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# CANADIAN

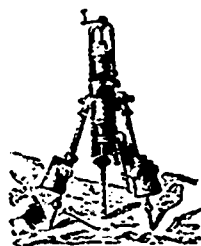
# MINING REVIEW

Vol. 4.—No. 9.

1886—OTTAWA, DECEMBER—1886.

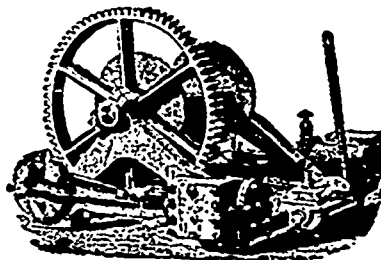
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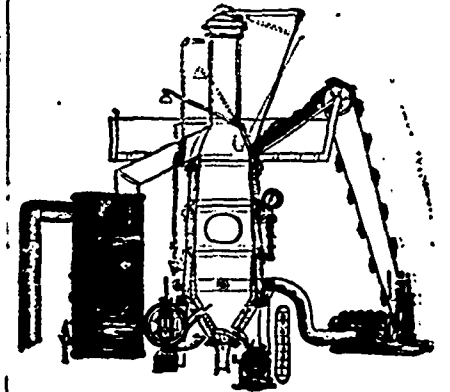
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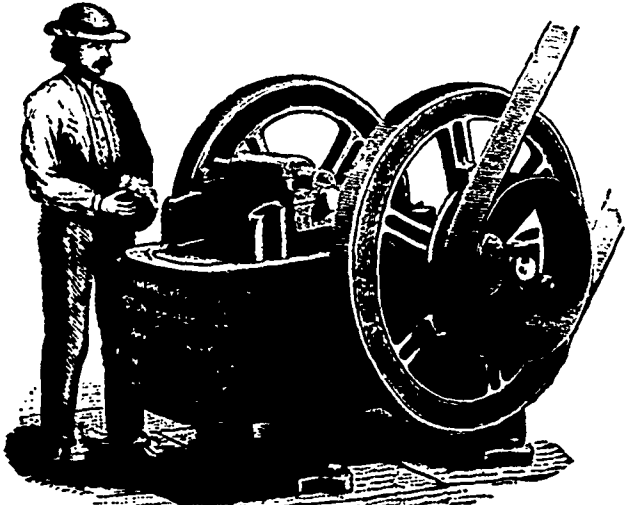
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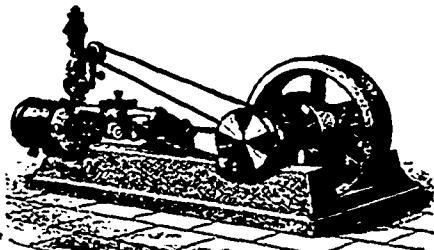
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SEALED TENDERS, addressed to the Postmaster General will be received at Ottawa until noon on FRIDAY, 12th December, 1886, for the conveyance of Her Majesty's Mails on a proposed Contract for four years, three times per week each way, between ASHTON and PROSPECT, from the 1st January next.

Printed notices containing further information as to conditions of proposed Contract may be seen and blank forms of Tender may be obtained at the Post Offices of ASHTON, Munster, Baye Hill and Prospect, and at this office.

T. P. FRENCH,  
Post Office Inspector.

Post Office Inspector's Office,  
Ottawa, 27th Oct., 1886.

**Notice to Contractors.**

SEALED TENDERS addressed to the undersigned will be received at this Office until FRIDAY, the 19th instant, for the Clearing and Removal of Snow, etc., from the Public Buildings, Ottawa; and also for the Removal of Snow, etc., from the roofs of buildings, out-buildings, walks, avenues or roads, etc., at Rideau Hall.

Forms of Tender and Specifications can be had at this office, where all necessary information can be obtained.

Separate Tenders will be required for each work, and must be enclosed "Tender for Removal of Snow, Public Buildings," and "Removal of Snow, Rideau Hall," respectively.

Each tender must be accompanied by an accepted bank cheque made payable to the order of the Honorable the Minister of Public Works, equal to five per cent. of the amount of the tender, which will be forfeited if the party decline to enter into a contract when called upon to do so, or if he fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department will not be bound to accept the lowest or any tender.

