existence of gold-bearing quartz-veins

in the Huronian rocks has been known for many years, but of late, a few well equipped though small mining and milling plants have been established, chiefly on the picturesque shores of the Lake of the Woods, and discovery is being very actively pushed throughout a wide belt of country running thence nearly to the border of Lake Superior, and including Rainy Lake, Seine River, Manitou Lakes, and a plexus of other smaller river and lakes. There can be no reasonable doubt of the value of a considerable proportion of the properties taken up, and under skilled advice, with the necessary capital for bonding and opening out groups of claims in an experimental way with a view to the purchase of those proving to be satisfactory, the conditions here appear to be now most favorable to judicious investment.

On this region Professor A. P. Coleman, of the Ontario Bureau of Mines, makes the following remarks, which appear to me to be sound and judicious: "Gold presents the brightest outlook of all for speedy expansion, especially in the part of the province west of Lake Superior; and I fully expect to see a well-established goldmining industry there within a few years, something of a quiet and permanent character, like that of Nova Scotia, but on a larger scale, since the extent of our gold-field is much greater."

While speaking of this western part of Ontario, a word may be added respecting the exceptionally rich silver deposits of the vicinity of Thunder Bay, from which although comprised within a limited area, several million dollars worth of silver have already been drawn. These at the present time are idle, but they appear to wait only a more systematic method of working of a collective character to renew their importance.

Chief among the mineral industries of the southern or peninsular part of Ontario, are the production of petroleum, salt, natural gas, gypsum, and materials of construction of all kinds. These, however, have become established domestic industries, in respect to which the need of additional capital is not much felt.

Iron ores of excellent quality abound in many parts of Ontario and Quebec, and a limited amount of iron is already produced in both provinces, but the absence of adjacent coal deposits, with the duty maintained against ores by the United States, render the mining and smelting of iron subject entirely to tariff provisions.

The mining of apatite or "phosphate," at one time considerable, and from which much was hoped, particularly in certain districts of Quebec, has of late years become unprofitable because of competition of cheaper, though lower grade, foreign minerals applicable to the manufacture of fertilizers. In these very districts, however, the production of mica for electrical purposes has since largely taken the place of the older industry, while the mining of graphite and its treatment by improved processes, has been renewed with every prospect of success, both in these parts of Quebec and in Ontario.

In respect to asbestos (chrysotile) of the first quality, Quebec stands almost alone as a producer, and from a limited tract supplies the greater part of this material used in the arts, the business being in the hands of a few well-organized companies. Chromic iron, from the same district, is now attracting some attention. Copper-pyrites is raised in considerable quantities about Capelton and shipped to works in the United States, where it is also used as a sulphur-ore. Gold-mining, in the Chaudiere country, has never yet become an established industry of a large kind, but renewed efforts are now being made in this direction, with the aid of modern knowledge and appliances suited to the working of such alluvial deposits as occur there. Slate of excellent quality is produced in quantity sufficient for local demands in a neighbouring part of the province, where numerous handsome varieties of marble also exist, although as yet scarcely worked.

Turning to the maritime provinces, of which Nova Scotia is the richest in minerals, coal is found to be of predominant importance, with an output of about two and a half million tons each year. The coal mines of Nova Scotia have been in operation since 1827, and much of their product now finds its way up the St. Lawrence to Montreal, where it is used for manufacturing purposes, while shipments are also made to the New England States and to Newfoundland, and iron smelting and the manufacture of steel from local ores employ increasing quantities on the spot.

From 1861 the mining of gold-bearing quartz-veins has been prosecuted in Nova Scotia, and in the main with success, the annual product being

now about 20,000 ounces, maintained with considerable regularity. The nature of these veins has been carefully studied by officers of the Geological Survey, and has become well understood. They are found to follow the lines of anticlinal folds, in precisely the same manner with the well known reefs of Bendigo, in Australia, but the flexures are broader and farther apart in Nova Scotia, and the veins themselves appear to be more permanent in depth. The knowledge now gained of these veins renders it practicable and desirable that they should be worked in a larger way, combining series of parallel and adjacent deposits under a single management, and opening them up by means of one or two principal shafts. Much would be gained by this in economy and in the perfection of milling and concentrating machinery; and under careful management there is little doubt that the gold product of the province might be easily doubled within a few years.

Among other valuable minerals occurring in the maritime provinces are copper, manganese, antimony, oil-shales, and infusorial earth or "tripolite," but none of these have actually been produced as yet in very important quantity. Gypsum is abundant, and is somewhat extensively worked and exported, while of structural materials, the fine red syenite quarried and polished in New Brunswick may be specially mentioned.

Respecting most of the great northern extent of Canada, including not only the continental lands, but also the archipelago of the Arctic Ocean, comparatively little is as yet known, but in considering this region, with such slender information as we have of its geology, it may be taken for granted that beyond the limits of any profitable agriculture, important communities dependent on mining will eventually be formed, and that mining will yet become a main resource of these inhospitable lands. The enormous deposits of iron ores lately discovered in Northern Labrador by Mr. A. P. Low, constitute a reserve of this kind which may one day be drawn upon, and even in the more remote Arctic islands, placed upon the map by our intrepid explorers and whalers, minerals of value, including coals, have been found, which may not prove to lie entirely beyond the reach of modern civilization.

Of half a continent, embracing as Canada does in different parts of its extent the most varied geological conditions, it is not possible in a short article like this to even enumerate the minerals already discovered and the known districts of promise. It has been endeavoured to notice chiefly those fields which at the time present the most inviting prospects for the intelligent utilization of capital. Those parts of the Dominion, chiefly in the south, which can no longer be described as unexplored in a geographical sense, are now only beginning to reveal under patient and minute search many of their valuable ores. Of the country as a whole, it is safe to predict that the mineral wealth to be ultimately developed will not fall short of that of the United States, than which the extent of Canada is only slightly greater. This areal aspect of the question is chiefly useful, under due reservations, in enabling such a comparison to be established, for to the south of the international boundary the circumstances have already led to a vast development of the mining industry. This has resulted largely from the fact that to the virgin deposits laid bare by long processes of nature, it has been found possible to apply at once the most improved machinery and methods, coupled with great energy, as well as the support and confidence of capital, coming chiefly from abroad and lending itself on easy terms to the building of railroads and the opening of mines. This, of course, applies chiefly to the western third of the Union, where the development of mining has been almost everywhere concurrent with the introduction of railway communication, and of which the products have to a large extent depended for their value upon the prices ruling in the open markets of the world. The great expansion of the coal and iron industries of the eastern and southern States, having been initiated and fostered largely by tariff provisions, occupies a different plane. In Canada, a very similar course of progress is now beginning, particularly in the west, and every indication points to the conclusion that an opportunity, not often found in the course of industrial development, now offers itself to the profitable utilization of idle capital, within the limits of the Empire, under the safe-guard of British laws, and in a country where the monetization of silver or other form of repudiation of debt has never found so much as a responsible advocate.

The Seine River Gold Fields.

Mr. George W. Stuart, one of the oldest and most respected mining engineers in Nova Scotia, passed through Ottawa this month on his return from a visit of inspection to certain sections of the new Seine River Gold Fields which are just now attracting considerable attention. In conversation with a representative of the REVIEW Mr. Stewart said: "I visited the Seine River district in the interest of a number of Ottawa people interested in this section. Owing the lateness of the season, however, much valuable time was lost, first by the C.P.R. strike and next by the low water in the Rainy and Seine Rivers. I may say here that these rivers must have large expenditures made upon them as the navigation at several points is extremely difficult, either that or a line of railway must be constructed to make the country more readily accessible than it is at present. It took me six days to get from Rat Portage to Mines Centre on Shoal Lake, a distance of about 200 miles, the last twenty miles of which I had to canoe. My impressions of the country as a field for mining investment are on the whole, not unfavorable, notwithstanding the many frequent and extreme changes in the country rock. The veins showing gold, or panning gold, are not confined to any particular character of the changing formation yet all the veins that have been to any extent developed are in the altered granite, viz: those on the Ferguson, Lucky Coon and Foley properties. The Foley situated by the side of Shoal Lake has the greatest amount of development. There are seven veins open ranging from 10 in. to 3 ft. in thickness and more or less work done on all of them. One has a shaft 250 feet in depth, and levels of several hundred feet driven. A twenty stamp-mill is being constructed here by Fraser & Chalmers, and a large number of persons are employed. None of these veins have shown in their development any disposition to decline either in thickness or in the quality of the ore but rather the opposite. The Foley is undoubtedly a valuable property. The Ferguson had also several veins opened quite similar to the Foley, both in size and general character. The deepest shaft on any of the veins here is about 60 ft. This Company is taking the precaution of proving conclusively the value of its property before erecting a mill. The Lucky Coon has by long odds the strongest veins so far opened in the district, on two of which shafts are down to the depths of some 60 ft. to 80 ft. showing from 4 ft. to 9 ft. feet of ore. There is a five stamp mill on this property, but the works were at a standstill, I understood, pending the result of negotiations of a sale. I visited several surface indications where more or less gold could be seen or panned, but five inches of snow and ice drove me out of the district sooner than I desired. While, as I have said, my impressions of the chances of this section of country becoming a mining district are good, I cannot say that the intense excitement and general scramble for interests in the district are warranted. I would strongly advise the investing and speculating public to be cautious and to "keep their heads." I have not seen anything during my visit to warrant me in saying that the above section of country presents any better prospects for the production of the precious metals than does Nova Scotia, particularly when taking into consideration, conditions with respect to accessibility, general facilities, fuel, labor, etc. One thing I would urge on the local government is some restriction in regard to the acquisition of properties, or

locations. The principal number of so-called prospectors now in that country are what I would term "stakers." They no sooner locate a property, without even the semblance of a lead thereon than they are off locating another, until the whole country is now in the possession of this class of people. Some change in the law is absolutely necessary at least, if no labor or rental is required to hold locations it should be incumbent on the applicant to at least prove to the Bureau of Mines that he has discovered gold upon such location as applied for.

The Sultana Mine Dispute.

A peculiar and in fact unprecedented mining dispute has been settled by Hon. Mr. Gibson, Ontario Commissioner of Crown lands.

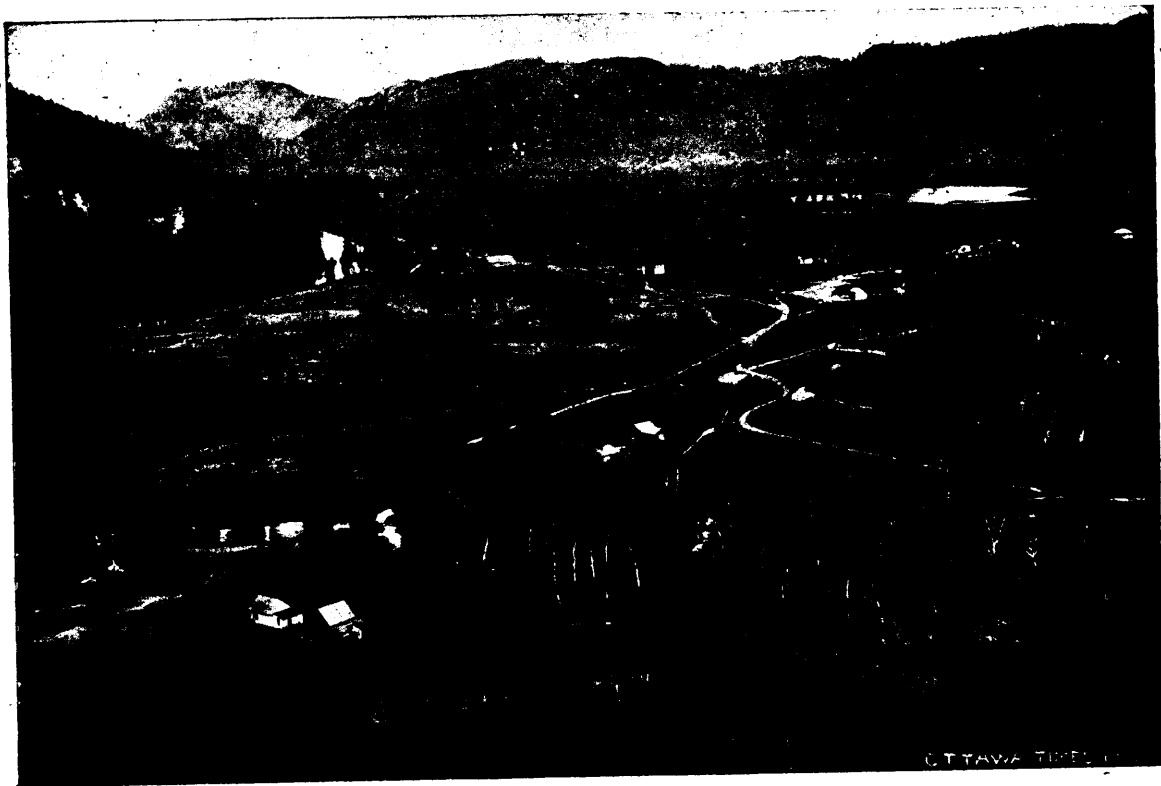
The parties concerned were: J. F. Caldwell, owner of the famous Sultana gold mine at Lake of the Woods, *versus* a Toronto and Ottawa syndicate. The Ottawa end are principally Mr. A. W. Fraser and Mr. W. A. Clark.

Mr. Caldwell is making a big profit out of the Sultana mine, something like \$50,000 a year, and his success has sent up mining rights in price all around that neighborhood. The Fraser-Clark syndicate had considerable mining claims near by, including several islands in the lake near the Sultana claim. The idea struck them of locating additional claims from their islands clear under the lake water to the Sultana shore, thus increasing their chances of striking the continuation of the Sultana gold vein. In some places there is 30 feet of water, but as that would not be an inseparable bar to successful mining, the syndicate saw no reason why they should not make the claim, and they did so.

This remarkable move was made last year, and there has been a desperate fight on ever since between Caldwell and the syndicate. There was no record in Canada of a mining claim being located on the bottom of a lake, and no precedents to follow.

While Hon Mr. Hardy was commissioner of Crown lands, the case came before him. The question was first whether the syndicate could locate a claim under water, and secondly if so, how near they should be allowed to go to the Sultana shore. Mr. Hardy ruled that a claim could be located on the bottom of a lake, but in view of Mr. Caldwell's work in pioneering the gold mining in the district, he made a special concession to Caldwell, ordering that the syndicate location should not approach the shore nearer than 300 feet, leaving the question of the disposition of the strip of water between the island and the location for future consideration.

That was how the matter stood when it came before Mr. Gibson. The argument before the new Commissioner took place about two weeks ago, Mr. S. H. Blake, Q.C., appearing for Mr. Caldwell, and Mr. J. M. Clark, Q.C., for the syndicate. The question was between Mr. Caldwell on the one side and Mr. Fraser on the other as to who should get the disputed territory, if it may be so called. Mr. Fraser had originally been granted 115 acres of land under water, and he applied for the reserved strip. Mr. Caldwell also put in a claim for it. The practical result of the Commissioner's decision is that Mr. Caldwell gets most of the 300 feet out from the Sultana shore. However, the syndicate are considered to have done very well by their sharp move.



THE MIDWAY TOWN SITE, B. C.

MINING NOTES.

QUEBEC

The Eustis Mining Co. has bought the Heplurn mining property two miles north of the Eustis mine at Capleton. The mine is being opened up and there is reported to be a very good showing of ore—chalcopyrite.

The Johnson's Company's output of asbestos from Thetford mines will run this year, it is estimated, about 1,500 tons. Something like 100 persons have found employment here during the summer.

King Bros. output of asbestos will, it is thought, reach at least 1,000 tons. New fibreizing machinery has been put in here lately. A large quantity of very fine No. I. and No. II. has been turned out here this season. Since the demise of Mr. Wm. King, Mr. B. J. Bennett has been superintending the work.

At the Belis' Company's Thetford Mines 300 persons have been employed all summer, and this force will be continued until the end of the year. The output of asbestos of all grades will aggregate between 3,500 and 4,000 tons. Great improvements have been made here in recent years, in the preparation of the various grades for the market, notably in the lower grades. No. III., or waste, a grade which the company at one time produced, fully 2,000 tons a year, has been entirely done away with and in its place the company produce nothing but fine fibre which will run from 95 to 98 per cent asbestos. Altogether the combined output of asbestos from Thetford mines will, it is expected, be in excess of any previous year. Prices are still low, but the outlook for improvement in this regard is more hopeful.

The Danville Asbestos Company's plant, which is of the latest type and contains the most improved machinery, is described in the last issue of the *Mineral Industry* as follows:

This mine was formerly the Jeffrey asbestos mine, the product of which was known both in Europe and America for its whiteness and peculiar silk-like quality. Mr. Jeffrey, the former proprietor died some time ago, and the mine has since passed into the hands of a new company with abundant capital, the manager of which realized that a change in the methods of working was necessary in order to secure a larger output, which they believed the property was able to furnish. After testing and examining the deposit by blasting in various places and treating the resulting rock, they came to the conclusion that the mine could produce a larger amount than any other of the kind in Canada, the test showing from 25 per cent to as high as 90 per cent of true asbestos fibre in the rock. The company's next step was to secure markets for the product, and it is understood that it has made contracts to furnish an amount as high as 5,000 tons a year. To supply this it has been necessary to put up large reduction works, which are now completed. The main factory building is 160 x 70 feet, and five stories in height, solidly built of the best material, the posts being 12 x 12 in. s. t. 10 feet apart, and everything in proportion, while the whole building is excellently lighted. The roof is flat and is covered with asbestos, and in building more attention has been paid to outside appearance and ornament than is customary in mining buildings. A second building is now being erected adjoining the first, 100 x 70 feet in size. On the first floor of the larger building there are 6 rock crushers, 2 of 35 tons each with double jaws, and the other 4 of smaller size, the least being 7 tons. Next to the crushers are sets of Cornish rolls and a revolving picking table of great length. In addition to this machinery there are in the factory 12 cyclone pulverizers, a number of fan and exhaust blowers, revolving screens of all kinds, shaker screens and jiggers, all driven from the shafting. The main driving shaft is 5 in. in diameter. The whole plant is driven by an engine of 500 horse-power, which is placed in a separate house at one side of the main building with a battery of four large boilers which are of sufficient capacity to furnish more power if needed. The engine stands on a granite foundation and the smoke from the boilers will be carried off by a stack over 100 ft. high. To furnish water supply a pumping station has been placed on a creek near by, the water being pumped into a tank set in the sand and made of heavy timber. The company has established an office at Danville, in charge of Mr. B. Marcuse, who is general manager in charge of all the work at the mines. In the mine also the company is making many improvements with the object of taking out mineral on a large scale. The whole plant is the largest ever erected in the Province of Quebec. Part of the machinery was furnished by Montreal houses and part of it from New York.

Mr. Feodor Boas, of St. Hyacinthe, one of the principals of the Danville company is now in England, and is reported to have completed a large contract for fibre and asbestos. A rumour is also current that he has been successful in securing English capital for the enterprise.

At the mine and factory at Danville about 250 persons are employed and a good output of first class fibre and asbestic is being maintained. The management also contemplate the construction of a line of railway from the mines to Danville Station as the business here has grown so large that the old methods of teaming have become utterly inadequate.

The Glasgow & Montreal Asbestos Company has recently equipped its works at Black Lake with a new Corliss engine 36 in. x 14 in., new tubular boiler 100 H.P., together with new cyclone pulverizer, screen, fan, &c. Work is being carried on under the superintendence of Mr. Jas. Costigan, assisted by Mr. A. M. Evans.

At the American Asbestos Co.'s pits at Black Lake, Mr. L. A. Klein has had a force of fifty men at work during the summer. The output will be about 600 tons at the outside, the bulk of the mineral being fibreised.

The United Asbestos Co., under Mr. John Penhale's management, has been doing some work on its asbestos property at Broughton, but at last report the pits had been closed for the season. This company did no work this year on its Black Lake property.

The Non-Magnetic Co has a force of fifty persons employed at its property at Pointe-au-Chêne, and the output is reported to be satisfactory.

The C. I. F. Co. furnace at Radnor is in blast and running full time.

There has been a good deal of activity in the production of chromite and the output for the year should not be far short of from 4,000 to 5,000 tons. A concentrating plant at Black Lake is, however, a necessity. If the grade could be raised by this means, the output would be doubled and the business rendered much more profitable than it is at present.

Chromic iron is reported as occurring on Lot 26, Range VII., Bolton, and assays have shown the deposit to be sufficiently rich in chromic oxide for shipment. Loose pieces have also been picked up on the west side of Memphremagog Lake, where the serpentines are particularly developed, which have shown a large percentage of chromic oxide. There is, therefore, a strong probability that workable deposits of chromic iron will some day be found in some portion of this serpentine belt.

The slate industry of New Rockland is being pushed with the usual vigor, a valuable new bench of slates being reported from the eastern side of the quarry, so that the work will be extended at the surface instead of sinking to a greater depth.

The slate quarry and works at Danville, are at present closed pending the disposal of a large quantity of merchantable material on hand.

Large areas of excellent peat occur in several parts of this Province and some of these have been extensively worked. The largest and most easily accessible deposits are probably those on the line of the C.P.R. at Ste. Brigide, between St. Johns and Farnham, and in the vicinity of the St. Lawrence, near Valleyfield. The works at Ste. Brigide and at Port Lewis, in Huntingdon, have been closed for some years, but new processes of manufacturing compressed peat may cause these deposits to be again utilized at no distant day. The upper portion of these bogs should furnish an unlimited supply of material for the manufacture of moss litter, now rapidly coming into use, and for which there is a very considerable demand.

Dr. R. W. Ellis, of the Geological Survey, has issued his report on a portion of the Province of Quebec, containing the result of his observations made chiefly in the years 1889-90, but which, on account of unavoidable delays in completing the maps (South-west Sheet of the Eastern Townships), could not be published earlier. Dr. Frank Adams, in this volume, contributes a valuable chapter on the Laurentian north of the St. Lawrence River.

There is nothing new to report from the mica mines. 30 men are employed at the Blackburn, Lewis McLaurin works two pits at Templeton and has added a boiler-house, boarding-house and stables to his buildings. Wallingford Bros. have constructed a new engine-house and have a gang of 12 men on their property. The Dominion Mica Cooperate at Wilson's Corners and the Phosphate King mine in Templeton. The Vavasour mine at Cantley, has been reopened, and there is some talk of a resumption of work at the Lake Girard.

A feldspar deposit is being opened up at East Templeton Station.

NEW BRUNSWICK.