By order,  
A. GOBELL,  
Secretary

Department of Public Works,  
Ottawa, 12th Nov., 1886.

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SEALED TENDERS addressed to the undersigned, and enclosed "Tender for Du Lavee Works" will be received until FRIDAY, the 27th day of NOVEMBER, next, inclusively, for the construction of a Lock and Dam and works in connection therewith, on the River Du Lavee at Little Rapids, Ottawa County, Quebec, in accordance with a plan and specification to be sent at the Department of Public Works, Ottawa, on and after Friday, the 3th of November next, where printed forms of tender can be obtained.

Persons desirous of tendering are requested to make personal enquiry relative to the work to be done, and to examine the locality themselves, and are notified that tenders will not be considered unless made on the printed forms supplied, the blanks properly filled in, and signed with their actual signatures.

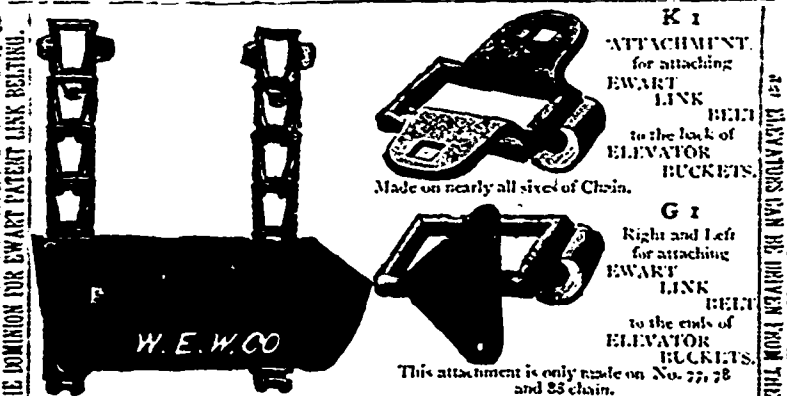
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By order,  
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*The CANADIAN MINING REVIEW is devoted to the opening up of the mineral wealth of the Dominion, and its publishers will be thankful for any encouragement they may receive at the hands of those who are interested in its speedy development.*

*Visitors from the mining districts as well as others interested in Canadian Mineral Lands are cordially invited to call at our office.*

*Mining news and reports of new discoveries of mineral deposits are solicited.*

*All matter for publication in the REVIEW should be received at the office not later than the 20th of the month.*

*Address all correspondence, &c., to the Publishers of the CANADIAN MINING REVIEW, Ottawa.*

Mr. W. A. Allan, of this city, has shown us some very fine blocks of white marble which he has just received from his property in the Upper Ottawa district. The specimens are of a very superior quality, fully equal to the best Italian grey marble. The blocks are to be sawn and placed on exhibition at an early date.

In our last issue attention was drawn to the specimens of chromic iron recently exhibited at the Colonial and Indian Exhibition and to the deposits of this ore to be found within the Province of Quebec. We have since received a communication from an authority in that province who states that last winter the Hon. L. G. Ross and Dr. James Reed, Reedsdale, shipped several tons of the ore, averaging 50 per cent. of chromic oxide, to Philadelphia, at \$18 per ton of 1240 lbs. The ore was placed on the cars at this price at Robertson station, Quebec Central Railway (near the Thitford Asbestos Mines). Samples from the deposit assayed by Professor Ditmar, Anderson's College, Glasgow, average 52.48 chromic oxide. The ore is found in large quantities on lot 7, range 10, at Leeds, Megantic County, while another deposit exists on lot 16, in the 4th range, Thitford. The writer adds "that among other purposes it is used for rapid tannery, and that there is no difficulty in getting large quantities of the ore, provided remunerative prices could be obtained for it."