Mr. R. G. Leckie, formerly general manager of the Londonderry Iron Company, is engaged in exploiting what promises to be an exceedingly valuable property in the township of Beresford, Gloucester county. Analyses by F. H. Masson, F. C. S., Halifax, show per ton of 2,000 lbs:

Compact sulphides.....	Gold, 2 dwt. 15 grs.	Silver, 15 oz. 18 dwt.
From outside of sulphide vein.....	" 7 dwt. 6 grs.	" 23 oz. 6 dwt.
Sulphides showing more galena.....	" 6 dwt. 13 grs.	" 33 oz. 3 dwt.
Solid pyrrhotite from side of vein...	" 1 dwt. 7 grs.	" 3 dwt.

Analyses by the Orford Copper Co. show per long ton :

ORE—WHERE FROM.	Gold.	Silver.	Copper.	Lead.	Zinc.
	Oz per ton of 2,000 lbs.				
Ore from south side of vein, very compact sulphides, 1 ft. 4 in. wide.....	81.80	89.00	0.55	3.94	7.07
Ore from nearer middle of vein, 1 ft. 1 in. wide, sulphides, showing galena.....	83.14	8112.00	0.10	42.00	4.25
Ore from middle part of vein, mixed sulphides, 1 ft. 11 in. wide.....	84.48	80.45	0.08	trace	9.07
Ore from middle part of vein, mixed sulphides 1 ft. 11 in. wide.....	84.03	847.00	0.10	18.40	5.36
Ore from middle part of vein, 1 ft. 7 in. wide, quartz, galena and other sulphides	82.24	832.48	0.46	10.72	3.92

This property is in the heart of the forest, six miles from the nearest settlement with as yet only a winter lumber road leading to the mining camp. The vein was discovered four years ago by Mr. Robt. Ellis, land surveyor, who afterwards lost his life while exploring for timber and minerals. Some desultory work has been done from time to time, but no regular development work undertaken until last spring, when Mr. R. G. Edwards Leckie, BSc C. E., took in a dozen men. Trial pits and costeans are being opened and camps built for the men. Two shafts have been sunk from which cross-cuts will be driven when sufficient depth has been reached.

Nova Scotia.

The shipments of coal by the General Mining Association to date, are about the same as last year.

Those from the collieries of the Dominion Coal Co., for the nine months ended September, show an increase as follows:—

	1896.	1895.	Increase.
January	44,097	21,077	23,020
February	9,171	1,799	7,372
March	30,813	5,824	24,989
April	111,177	74,138	37,039
May	153,000	113,401	39,599
June	166,000	131,457	34,543
July	142,000	118,000	24,000
August	148,000	107,679	40,321
September	148,000	107,679	40,321
Total	803,753	578,375	230,388

The shipments from Springhill in September were:—

September, 1896.....	25,499
September, 1895.....	26,632
Decrease.....	1,133
No. 1 slope worked 16½ days in September.	
No. 3 slope worked 12½ days in September.	
Total shipments to September 30th, 1896.....	270,592
Total shipments to September 30th, 1895.....	231,594
Increase.....	38,998

We are pleased to learn that Mr. Charles Fergie, M. E., General Manager of the Intercolonial Coal Company's Drummond colliery has fully recovered from his recent accident in the pit.

The first of the series of by-product coke-oven plants which it is proposed to build on the seaboard will shortly be in operation at Halifax, N. S., where the company is organized under the name of the People's Heat and Light Company. The ovens are of the Otto-Hoffman type, and the company has arranged to furnish both fuel and illuminating gas to the city of Halifax, in addition to manufacturing coke and saving the ammonia sulphate and other by-products. At this plant, of course, Cape Breton coal will be used. It is announced also that plans are being prepared for the larger plant which the same parties, under the organization of the Massachusetts Pipe Line Company, purpose building near Boston; but the work will not be begun until some experience is had at Halifax. At Boston it is the intention to use also Cape Breton coal, from the Dominion Coal Company's mines.

The Londonderry Iron Company, of Londonderry, has completed the first contract of turned and bored pipe for waterworks ever undertaken in America. The contract was for Moncton, N.B., and another is in process of completion for St. John. While the merits of turned and bored pipe over bell and spigot pipe are still a disputed point, yet this company is enterprising enough to meet and arrange for a competition against Great Britain in this class of work.

The clearcoal furnace of Pictou Charcoal Iron Co., at Ferrona is still idle for want of any large orders for pig, about 500 tons from the last campaign being still on hand. For want of capital and dullness in trade the puddle-mill has been closed down. From a very short run in the Spring 100 tons of charcoal pig were converted into muckbars. Mining on the company's valuable ore-territory is, however, continued vigorously the output for the year ended 1st October, being 12,099 gross tons. The product is mainly sold to the Nova Scotia Steel Company's furnace at Ferrona.

It would be impossible to have any better proof of the slovenly way Nova Scotia has been prospected, than the finding of a new and what looks just now as though it would be one of the most important gold fields within ten miles of the capital of the province. There has been a big rush for areas at Cow Bay and Eastern Passage, and several fresh leads have been discovered. The only mill in the district—a toy 5 stamp mill owned by Thompson & Hill—has been turning out its 50 to 90 ounces per month since its erection, the ore milled in it averaging considerably over an ounce to the ton of rock crushed. The continual rains this autumn have greatly retarded prospecting, the ground being swampy. We hope in our next issue to give a full account of this new district.

• There is a lack of consistency about our local government which is really rather lamentable. Last year a commission was formed to look into the fires at the Foord Pit, Pictou County, and as a landlord it is very proper that the government should look after its property, but why in the name of fortune does the government confine itself to coal. It is an established fact that many of our gold mills are losing a large proportion of refractory gold which may be saved by known methods economically, and we consider that the government as a good landlord should look after its property and insist that this gold should either be saved by the parties leasing the properties or that they be shut down and the present woeful waste stopped. There are monuments all over the province in the shape of old tailing dumps, rich in gold, to show the woeful waste in the past. If the gold all remained in these old dumps it would not be so serious, but in many instances it is being carried down stream and being distributed over large areas, probably never again to be recovered. The general idea in Nova Scotia is, that where enough gold can be saved to pay dividends, what is lost is perfectly immaterial. It is high time that this error should be corrected, and where the owners of areas will not look after their own interests, the strong arm of the law should interfere and compel them to stop such lamentable waste.

We had a call from Mr. Damas Touquoy, who was in town with his monthly brick of gold. Mr. Touquoy informed us that his mine was looking particularly well just now; he grumbled a good deal about the amount of water he has to cope with, and well he might, over eleven inches of rain in the month is running somewhere near a record. As a matter of fact rain has interfered considerably with mining throughout the province and will do a considerable amount of damage to the monthly returns for September.

Mr. George Stuart, of Truro, has been examining some properties in the Lake of the Woods district in the interest of Ottawa capitalists.

Mr. Stuart also made an examination of the Dunbrack property for Mr. J. A. Asquith, *et al.*, who have been prospecting the property under a working bond during the past two months.

We had a call from Mr. Andrews, who has just relinquished the management of the Richardson mine, his other interests in the province taking up to much of his time to allow him to remain there. Mr. Andrews reports the mine looking better than it has done for some time, the ore being better and showing a fair amount of gold. Mr. Andrews is prospecting Dolivers Mountain, in which he is largely interested, and also properties at Laurence Town and Caribou.

Miner T. Foster, *et al.*, have consolidated a large block of areas in the Tangier district; they have for some time past been prospecting for the north dip of the anteclinal and have been rewarded for their diligence. Mr. Foster recently showed us some very fine specimens of heavy nuggetty gold which was taken from the find and it is as handsome a lot of quartz as we have ever seen.

Mr. James A. Fraser, is meeting with considerable success at Goldenville. We notice his bricks are now running over 200 ounces per month which is not bad considering the small milling capacity.

After a period of litigation lasting over a considerable number of years, the Beaver Dam Mines are to be opened up again. The property is a large one consisting of 126 mining areas, and 640 acres of crown land. The mine is equipped with a 10 stamp mill, with Homestake mortars and silvered plates, (there is also an eight stamp mill on the property somewhat out of repair,) engine and boiler of sufficient capacity to run a 40 stamp mill, rotary saw mill, and extra boiler for running steam drills. There are also on the property several dwelling houses, a boarding house, offices, blacksmith's shop, &c. Owing to a series of lawsuits amongst the owners themselves the mine was some short time ago, sold by the sheriff and has since twice changed hands, finally we believe it has got into safe hands, and is now owned by Mr. J. H. Austin and others who mean pushing it for all it is worth. Beaver Dam, like Goldenville is a low grade proposition, and we have always contended that the future staple gold mining industry of this province rests in such propositions. There is no earthly reason why such properties as these should not be run with the same economy and consequently the same profits as the celebrated Alaska Treadwell mine, the belts are as big, the ore is higher grade, and labour and supplies are cheaper. So there is everything in favour of Nova Scotia, but in the past the same economy has not been used, nor has the same percentage of gold been got out of the ore, for in the past nothing but free milling gold has been extracted, and if the same reckless waste were carried on at the Alaska mine, we venture to say it would not live another year. Beaver Dam has in the past been only worked to a very

limited extent, but sufficient has been done to prove that the property has great possibilities. A shaft has been sunk to a depth of 87 feet and cross-cuts driven 65 feet north and 40 feet south, at right angles to the metals. In the north cross-cut 36 veins have been cut, varying from 3 to 5 inches in thickness, while the hanging wall of the belt has not yet been reached, this forms one huge intercalated belt, in which both slate and quartz carry gold. A crushing by the old company of 745 tons yielded \$2,965 in gold, or \$3.98 per ton, in this case the whole belt was crushed. The present owners propose using the 10 stamp mill to crush the belt while the 8 stamp mill which is worked by water power, is to be fitted up and used for crushing surface matter only; which it is considered will pay for drilling. We wish Messrs J. H. Austin & Co., the success which we feel sure can be obtained with strictly economical and practical management.

We hear on going to press that the Lincoln mine at Chester Basin has been attached by the sheriff, at the instigation of Messrs. H. H. Fuller & Co., of Halifax.

An expert (who was recently in the Province backed by a considerable amount of money) while looking for gold, was treated to a quantity of sodium chloride, and one more blow has been added to the black eye Nova Scotia has in foreign markets. It is the intention of the "REVIEW" on the first opportunity to show these people up and we will not stick at publishing names. The selfish greed of a few unprincipled people has done much to ruin one of the most promising gold fields in the Dominion of Canada, and to make capitalists look upon this peninsula as the home of a crowd of greedy sharks. But there are honest men in this province, and a number of healthy properties which will pay handsomely for development.

The recently formed company who are working at Blockhouse, Lunenburg County, are meeting with very favourable results, and considering that they have to haul their ore several miles to get it crushed, the fact that they are paying expenses, looks well for the success of the company when it has its own mill erected.

We have recently had a circular from a *Dartmouth Journal* stating they have started a mining column, and soliciting patronage. In this circular they state that for mining news to be reliable it is necessary for the journalist to have access to the Mines office. If by this they mean that they have access to the inner workings of the Mines office, from which the average journalist is excluded, there is a screw loose somewhere which badly wants adjusting.

Ontario.

An effort is being made to secure capital for the construction of a charcoal-iron furnace at or near Bancroft, of a capacity of 50 tons per day. At last reports the prospects of success seemed quite favorable, although as yet not positively assured.

The Canadian Gold Fields, Ltd., an English syndicate, has a large force of men putting up a new plant at the Delora mine, in Hastings county. It is, we understand, the intention to treat the mispickel ore by the Sulman-Seed bromo-cyanide process.

It is estimated that the value of the gold product from the Lake of the Woods will this year be about \$150,000 against \$50,281 in 1895. A much greater increase will naturally follow next season when the mills of the Foley, Saw Bill Lake, Empress and other mines start regular crushing.

Mr. A. T. Anderson and others are opening up a mica mine at Levant, on the line of the K. & P. Ry.

During the year 1895, 27 wells were drilled for natural gas, of which 19 were producers. These were fairly distributed between the Essex and Welland fields, but the non-producing wells were with one exception in the latter.

The Natural Gas and Oil Company of Ontario grew out of the Ontario Natural Gas Company, which bored the pioneer well near Kingsville in 1888-9, striking gas January 29th of the latter year. The new company is really the old one with a new name, and has for its president Hiram Walker, for its managing director Dr. King, and for its general superintendent S. T. Copus, with head office at Walkerville. The total number of producing wells owned by the company (Nov. 22, 1895), is 14, located in the townships of Gosfield and Mersea, south of the second concession line of both townships. Their depth averages about 1,000 feet, the deepest being about 1,050 and the shallowest 980 feet, varying according to the thickness of the surface drift. The gas producing region as far as proved has a width of two miles from the lake northward, by a length of twelve miles east and west. The total capacity of these wells is computed to be 60,000,000 cubic feet per day of 24 hours, but only a certain number of them are allowed to flow; indeed at this date only six are connected with the pipes, but others will be joined very shortly. Then the intention is to use groups of wells alternately. A pipe line of 8 inches diameter along the track of the Erie Railway was commenced in May, 1894, and on 1st August gas was delivered through it to Walkerville. In September and October of the same year a pipe service was laid down in Windsor, and the total length of line from the field to Windsor is 35 miles. On the 30th November connection was made with Detroit, where the gas is used chiefly for domestic heating and cooking

purposes. In Windsor and Walkerville, where there are over a thousand services, it is used for steam-making in Walker's distillery, in breweries and salt works, and by the Electric Railway Company, the Electric Light Company and the city waterworks, and generally for domestic purposes, but not for lighting. A second pipe line was laid down last year and finished in October. It is a telescope pipe, one-half or a little more of its length being 8 inches and the second section 10 inches in diameter. This has been laid down along the public highway, instead of along the railway track, and is consequently less liable to be jarred and broken by passing trains. It is also shorter than the first line by about five miles. A record is made every half hour of pressure at the field, as well as of temperature and of the force and direction of the wind, and this record is telegraphed in to the head office to be compared with a similar one kept there. From the time that the pipe line was opened it is stated that the rock pressure has been steadily maintained at 410 lb. per square inch.

The Essex Standard Oil Company has bored three wells in the same territory as the Natural Gas and Oil Company, but had not commenced to supply gas for consumption. Mr. Edward Harris of Kingsville, is the manager. The Kingsville Gas Company supplies that village. A well in Leamington is owned by the corporation.

There are many surface wells in Kent and Elgin, especially in the townships of Harwich, Howard, Orford and Aldborough, but the supply of gas serves only for private use. In the north-western part of Aldborough, near the limits of the old Bothwell oil field, there are 25 or 30 of these wells, which supply fuel to the farmers on whose lands they are.

In his review of the oil industry of Ontario the Director of mines writes:—On 30th September of last year, Mr. Noble informs me, the total number of wells in the Petrolea field was 6,787, and in the Oil Springs field 3,176, making a total of 9,963. Four years ago the number was only 5,088, whereof 3,535 were in Petrolea and 1,553 in Oil Springs. In several outlying fields a few wells have been bored during the past ten years, whose output is delivered at Petrolea. On the fourth concession of Euphemia, four miles northeast of Shetland village, about thirty wells have been drilled. Most of these were completed ten years ago, and one on John Fimby's farm yielded 20 to 30 barrels per day for a year; it is now closed, having been flooded by water. On Richard Dobbyn's farm a well yielded 100 barrels per day for a few days only; Mr. Dobbyn was offered \$20,000 for it, which he refused. The present average yield of six producing wells in the locality is only one-half barrel per day. Two wells drilled in 1894 yielded for a short time 20 to 30 barrels per day. Five new wells were in course of being sunk in November last. In the south-western corner of Plympton about a dozen wells exist, the product of which is pumped to Petrolea through pipe lines. In the old Bothwell field the good price of crude has led some enterprising men to undertake boring operations again, although the field has been abandoned for more than thirty years, and a hope is entertained that good flows may be struck at a depth of 1,400 to 1,600 feet. On Pelce island also several test wells have been drilled, and at two of these on the western side of the island oil was struck. The second one is on the farm of John Finlay, and on 9th March oil was reached at a depth of 750 feet, accompanied with gas. When the reservoir was struck the oil spurted out of the well to the height of the derrick, 35 feet, but the flow appears to have been intermittent. Other wells have been bored for oil and gas upon the mainland, near Leamington.

The contract price for drilling wells in the Petrolea field is about \$110, the oil being usually reached at 460 to 465 feet. Forty sets of tools were running last year in the territory, much greater activity having been shown since the price of crude has gone up. One rig, working in day time only, will complete a well in two weeks, and the average number of wells drilled is about 80 per month. About 100 wells are abandoned every year, but this is owing to local obstructions and not to failure of oil, it being found cheaper to drill a new well than to clean out the old one. In the early days of the industry many wells were abandoned which now would be regarded as first class yielders; and as none of these wells were plugged the gas was allowed to escape freely, the result of which has been, in the opinion of some careful observers, a reduction of pressure upon the oil held in the rock and a consequent falling off in the daily production. But there are exceptions. In July, 1873, Mr. W. K. Gibson drilled a well upon a five-acre lot on Durham creek, lot 14, in the tenth concession of Enniskillen, which for a long time pumped 40 to 50 barrels per day, and after a period of two years he was shipping from it 900 barrels per month. In 1890, when Mr. Gibson sold the property, this well was producing 105 barrels per month, and he states that the present yield is 75 barrels per month. The Barnes wells, which occupy 48 acres of lot 9 in the fourteenth concession of Enniskillen, were bored in June, 1893, and began with a yield of 75 barrels per day. In May, 1895, the property was purchased by Mr. John Fraser, and he informs me that the yield of the two wells is now 550 barrels per month. It is Mr. Englehart's belief that if the wells were bored down to reach the Trenton formation, oil would be struck to rival that of the Ohio fields. In 1881, his company sunk one well to a depth of 1,505 feet, but abandoned the work before reaching the Trenton. Salt was struck at 1,087 feet, and the drill went through three or four beds until at 1,380 or 1,390 feet it reached one of pure solid salt, continuous to 1,505 feet without getting through it. Ten years ago it was the custom to hold in stock about 500,000 barrels of crude, for which purpose

underground tanks were constructed 60 feet deep and 30 feet diameter, sunk in an impervious blue clay and lined with a wooden curb. Now the stocks are very light, not exceeding 50,000 barrels.

The Imperial refinery works, of which Mr. Englehart is manager, have a capacity to treat 750,000 barrels per annum. All grades of illuminating and lubricating oils are produced, as well as wax and grease. Improvements are made chiefly in lubricants, which are refined, re-distilled, reduced, filtered and pressed, to turn out various grades. By filtering through charcoal a grade of oil is obtained which is required for dynamo machines and other fine purposes. It has been demonstrated by tests at these works that Canadian oils thoroughly desulphurized give better light and burn longer than the best American. There are always some changes and improvements being made, Mr. Englehart informed me, but thoroughly desulphurized oils have been on the market for two or three years. Candles of all kinds are manufactured from paraffin, colored and white, compound, miners' composite, and many others according to use. Much of the oil product is shipped away in large boiler tanks, but much of it is also put up in barrels, and for this purpose the works require 50,000 or 60,000 barrels a year. Formerly these were made chiefly of oak, but as this timber is now growing scarce elm is being used in its stead and is made oil-tight by giving to it a double coating of glue. A smaller percentage of empties comes back now than was the case in past years, as many are being used as packing cases for the nickel and copper matte shipped from the smelting works at Sudbury.

The National Oil Company was organized two years ago to carry on the business formerly owned by Mr. John Macdonald, but Mr. Macdonald himself is president and manager, as well as the principal stockholder. There is only one well on the premises producing crude, but on Mr. Macdonald's farm two miles north of the works there are fifty wells whose product is delivered by pipe line to the refinery. The company buys 4,000 barrels of crude per week, which is the capacity of the works when running full time. They produce illuminating and lubricating oils of different grades, paraffin wax, benzine, gasoline, etc., besides manufacturing candles and binding twine oil. The latter has got to be free from acids of all kinds, must not evaporate at under 250 °F., and is required to contain 50 per cent. pure paraffin wax. The company claims that it is producing this quality, which is sold in tank car lots in Toronto at 11 cents per imperial gallon. "This oil is as good as if not better than the imported oils," Mr. Macdonald says, "yet at the Central Prison twine works the imported oil is used instead, on the pretence that it is freer from acids which would injure the fibre of the twine. This is not the case, for there is no question that the binding twine oil made at our works is perfectly free from acids." The company is now adopting steel barrels for shipping the products of the refinery, and a lot of 1,000 was in course of being made at the time of my visit to the works.

Fairbank, Rogers & Company was organized in 1892 as a partnership concern. The works are on the 12th line of Enniskillen, on the northern side of Petrolea, and at the terminus of the M. C. R. track. The firm is not directly interested in the production of crude oil excepting to the extent of a few wells on the property. But Mr. Fairbank is the largest producer in the country. He owns about 300 wells in different parts of the oil territory, including those of lot 18 in the second concession of Enniskillen—which is perhaps the best tract in the whole region. The works have a capacity to treat 2,000 barrels per week, and they produce illuminating and lubricating oils, gasoline, naphtha and wax. The illuminating oils are of two grades, water white with a specific gravity of .786, and prime white .802. The lubricating oils are of various grades, among which are cylinder oils of superior quality for the use of railways, that until a year ago were supplied by American manufacturers. The total quantity consumed in the country is about 6,000 barrels per annum. Black oils are also shipped to India as grease for car axles. These oils formerly found a market in the United States, but are now excluded under a tariff which provides for free reciprocal trade; otherwise the duty is doubled. The paraffin wax is largely made up into candles, but it is also used for other purposes. The whole product of this refinery is handled by Samuel Rogers & Co. of Toronto.

The refining works of the Petrolea Oil Company were established in 1872 by Messrs. Cochrane & Williams; but the principal owners now are Messrs. Charles Jenkins and John D. Noble, who are also largely interested in the Petrolea Crude Oil and Tanking Company. The refinery has a capacity of 100,000 barrels of crude a year, and produces gasoline, benzine and the illuminating and lubricating oils. The tar which produces wax is sold to the other refining works. Speaking of the relative merits of American and Canadian oils, Mr. Jenkins said: "The American crude produces a higher percentage of fine than the Canadian. Perhaps also it gives better light, but it burns faster. Our oil requires a higher draft to supply oxygen for the flame, and until recently lamps were not made for Canadian oils. But with a suitable lamp, such as the Excelsior, the Sun Hinge burner and the Climax burner, which give strong draft and high heat, a fine flame is produced. One gallon of Canadian oil will last as long as 1½ gallon of American."