If testimony was required to demonstrate the great and valuable work that is being accomplished from year to year by our Geological Survey it is undoubtedly evi-

denced in the voluminous reports of its doings periodically issued by its eminent director, Dr. Selwyn. That for 1885 is before us, and like its predecessors it is, from beginning to end, replete with much valuable information regarding the topography, the geological structure, and the mineral wealth of our Dominion. As in former years the work of exploration and survey has been vigorously pursued over a vast area, portions of every province and territory from Nova Scotia to the Pacific coast, have been visited and investigated, and a flood of new light has been thrown upon districts hitherto unknown or but imperfectly understood. To the public at large the report will prove of inestimable value while the student of our geology and particularly of our mineralogy will find within its necessarily condensed but very able summary, much useful matter of great variety and varied interest. The notes and statistics bearing upon our mineral resources are particularly worthy of attention.

Referring to the establishment of a mining and mineralogical department and the collection and publication by the Survey of statistics of mines and mineral product, a question which of late has been the subject of much wholesome discussion. Dr. Selwyn writes:—"I may say that after carefully considering the matter in all its aspects, I am led to the belief that the system I originally adopted, namely, that of issuing a circular with questions to be answered on a form printed for this purpose, and when convenient or considered necessary, to be accompanied by personal application on the ground, is that which is most likely to afford the desired result. There are two gentlemen, trained mining engineers, now employed on the survey, to whom the work of issuing, collecting and compiling the returns might be entrusted, and, and who might also each year visit and critically examine and report on one or two mining districts. In this way, every mining district in the country would be visited at intervals of one or two years, unless some special development called for more frequent examination. At present the chief mining developments are in the provinces of Nova Scotia, Quebec and British Columbia, and in each of these provinces the local government employs a mining inspector or engineer, who collects statistics and reports on the mines of the province.

"It would not, therefore, seem desirable or necessary that the work should also be done in these provinces by the Geological Survey, but with the co-operation and consent of the provincial authorities, the results obtained by their officers might be incorporated in the general statement issued annually by the Geological Survey, and thus gain wider publicity.

"So far as the special examination of mining districts is concerned, a commencement was already made in 1883 and continued in 1884, the districts examined being: In 1883, the Lake of the Woods gold region, and the phosphate region in the townships of Wakefield and Templeton; and in 1884 the Marmora gold and iron bearing region

around the north shore of Lake Superior; also some of the mines in the province of Quebec. If the scheme now proposed is carried out, no further assistance would be required, but the two gentlemen named, Messrs. E. Coste and E. D. Ingall, should be appointed on the permanent staff with the title of 'Mining Geologists.'

Again we have to add that the establishment of a thoroughly organized and equipped Bureau of Mines and Statistics is of vital importance to the country at large, and that if there is to be such an establishment it must be founded on a permanent basis with an adequate and efficient staff. The work of collecting and compiling information and statistics in connection with Canadian mines and minerals is too important to be left to the tender mercy of any half-hearted organization, and it can never be done in a manner that will be acceptable to the mining public until such time as a distinct and separate department, thoroughly and efficiently equipped has been added to the Survey.

In another column our readers will find a reprint of Mr. Eugène Coste's valuable pamphlet, "Observations on Mining Laws and Mining in Canada," which is presented as Part K of the Annual Report, 1885, just published by the Geological and Natural History Survey of Canada. Mr. Coste, who, by-the-way, is a graduate of the School of Mines, Paris, and a mining engineer of marked ability, has had an extensive and varied experience of the mining districts of England and Europe, and his remarks on the state of the mining industry of our Dominion, and particularly to those districts lying within the Provinces of Ontario and Quebec, will be read with much interest. His suggestions for the better development of the mineral resources of the country are particularly well timed and worthy of the best attention.

Among other papers read before a recent meeting of the Mining Institute of Scotland, was one by Mr. David Reid, Glasgow, on "Pitkins Electric Safety Lamp." Examples of the lamp were exhibited and explained from which it was shown that it consists of a small storage battery encased in a light box with lamp attached capable of being carried by the miner into his working place. The lecturer stated that it gave a splendid light underground and that when perfected it would become the lamp of the future.