The Crystal Gold mine at Lake Wahnapiatae will put in a ten stamp mill as soon as the ice forms and permits the transportation of the machinery. Dr. A. R. C. Selwyn, C.M.G., late director of the Geological

Survey, recently visited the mine in the interests of the shareholders and is understood to have reported very favorably on the value of the property.

A deposit of copper pyrites is being opened by Detroit people, near Schreiber, on the C. P. R., and two cargoes had been shipped at last report.

The Hamilton Iron Furnace is reported to be turning out a very good grade of pig, the ore being imported from mines on the American side.

Nickel mining at Sudbury, is reported to be more active. The Vivians of Swansea, are re-opening the Murray mine. The Drury mine and furnace are also in operation in addition to the extensive works of the Canadian Copper Company.

At the camp of the Seine River, (Ontario), Mining Company (Ferguson) on locations A.L. 110 and 111, and K 223 a force of 65 men are actively and continuously engaged in sinking and drifting upon their numerous auriferous quartz lodes, including the "Daisy," the "New Find," the "Government Vein" and the South or "Finn Vein." The mining force here are almost exclusively Scandinavians, and apparently their excellent work at this camp is creating a demand for the hardy Norsemen throughout the new mining district generally. Three of the shafts have now attained depths ranging from 55 to 79 feet. Extensive surface work has also been carried out here since the arrival of Mr. Ferguson, who is also the company's consulting engineer. Their new boarding house affords accommodation for over 100 men. Mr. A. B. Whitley, E. M., has entire direction of the works here.

The Nova Mine is situated to the north and east of the Seine River, (Ontario), gold mine (Ferguson), and immediately upon the line surveyed for the Ontario and Rainey River Railway. The Nova is traversed by three gold-bearing quartz lodes upon two of which tests have been made by the owners of a very satisfactory kind. The government registration number of the Nova is "K 383," upon which active mining operations are about to be made.

At the "Foley Camp"—(under Superintendent R. Flaherty) now organized as the "Ontario Gold Mining and Milling Company," over 100 men are employed in mining in the two shafts upon locations A. L. 74 and A. L. 75, and in the construction of their reduction works now under way. This plant is from the well-known firm of Fraser & Chalmers, of Chicago, and includes a battery of 20 stamps. The No. 5 shaft on A. L. 74 is down over 120 feet with drifts north and south from first level. The north or No. 1 shaft, upon A. L. 75 has attained a depth of 220 feet with over 350 feet of drifting from their three adit levels. The vein matter in this shaft (measuring over 3 feet throughout) is left intact. Sinking and drifting here is by Ingersoll drills (3 drills), while two crews of hand drillers are also steadily employed. The geological formation is granite (protogene). The veins have a strike of north 18 degrees west, astronomic, with an almost vertical dip, are most pronounced in character from surface downwards, and invariably (here) cut squarely across the formation. The Ray Group, including K. 198 A. L. 94, 95, 96 and 100, completely encircle the Foley gold claims, and wherever tested show, if possible, richer ores and stronger lodes, and as most of this group has been partially developed with most encouraging results, according to the examinations of Mr. Hamilton Merritt, F.G.S., and other experts, it is possible we shall soon have occasion to chronicle their vigorous development.

The Big Ben—Touching the shores of Bad Vermillion Lake, and immediately behind this group is the latest claim organized as a company. It is traversed by the same series of auriferous veins, the ores of which give a very fine average in free milling gold.

The Bill Wiegand—Is also in the protogene group adjacent to the Ray-Foley claims, and as a matter of fact traversed by the same and another series of rich ore. The "Bill Wiegand" claims include A.L. 103, A.L. 104 and A.L. 105. A very appreciable and most satisfactory amount of work has been carried out here by the owners, and thanks to the skilful and practical manner in which the work is being performed, the examiner, even if not considered quite *au fait* in the matter of "fissures" and other occurrences of veins in this most interesting section, can literally traverse miles of well mineralized quartz lodes, well within the Wiegand limits. These claims are well adapted for economical mining and milling. Many other claims are just now being examined here in the interest of Canadian, American and English capitalists. There is also, we are pleased to observe, a movement on the tapis to remove (to a safe distance), the numerous grog-shops now being established on this hitherto "temperate" range. This is a step in the right direction. The "Public Works Act" should be applied, and at least flagrant violations of the liquor laws of Ontario promptly suppressed.

Indications of oil at Fredericksburg, near Kingston, have led to the installation of a drilling rig on the farm of a Mr. Schell and work is to be commenced forthwith.

Mr. Wm. Smail, B.A., Sc., late of the Londonderry Iron Company, is now at Hay Island, Lake of the Woods, making an examination of this property for a Montreal syndicate.

The gold product of the Lake of the Woods for the month of September is estimated to have amounted to \$22,000.

A new company, with an authorized capital of \$250,000 is being organized in Winnipeg, to acquire and work the gold property on Witch Bay, Lake of the Woods, owned by Mr. J. F. Howard, Winnipeg.

Mr. J. Burley-Smith, engineer in charge of the Queen Bee mine, Lake of the Woods, exhibits a diamond drill core 5 ft. 6 in. in length and 1 1/2 inches in diameter.

The Gold Hill mine has, we understand, been reopened, a force of 25 men being recently put to work.

The property and plant of the Ophir Gold Mining Company of Chicago in the township of Galbraith, was sold by auction in Toronto on 17th inst. The property and plant, which includes a 20 stamp mill, was purchased by A. R. Creelman for Peter McCarthy for the sum of \$52,000.

The Ontario Graphite Company is putting in a treatment plant for refining graphite at their new mill on Victoria Island, Ottawa. The plant, which has been furnished by Fried Krupp, of Grusonwerk, Germany, will be in working order about 1st December. Five hundred tons of crude ore from the Black Donald mine is stored here ready for treatment. Mr. Fred Cirkel, M. E., has charge of construction.

British Columbia.

At the mine of the Cinnabar Mining Co. at Kamloops Lake, development has been very satisfactory of late, and the directors have about completed plans for the erection of a furnace of a capacity of 24 tons per day. The plant is to be erected immediately.

The coal disposals for September were:—

	Tons.
New Vancouver Coal Mining and Land Co.....	14,206
Wellington Colliery Co.....	24,850
Union Colliery Co.....	9,565
Total.....	48,621

The War Eagle Gold Mining Company, on Oct. 6th, declared a dividend of \$30,000, payable on the 15th. This brings the total dividends paid, up to \$187,500.

The Reco Mining Company and the Noble Five Consolidated Mining Company at Sandon and Cody, have let contracts to Robert J. Cory, general western agent of the Edward P. Allis Company of Milwaukee. Each contract calls for a complete concentrator plant of a capacity of 120 tons, to be shipped at once. This plant with the Slocan Star will give this vicinity a milling capacity of about 400 tons of ore daily.

Superintendent Long, of the Josie, has begun to stop the big ore chute opened in the east tunnel and the company has contracted to ship regularly to the Hall Mines smelter at Nelson. Delivery of ore under their contract has begun. Some conception may be had of the amount of ore in sight where stoping is now in progress, when it is said the chute is opened for about 50 feet in length already and that is has an average width of 7 feet. It is 150 feet from the tunnel to the surface. Therefore a body of ore 50 feet long, 150 feet high and 7 feet thick may be counted on. This means 7,000 tons. The average value of the ore, as shown by careful tests made for two weeks or more, is about \$80 per ton. The amount now blocked out is therefore probably worth \$500,000, or nearly dollar for dollar of the entire capitalization of the company. There are about 4 feet of clean ore in the face of the tunnel at the present time, and there is no telling where this exceedingly rich chute will end. It is nearly 200 feet from the face of the east tunnel to the face of the main tunnel. The face of the main tunnel is all in ore of good grade, though a good deal of sorting is necessary. The Josie must now rank right along with the Le Roi and War Eagle.

The Wellington mine, the property of the K. & C. P. & M. Co., Ltd., of Ottawa, has commenced ore shipping, 3 tons per day, of an average value of \$100 to ton have been taken out since the end of September. About \$20,000 have been expended in development work this summer, chiefly in extending tunnels, upraise from 225 ft. level to surface, and on wagon road. Mr. John McConnell, of Helena, is superintendent, and Mr. W. R. Askwith, B.A., Sc., mining engineer for the company.

A cable from London this month announced that Hall Mines shares were on the decline in London, being quoted at \$8.15. There is no local reason for the decline unless it be that the close down for repairs is misunderstood. There is a large force of men working around the smelter on the improvements. The bricklayers are at work on the big stack, and on the foundations for the reverberatory furnace, and the necessary excavation is being done to connect the flue chambers with the stack. At the mine

the work of installing the machinery is going ahead steadily. It is not likely that the furnace will be blown-in until the tramway has laid in an ore reserve of 1,000 tons.

The Mand hydraulic mine, Quesnelle, has been sold to Col. Fishback and conferees of New York, and will be operated next season in conjunction with the Fishback claim. The new syndicate has been capitalized at \$5,000,000.

Never in the history of Cariboo and Lillooet has the outlook been better in a general way than at the present time. It now seems a certainty that the beginning of next season there will be more work under way in the various camps than could reasonably have been expected a short time ago. Capitalists have been visiting the different sections and reports on the whole have been more than favorable. Quesnelle Forks, the Horsefly, Barkerville, Stanley, Quesnelle and other parts will be lively next season. The projects undertaken will cost much money to open up and make paying mines, but when properly put in shape, will be dividend payers for an almost unlimited time. Quartz mining will develop more slowly, but is as certain to come to the front in Cariboo and Lillooet as in any section of British Columbia.

The Le Roi Mining Company declared a 5-cent dividend at their last meeting held in Spokane this month. It was payable the next day and amounted to \$25,000. This makes a total of \$225,000 distributed to date. This places the Le Roi second among the producers of West Kootenay. The Slocan Star is first. The dividend would have been paid sooner but for the fact that a large amount of new machinery has been installed, which has involved the outlay of about \$75,000, and the surplus earnings have gone to pay this.

The Hall Mines smelter has been running along smoothly for the past week on Silver King and Josie ores. During the first six days 738 tons of ore were run through the furnace producing 50 1/2 tons of matte. The big brick chimney is now up 132 feet, and it is expected that the remaining 35 or 40 feet will be finished in 8 or 10 days. This chimney will probably be the highest in Canada, the top of it being 200 feet above the furnace blower. The stack of the reverberatory furnace has been finished, and workmen are now preparing the foundation for the calcine furnace or roaster. When these improvements are perfected work will be commenced on the blast furnace, the order for the castings having been placed.

The Idaho silver mine, Slocan, is reported to have paid this month a dividend of \$18,000, making about \$50,000 in all. It is being worked through the Almo ground, and is shipping about 35 tons of 70 ounce ore every day to the concentrator.

The London correspondent of the *Engineering and Mining Journal*, writes: "The signs of a boom in British Columbia are getting stronger. New companies are being registered every day, and in a most cases the cloven hoof is clearly visible to one who knows the promotion system as carried on in London. Here is some advice to the owners of mines and claims in British Columbia. Never sell a mine or a prospect to a London company for anything else but cash, and never deal with a London promoter unless you know his record. By following these rules, probably nine-tenths of the business would be choked off at once, a tantalising state of affairs for the owner of the prospect, but such a will be better in the end, for he will at least still own his property, whereas, if he deals in any other way he will soon find that he has neither his name or the cash.