An effort is being made by several leading newspapers to impress upon the Dominion Government the necessity of giving adequate protection to our iron industry. The Montreal Star, handling the question editorially, says: "It is not considered advisable at present to increase the custom duties on iron and steel there can be no general objection to the passage of an act obliging all railways receiving public assistance to use rails and rolling stock of Canadian manufacture. If such a law was passed and pamphlets descriptive of the

iron and coal deposits of the Dominion sent to the leading iron men of Great Britain and the United States there can be no doubt that capital would be brought into the country to develop our iron resources, and a great industry would be established on a paying basis. The first step should be to advertise for tenders for Canadian made rails for the extension of the Intercolonial railway through Cape Breton. If it were understood that, in future, not only Government railways, but all railways receiving public aid, would be obliged to secure their construction materials in Canada, there would be no difficulty in securing tenders. The construction of the railway through Cape Breton would perhaps be delayed for a short time by such an arrangement, but no part of the Dominion has more to gain from the adoption of such a policy than the island of Cape Breton. The *Island Reporter* recently claimed that the minerals of Cape Breton Island were worth more to the Dominion than all the farming lands of the great North-West, and certain it is that noted geologists have said that there is more coal and iron to the square inch in that end of Nova Scotia than in any other known quarter of the world. The island would certainly be benefited by the encouragement of the iron industry. By the immediate adoption of such a policy, the Government could prepare the way for a revision of the tariff, giving adequate protection to every branch of the iron and steel industry."

A statement which evidently emanated from the associated press agent at New Glasgow, Nova Scotia, recently gained currency to the effect that a very bitter feeling had been created by the action of the Manager of the Dominion Coal Mines at Westville in refusing to permit the men presently working on full time there to share their work with those of their fellows who had been thrown out of employment at the close of the shipping season. On enquiry it appears that the company made every effort to retain as many of their hands as possible and that at present there are more employees than their limited winter operations demand. This will be the better understood when it is learnt that the decrease of men is only 35 per cent., while the actual work done shows a falling off of 60 per cent. The criticisms which the action of the manager has involved seem to be uncalled for.

### Mineral Deposits.

#### BETWEEN THE GREAT LAKES AND THE HUDSON BAY.

In an article to an esteemed contemporary on the metallic ores to be found between the great lakes and the Hudson Bay, Dr. Robert Bell of our Geological Survey writes: "Iron has been found in several places not far from Algoma Mills, and again at Desert Lake, north of the Bruce mines. A deposit of iron was reported on an island in Lake Nipissing by Mr. Murray, of the Geological Survey, nearly thirty years ago. Still farther north, toward James's Bay, is the largest iron deposit yet known in that whole country, and situated at the foot of the Grand

Rapid of the Mattagami River. It was first pointed out by me in 1875. Proceeding toward Lake Superior, very large quantities of iron ore are found, not far north of Batchawana Bay. I also found indications of large deposits of iron near the Montreal and Perch rivers. A deposit of hematite was discovered by one of my assistants on the Slate islands, in 1870, and some low-grade magnetite has long been known to occur at the mouth of the Little Pic River. To the north of this region, a perfect mountain of iron has been discovered by that fortunate prospector, Mr. Peter McKeller, of Fort William. It is back in the woods, in the unsurveyed region, about 200 miles northeast of Port Arthur. In my reports of 1869 and 1870, I mentioned certain discoveries of iron near Long Lake, on the south side of Lake Nipigon, on the Sturgeon River, some of which have since been found to be important. A comparatively valuable deposit of magnetite, in workable quantities, occurs near Silver Lake, not far from the head of Thunder Bay. Quite lately, a rich deposit of magnetite has been found on the celebrated 3 A silver location, Thunder Bay. Still farther west, during the past summer, two important discoveries have been made, one of them on the Atik-Okan (Reindeer Antler), just north of the south bend of the Seine River, about 100 miles northwest of Thunder Bay, and thirty miles south of the Canadian Pacific Railroad track. The ore is of first-rate quality, and described as occurring in immense quantities, and it is probable that it will be extensively worked before long.

The other large deposit occurs about 100 miles farther west, and is also south of the Canadian Pacific Railroad, at a considerable distance to the eastward of the Lake of the Woods. There is a rich deposit of hematite on Big Island in Lake Winnipeg. Between Lake Winnipeg and York Factory, on Hudson's Bay, at the narrows of Kneec Lake, there is a large quantity of magnetite. I discovered one deposit of rich magnetite, in the region I was exploring this summer, but am unable to give particulars until I have made my official report.