The Mountain Chief one of the best producers in the Slocan, will again commence shipping ore this week to Everett. The Chief does not owe its owners anything as it has produced more than \$100,000 worth of the white metal since George Hughes first commenced to work it. From three to four hundred tons of ore will be shipped this fall. If, after the United States election in November, matters are not favorable the mine will be shut down for a time. If the price of silver continues at about the same price it is now, a concentrator will be put up, about a mile from New Denver, new and improved machinery put in the mine, and preparations made to handle all the ore that can be taken out.—*Ledge*.

W. R. Rust, superintendent of the Tacoma Smelter Co., has the following to say about the coming smelter and refining works at Vancouver, of which he will be manager:

"We expect to be at work on the construction of the new plant within thirty days. It will have a capacity of about 400 tons of ore per day, or four times the present capacity of the Tacoma smelter, and will smelt and refine copper, lead, gold, silver and other metals. Four stacks will be erected and the works will run day and night, employing 250 men steadily. I expect the plant will start up about six months hence.

"The company which will erect and operate the works was organized, during my late visit east, after conferences held at Montreal and New York with capitalists. The head of the syndicate is C. D. Simpson, of Scranton, Pa., one of the most extensive miners in that State, and reputed to be worth \$3,000,000. Other members of the syndicate, I am not at liberty to name. Neither can I state the names of those whom I will meet at Vancouver to-morrow. The capital stock of the syndicate is one million dollars, and every cent of it is now paid up. The smelting and mining company will be incorporated under the laws of British Columbia.

"The ore for the new smelter will come from mines in the Rossland and Slocan mining districts, in British Columbia."

BOUNDARY CREEK.

The 50-foot contract on the Old Ironsides shaft was completed Sept. 28th. S. A. Rigg of the Old Ironsides Mining Co., has since been in to examine the work done. It is understood that a new contract has been let to the same party for the continuation of the shaft.

The Montreal and British Columbia Prospecting and Promoting Co. appear to be thoroughly well satisfied with the Gold Drop, Greenwood Camp. They are taking up the bond, the final payment to be made November 1st. Work has been temporarily suspended pending the completion of arrangements for the regular working of the property. Mr. Turner has gone out to Vancouver.

On the Stenwinder work has been progressing steadily since early in September, under the superintendence of W. T. Smith. A new shaft has been started between shafts Nos. 1 and 2, and is now down 40 feet. The average gold and copper value throughout is entirely satisfactory. Mr. Farrell, of the Parrott Smelting Co., is expected in this month.

The Skylark is working a small force and will continue for the winter.

On the Copper, work has been suspended pending an examination by the American Exploration Company's chief engineer, who will be in in a few days.

A tunnel is being driven to tap the ledge on the Ulster lode. It is now in 35 feet. Two shafts are working.

Numerous locations are still being made along Boundary Creek, seven miles above Greenwood. Although the grade is on the surface very low, many of them are true veins of pyrrhotite and copper pyrites, and the locators are not altogether unwarranted in hoping great things.

From all accounts it would seem that one of the most promising strikes in the district for the season is the "Rambler," located in July about ten miles north east of Greenwood, on the trail to Pass Creek. The writer has not had an opportunity of examining it, but it is said to be 20 feet wide on the surface and to average \$15 in gold. The ore is pyrrhotite and copper pyrites. The Rambler Mining Co. capital stock, \$1,000,000, has been formed to work the property. Development will continue throughout the winter.

It would be interesting to learn where the ore-dump of 1,000 tons is in Copper Camp awaiting shipment and averaging \$27 per ton, as mentioned in the prospectus of the *Coolgardie Mining Co.*—? ? ?

A really very fine strike has been made by Jas. Dale on the west fork of Kettle river, about forty miles above Midway. It is a quartz ledge claimed to be five feet in width. From assays made it would seem to average \$20 in gold. It is mineralized with iron and copper pyrites, galena and blende. The claim is called the "Carmi."

It is understood that the reason the Olive Mining Co. formed to work the Volcanic and other claims on Brown's Mt., was stocked for such an extreme figure as \$20,000,000 was that the original owner had too firm a belief in the great value of his properties to go in with a company of any less magnificent and exalted proportions. It is to be hoped the belief is proved to be well founded.

NEW COMPANIES.

The Vancouver and British Columbia General Exploration Co., Ltd., seeks incorporation under the Foreign Companies Act, for the purpose of exploring and working mines and mineral lands in British Columbia and elsewhere. Capital, £25,000, divided into 25,000 shares of a value of £1 each. Head office, 20 Treadneedle Street, London, England.

The Beaver Quartz Mining Co., Ltd., seeks incorporation under the Companies Act, 1890, with the object of mining in the province of British Columbia. Capital, \$1,000,000, divided into 1,000,000 shares of a value of \$1 each. Directors, Jas. F. Cook, Vancouver; Jas. A. McNair, Vancouver; Robt. Hamilton, Vancouver; chief place of business Vancouver, B.C.

The Portland Gold Mining Co., seeks incorporation under the Foreign Companies Act, with the following object: To develop, operate and work the Portland mining claim, situated on or about Champion Creek, British Columbia, and to carry on mining operations in the Province of British Columbia and elsewhere in the Dominion of Canada. Capital, \$600,000, divided into 600,000 shares of a value of \$1 each. Chief place of business, Spokane, Wash.

The Kootenay and Slocan Prospecting and Promoting Co., Ltd., seek incorporation for the following objects: To purchase, acquire and take over the business or undertaking and the goodwill of the Rosland Mining Syndicate, and to carry on mining operations elsewhere in the Province of British Columbia and in the Dominion of Canada. Capital, \$100,000, divided into four thousand shares of a value of \$25 each. Directors, C. A. Holland, Victoria; John Rayner, and O. P. Skrine, of Vancouver, B.C. Chief place of business, Vancouver, B.C.

The Yale Gold-Copper Mining Co., Ltd., seeks incorporation with the following objects: To purchase the "Yale" mineral claims, situated in the Trail Creek mining division, in the West Kootenay district, B.C., and any other mineral claims in the said camp, or elsewhere in the Province of British Columbia. Capital, \$1,000,000, divided into 1,000,000 shares of a value of \$1 each. Directors, T. C. Gray, Rosland; George Talbot, Rosland; Eli Terzick, Rosland. Chief place of business, Rosland, B.C.

The Hill Top Mining Co., seeks incorporation under the Foreign Companies Act with the following objects: To purchase, hold, own, work and operate mines of gold, silver, copper, lead and other metals in the Province of British Columbia, and to carry on mining operations in the Province of British Columbia and the United States. Capital, \$1,000,000 divided into a million shares of a value of \$1 each. Chief place of business Spokane.

London Hill Development and Mining Co., Ltd., seeks incorporation with the following object: To purchase or otherwise acquire, and to develop, work and mine, and turn into account the London group of mineral claims, being the four mineral claims adjoining one another, known as the "London," the "Third of July," the "Pompeii" and the "Round-up," situated in the Ainsworth and Slocan mining divisions of West Kootenay, and to mine elsewhere in the Province of British Columbia and the Dominion of Canada. Capital, \$150,000 divided into 600,000 shares of a value of twenty-five cents each (25c.) Chief place of business Kaslo, West Kootenay, B.C. Directors, O. T. Stone, H. Byers and Anson Wheeler, all of the city of Kaslo, B.C.



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Works and Head Office: PETROLIA, ONT.

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Late Director of the Geological Survey of Canada and of the Geological Survey of Victoria, Australia.

Mines and mineral properties examined and reported on.

Fifty years experience in Britain, Australia and Canada.

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WHITE MICA MINE.—Working manager wanted for Central Ontario. Thoroughly experienced. Address, stating same, and salary expected: Anderson, 75 Adelaide st., east, Toronto

WHITE MICA MINE.—Large deposit, first quality, large size. A half share for sale. Three thousand required. For particulars apply to Samuel Smoke, York Chambers, Toronto.

WANTED PARTNER.—Reliable party with one thousand dollars. Must be a live man; bred to broking business, to take the office duties. For particulars address: Samuel Smoke, York Chambers, Toronto.

MINE MANAGER WANTS ENGAGEMENT.—Mine manager with many years experience in coal and iron and in the mining of Canadian asbestos. References first-class. M. Office of the CANADIAN MINING REVIEW, Ottawa.

ASSAYER AND CHEMIST.—Graduate of McGill, desires employment in works, foundry or office. Has had several years' experience in an iron works laboratory. Address 'S', CANADIAN MINING REVIEW, Ottawa

MINE FOREMAN.—A Scotchman of many years' experience in Canadian nickel, phosphate and asbestos mines wants situation. Apply, 'D', CANADIAN MINING REVIEW, Ottawa.



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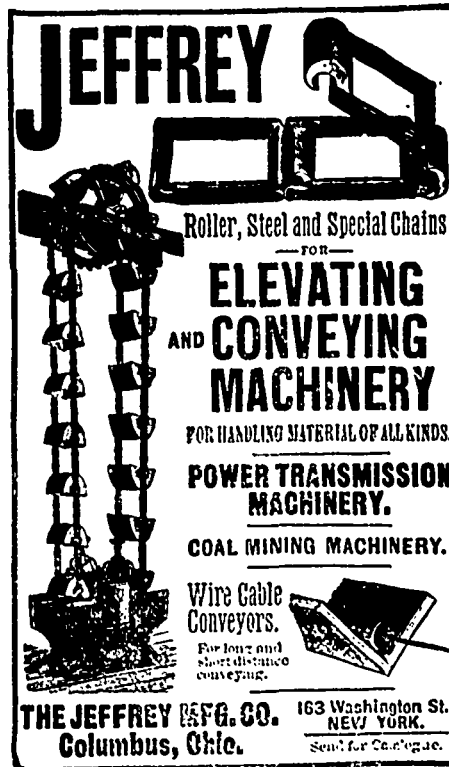
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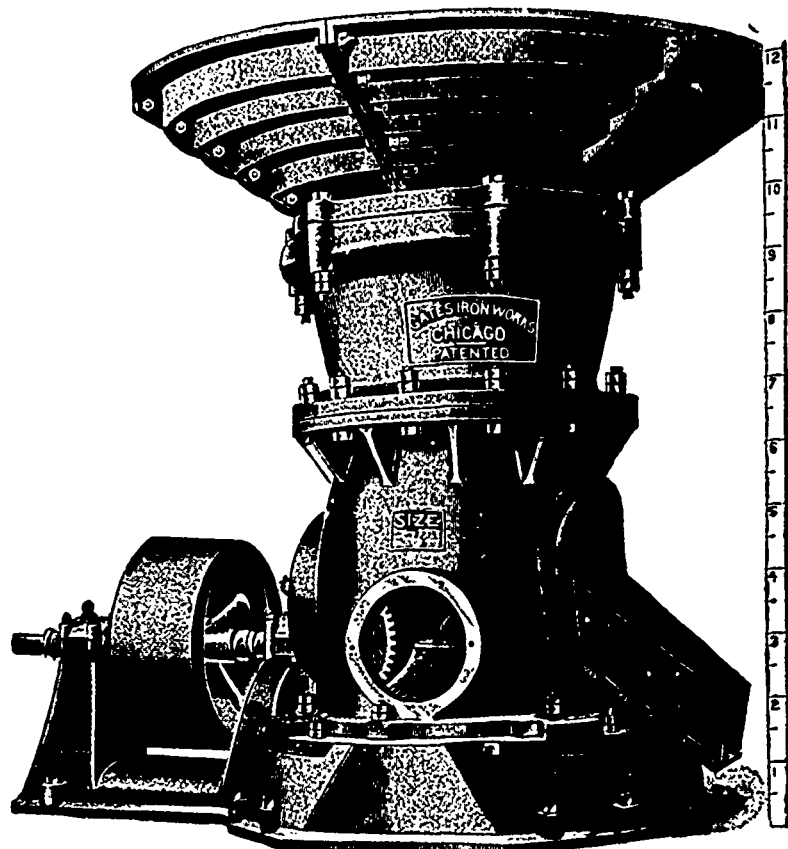


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CHICAGO, U.S.A.

THE MIDWAY CO. LTD.

Organized October 9th, 1896.—Incorporated under the Laws of the Dominion of Canada.

CAPITAL, \$60,000, IN 1200 SHARES OF \$50 EACH,

of which 600 shares are issued to the Vendors as fully paid up shares, as part of the consideration for the property to be transferred by them to the Company, and the remaining 600 shares are held by the Company to be issued as required for working capital.

300 OF THESE SHARES ARE NOW OFFERED FOR SUBSCRIPTION AT PAR.

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PRESIDENT: CAPT. ROBERT C. ADAMS, MONTREAL,
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 ALEXANDER PATERSON, ESQ., WM. STRACHAN, ESQ.,
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SECRETARY-TREASURER.

GEORGE DAWSON.

OFFICES.

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PROSPECTUS.

THIS Company is formed for the purpose of acquiring and developing Lands in the Dominion of Canada.

The immediate object of the Company is to purchase one thousand acres of land in the Kettle River Mining Division of Yale District, British Columbia, known as the Boundary Creek District. The property consists of:—

Eholt's Ranch, containing	- - -	337 acres.
Murray's Ranch,	- - -	343 "
Eholt's Meadow	- - -	320 "

Total, 1000 acres.

and includes the townsite of **MIDWAY.**

This land is highly valuable for agricultural purposes, but is chiefly important as affording the best location for a townsite in the noted Boundary Creek District, a region which contains the largest ore-bodies known in British Columbia, and which is being rapidly developed for the production of gold, silver, copper and lead.

Eholt's and Murray's Ranches, comprise 680 acres, in one block, at the junction of Kettle River and Boundary Creek, the southern boundary of the property being the International line between British Columbia and the State of Washington

The valley which they occupy constitutes the only available pass for travel east and west near the boundary line, and all the traffic between the Okanagan country and the Columbia river passes through it. Canadian and U. S. railroads are projected to it and it will soon be the junction of the railway systems. The new main line of the Canadian Pacific Railway via Crow's Nest Pass is expected to be located there, a charter has been granted to the Columbia River and Western Railroad to pass through both Eholt's Meadow and Midway, and it is the objective point of the Spokane and Northern Railroad.

The town of Midway has been started on Eholt's Ranch, and has been accepted by the government as the central point of Kettle River District. The Registry Office and Jail have been erected there; Court is held in the town; School, Post office and stores have been established, and the Mining Recorder and Government agent has his official residence there. A newspaper, "The Advance" is published in the town.

It is down hill from all the Boundary mines to Midway from the east, and coal lands adjoin the town on the west: There is also a good supply of limestone, so that the natural facilities all point to Midway as the future sight for the erection of smelters. This opinion has been given, after careful examination of the country, by Samuel S. Fowler, M. E., of Chicago, who says, "The focal point of the district is certainly Midway or its vicinity." The German Consul from Tacoma was at Midway, August 27, making a report for the German Government on the entire Boundary district. He says "Midway is the best smelting point in the district." This fact alone assures its fortunes. Midway is

also stated by the best authorities to be the natural business centre of the country.

The Company acquires with the land several buildings, including a large house designed for a hotel, a printing office, and a store building.

By the purchase of Murray's Ranch, a practical monopoly of the valley is obtained and opportunity is afforded for the sale of small farms as well as building lots. The title of these lands includes the right to 1000 inches of water from Boundary Creek, and there is well water under all the land at a depth of less than 25 feet. A small outlay will provide irrigation and make the land very valuable for cultivation.

Eholt's Meadow is a valley of great fertility, 12 miles east of Midway, in a mountain region where agricultural land is scarce. It occupies a pass through which the railway is projected. It has a sure value for farming and may become the site of a small mining town as the country develops.

Investment in western town sites often yields great profit. Land that is purchased for a few dollars an acre is often sold for thousands. Towns spring up in a year to a population of 3000 or 4000 inhabitants, and building lots advance in value in that time to \$1000 or \$2000 each. The past year has seen this fact illustrated in the town of Rossland, sixty miles east of Midway, which in one year's time gained a population of 3000, and its business lots are now reported to be selling for \$1000 to \$5000 each. The town of Kaslo had a similar experience and in one year made a fortune for its promoters. The mining excitement is now spreading westward in the direction of Midway, and well informed men say that its vicinity, the Boundary Creek district, will in the coming year experience the greatest "boom" that has ever occurred in British Columbia.

The Company acquires these properties for \$53,000, to be paid in the following manner:

In cash to pay bond on Murray's Ranch,	\$ 8,000
From first returns of land sales,	15,000
In fully paid shares of the Company,	30,000

One half of the capital stock, viz., \$30,000, is reserved for working capital, and a limited number of these shares are now issued to provide for the cash payment of \$8000 for Murray's Ranch, water works, improvement of roads, etc.

Investment in the Midway Company is safe, because of its low capitalization and from the fact that the return of money is not dependent upon trading profits, as, after the obligation of \$15,000 is paid, the shareholders receive the whole proceeds of sales. It may be confidently expected that the whole capital will be repaid promptly and that eventually a large profit will be obtained.

Full information may be obtained at the offices of the Company, 41 St. Francois Xavier Street, from ROBERT C. ADAMS, TRUSTEE.

... PROSPECTUS OF ...

The Red Point Gold Mining Co.

(LIMITED LIABILITY.)

OF ROSSLAND, BRITISH COLUMBIA.

TRUSTEES: J. K. CLARK. P. G. NASH. J. FREDERICK RITCHIE, D. L. S.

PROVISIONAL DIRECTORS.

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HECTOR McRAE, OTTAWA. WM. McNALLY, MONTREAL. HAROLD KENNEDY, QUEBEC.

INCORPORATION.

The Red Point Gold Mining Company, Ltd. is incorporated under the laws of British Columbia, Act of 1890 and amendments thereto, for the purpose of acquiring and developing the "Red Point Mineral Claim," situated on Lookout Mountain, between Rossland and Trail Creek, in Kootenay Mining District, British Columbia.

CAPITAL STOCK, \$1,000,000.

The Capital Stock of \$1,000,000.00, is divided into one million shares of the par value of \$1 each, of which 300,000 shares have been donated for development purposes.

The Stock is issued fully paid up and unassessable, and absolutely free from liability.

TITLE.

The property has been paid for, surveys made, and an application made for Crown Grant.

POSITION AND SIZE.

The "Red Point" claim was the first location made on Lookout Mountain, and lies between "St. Charles," "Debs," and "Sovereign," on the one side, the "Imperial," "K. of L.," "Wolverine," "Occidental," and "St. Croix" on the other.

The location was made by Benjamin Perkins, on June 6th, 1893, and assessment work recorded June 1894, June 1895, and May 16th, 1896.

Since taking option on the property about \$2,500 worth of development work has been done, and a diamond drill plant put to work the latter part of August, in order to test the ledges at depth.

One cross-cut boring was put in 150 feet, which showed mineral at 128 and 148 feet from the side of the mountain, and at a depth of about 100 feet from the surface.

Tenders for a tunnel 300 feet long have been advertised, and a contract for same will shortly be made. The estimated cost of this tunnel is \$3,000.

The size of the property is 1,500 by 1,500 feet the full size claimed.

The citizens of Trail City have contributed a fund for the building of a wagon road from the town up Lookout Mountain to connect with the mines

REPORTS ON THE VALUE OF THE PROPERTY.

ROSSLAND, B. C., JUNE 27TH, 1896.

HECTOR McRAE, Esq.

DEAR SIR:—I have made a careful examination of the Red Point Mineral Claim, situated on Lookout Mountain, and beg to submit the following report:—

The Red Point is located on the west side of Lookout Mountain near the summit, distant about four and one-half miles east of the town of Rossland, and one and one-half miles south-west of the town of Trail and Trail Smelting Works. The ore deposits occur in the form of three parallel veins, as shown by the outcrop, which is large and well defined, and can be traced nearly the entire length of claim, the trend or strike being in an easterly and westerly direction. The width of the veins are of unusual thickness, the croppings in several places being over 50 feet in width.

The vein matter or matrix consists of large masses of oxidized iron, interspersed with streaks of Arsenical Iron on the surface, carrying small gold values with a small percentage of copper. At a depth of a few feet, as shown by the limited amount of development work done, the oxidized ore changes to a sulphide, carrying Iron Pyrites, Arsenical Iron, Copper Sulphides, and Chalcopyrites of Copper, and greater values in

both gold and copper. These features are characteristic of the principal mines of the district where pay values are not expected at the surface. The development work consists of several open cuts from five to ten feet in depth, and in each of the openings a fair showing of ore is exposed.

The Red Point is well situated for inexpensive development; the steepness of the mountain—about 450 feet—and strike of veins makes it a tunnel proposition. The mountain rises abruptly from a bench near west line of claim and tunnels can be driven on the veins from the surface, thus avoiding the expense of dead work through country rock.

An ample supply of water for steam purposes can be obtained from never-failing springs on the claim near the north boundary line. There is also sufficient timber for mining purposes on the claim, for several years.

I have examined the records and find the title to the Red Point to be perfect; and, as shown by abstract in your possession, the claim is full size being 1,500 feet square.

In conclusion, I will say, that I believe you have a very promising property, and shall expect good results from a limited expenditure in development work.

Respectfully yours,

(Sgd.) J. K. CLARK.

(Extracts from "Rossland Miner," July 31st, 1896.)

LOOKOUT MOUNTAIN.

Several most promising properties being opened up there Lookout Mountain, a few miles south-west of Rossland, and overlooking the town of Trail, the Trail Smelter and the Columbia River, is just now the scene of remarkable activity, the central point of interest being the "Sovereign" some account of which appeared in the *Miner* of last week. Lookout Mountain, like everything else in the vicinity of Rossland, was staked long ago, and some work was done there on the "Oriental" and "Debs." The "Sovereign" lies on the east side of the mountain well up towards the summit, and a wire tramway a little over a mile long could deliver ore right into the bunkers of the Trail Smelter.

About the "Sovereign" are grouped a number of claims which have more or less promise, among them being the "Sooner," (Imperial) and "Boyce" under bond to the "Imperial Company" of this place, the "Debs," and "Red Point," belonging to the Kootenay & Columbia Company of Ottawa, Hector McRae, Manager.

The "Oriental," "Wolverine," "Vernon," "St. Croix," "M. P." and "Joker." Work is being done on the "Debs," "Sooner," "Red Point," and "Sovereign." The greatest development has been on the "Sovereign," and here is the most encouraging showing on the mountain.

A representative of the *Miner* went down to see the "Sovereign" Wednesday. The working shaft is down a little over 50 feet. The ledge which out-crops with the usual iron cap, has a south-west and north-east course, and the dip is very slight. Very good quality of ore was encountered near the surface, and there has been more or less of it in the shaft ever since. The surface assay ran a dollar or two in gold and at a depth of ten feet the gold values had increased to \$6 and \$8. Early last week a sample assay went \$16.40 in gold, with 3 per cent. copper, while an assay made Tuesday made \$50 in gold. An assay made Wednesday went \$18. These are very satisfactory. The finest ore yet seen in the mine was taken out Wednesday and assayed \$28. It was a fine grained pyrrhotite, with splashes of quartz all through it, and bits of copper grouped about the quartz, the whole having a bright steel gray color. It looks very much like some of the ore taken from the Kootenay mine and tells its own tale of good birth.

It looks a good deal like another "Crown Point," and its further development will be watched with great interest.

On the "Red Point," between which and the "Sovereign" there are two claims, they now have ten inches of solid ore. Mr. McRae went down Wednesday and arranged to put a Diamond Drill on the property immediately. He will make borings at a distance of 125 to 250 feet from the ledges on the dip side, and expects to cut the vein at a depth of one to two hundred feet. Mr. McRae thinks it a fine ground for a Diamond Drill.

This Company has been formed for the purpose of opening up and developing the Red Point mining claim.

The owners having tested the property by considerable surface work, opening up and exploring the ledges, and with borings with their Diamond Drill, and fully satisfied that the Red Point will make a shipping mine when opened up by a tunnel to cross-cut the four ledges 200 feet from the surface, now offer one-half the Treasury Stock, viz:—150,000 shares—to the public. The balance of the Treasury Stock will be placed in the market later on at an advanced price.

Shares are now offered at 10 cents in blocks of not less than 500.—Subscription Books are now open at the Company's office,

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2. *Four Years' Courses for a Degree in*

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- (B) Chemistry and Mineralogy (B. Sc.)
- (C) Mineralogy and Géology (B. Sc.)

3. *Post-Graduate Courses for the Degree of*

Doctor of Science (D.Sc.)

For further information see the calendar of Queen's University for 1894-95, p. 117.

4. *Prospector's Course.*

The School offers to Mine Foremen, Assayers, Prospectors and Mining Men generally, Special Courses of Instruction beginning January 8th, 1896, and continuing eight weeks.

5. *Extramural Classes for Prospectors and Mining Men.*

Lecturers will be sent to Mining Centres to conduct Classes in Elementary Chemistry, Mineralogy and Geology as applied to the discovery and winning of valuable minerals.

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

The BRUCE CARRUTHERS SCHOLARSHIP (value \$200 per annum) will be awarded in May. Its object is to aid one who has had some experience in amalgamating, etc., in acquiring a good education in Mining Engineering. The conditions of the award will be made known on application to the Director or the Bursar.

FOR CALENDAR OF THE SCHOOL AND FURTHER INFORMATION APPLY TO

WM. MASON, Bursar,
SCHOOL OF MINING, - KINGSTON, ONTARIO.



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

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

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

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

MINES OTHER THAN GOLD AND SILVER.

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

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

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

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

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

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

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

THE HON. C. E. CHURCH,

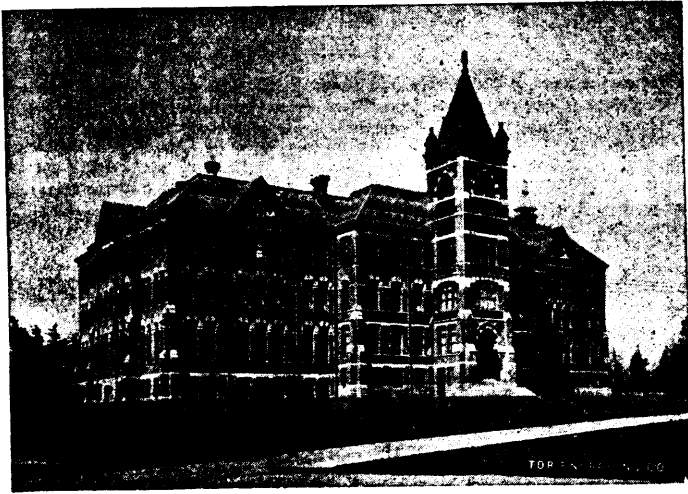
Commissioner Public Works and Mines,

HALIFAX, NOVA SCOTIA.

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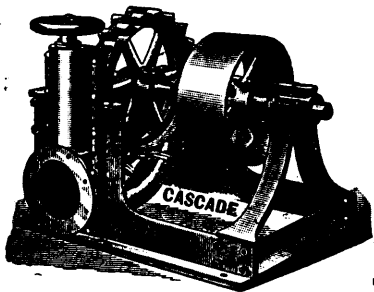
Special Attention is directed to the Facilities Possessed by the School for giving instruction in Mining Engineering. Practical instruction is given in Drawing and Surveying, and in the following Laboratories:

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- 2—ASSAYING
- 3—MILLING
- 4—STEAM
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- 6—ELECTRICAL
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The School also has good collections of Minerals, Rocks and Fossils. Special Students will be received as well as those taking regular courses.

FOR FULL INFORMATION SEE CALENDAR.

L. B. STEWART, Secretary.



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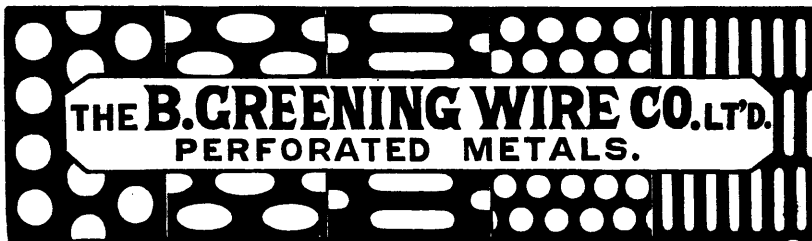
MINING LAWS OF ONTARIO.

ANY person may explore Crown Lands for minerals. Mining lands may be taken up as surveyed locations or staked claims. Locations range from 40 to 320 acres. Claims range from 10 to 20 acres on vein or lode. Locations may be acquired in fee or under leasehold. Price of locations north of French River, \$2 to \$3 per acre, and south of it, \$2 to \$1.50, according to distance from railway. Rent of locations first year 60c. to \$1 per acre, and subsequent years 15c. to 25c. per acre. Rent of claims, \$1 per acre each year. Claims must be worked continuously. Royalty on ores specified in the Act, 2 per cent. of value at pit's mouth less cost of labor and explosives. Royalty not charged until seven years from date of patent or lease, nor (as provided in s. 4 (3) of the Mines' Act, 1892), until fifteen years in the case of an original discovery of ore or mineral. Original discoverer of ore or mineral on claim entitled to stake out a second claim. Crown Lands sold under provisions of mining laws in force prior to 4th May, 1891, exempt from royalty. Copies of the Mines Act, 1892, Amendment Act, 1894, may be had on application to

ARCHIBALD BLUE,

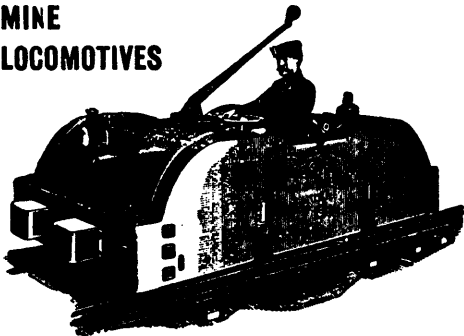
Director Bureau of Mines

TORONTO, May 25th, 1894.



HAMILTON. ONTARIO.

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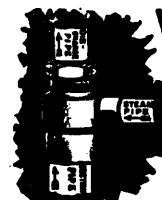
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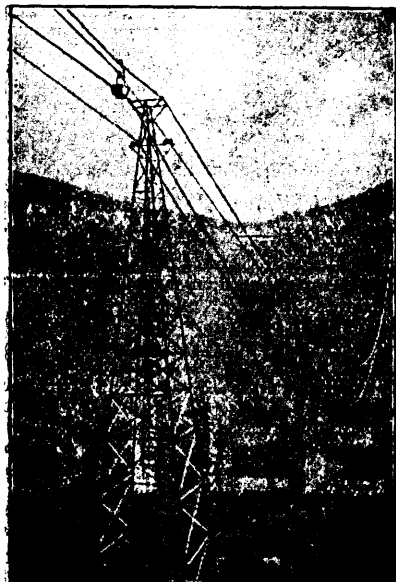
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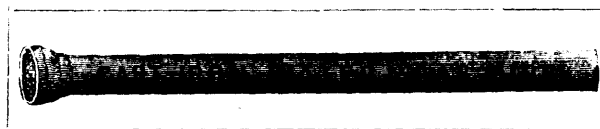
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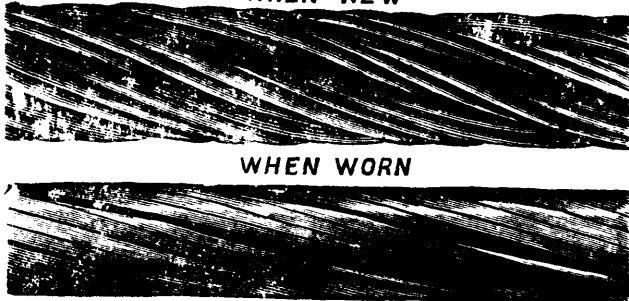
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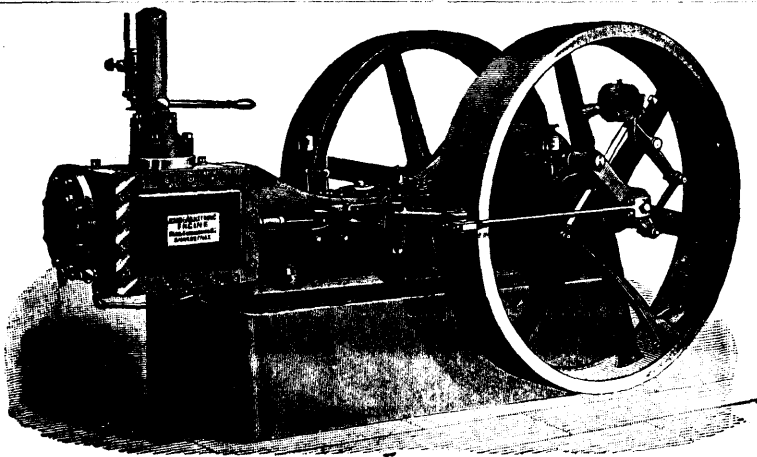
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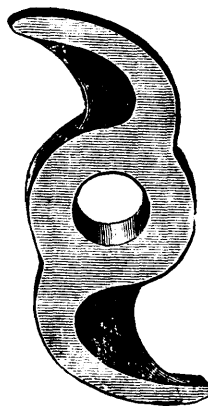
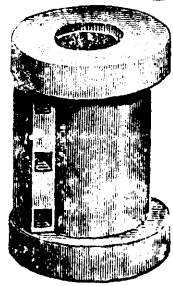
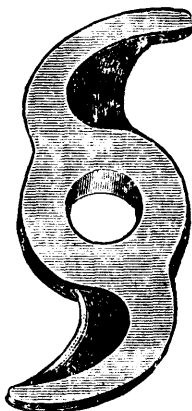
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