Copper is known to exist in more or less promising quantities at numerous places on the north shore of Lake Huron. One of these is the Wallace mine, near Killarney, which was worked at one time for both copper and nickel. Then passing westward, the celebrated Bruce mines are situated about 40 miles east Sault Ste. Marie. Work was begun here in 1846 and continued until 1876. In the palmiest days of its enterprise, large numbers of Cornish miners were employed, and quite a town was built. In 1876, the mines closed, and it being the year of the Philadelphia exhibition, I collected statistics that showed the output during the thirty years to have amounted to \$3,300,000. Copper ore has been found in notable quantities at several points inland from the Bruce mines and around Echo Lake.

I have not yet examined the Sudbury mines personally, but at the time ore was discovered there, some three or four years ago, I had samples of all the different kinds sent to me. The first ore prepared for market amounted to about 3,000 tons, which, however, was of a lower grade than the producers supposed, and I was informed that, on the advice of one of their New York correspondents, they cobbed it over and reduced the 3,000 tons to 1,000, which was found to contain about 7 per cent. of metal. In my explorations in the extensive region between Lake Huron and Hudson's Bay, I have found many indications of copper, which have been reported from time to time. Among the earliest copper mining enterprises in Canada, were those of the

Quebec and British American mining companies. The works of the former were carried on at Namanise (Little Sturgeon), in the Lake Superior region. In later years the Lake Superior Native Copper Company carried on operations in the same neighborhood. Recently, this company has been reorganized as the Lake Superior Copper Company, but little is done at present. On Michipicoten Island, in the northeast angle of Lake Superior, a company, called the Michipicoten Native Copper Company, was organized a few years ago. After working a short time, this company was also reorganized, and last winter had a small force of men at work. At both the above localities, copper occurs in the native state. About forty years ago, numerous locations were taken up, principally in the names of gentlemen residing in Montreal, but which were held by the Montreal Mining Company. These were afterward sold to what was called the Silver Islet Mining Company, but more correctly the Ontario Mineral Lands Company. One of the locations thus taken up was the celebrated Wood's location, in which Silver Islet is situated. Some locations were worked near Nipigon Bay and southwest of Thunder Bay. I have found indications of copper in many places northwest of Lake Superior.

The principal deposits of lead in the district under consideration are at the Victoria mine, near Garden River, a short distance east of Sault Ste. Marie. This mine was principally owned in Quebec City. A short distance to the north of that, another lead mine, the Cascade, has also been worked to some extent. On the northwest side of Black Bay, Lake Superior, a rich vein of lead was worked by the Enterprise Mining Company. Other large deposits of this ore are known to exist in the same neighborhood, but, owing to the very low price of lead at the present time, there is not much inducement to open them. Around Thunder Bay also, a number of lead-bearing veins have been discovered. Lead occurs in several localities on the Lake of the Woods.

Silver is also well represented. It was first found many years ago on Lake Superior, notably on Michipicoten Island, and Prince's Location, not far from Port Arthur. But the first discovery of silver to attract public attention in late years was that afterwards known as the Thunder Bay mine, situated about three miles northeast of Port Arthur. Here, native silver was found in large quantities, in quartz at the outcrop of the vein. The mine promised to be so rich that immediate steps were taken to prevent its being plundered, owing to the silver being so easily obtainable on the surface. Attempts were made to open the mine, but from various causes, prominent among which was bad management, it never made a success, and has been closed for some years. A short distance southwest of Thunder Bay, another mine was discovered and worked under the name of the Shuniah mine, afterward changed to the Duncan mine. The celebrated Silver Islet mine was discovered in 1868, while Wood's Location was being surveyed by Mr. Thomas Macfarlane, now chief analyst in the Inland Revenue Department here. One of the first blasts at the surface of the vein threw out silver ore to the amount of \$1,500. The mine was worked to the depth of 1,200 feet, and \$2,500,000 worth of silver is said to have been produced. The silver mines at present attracting attention are situated inland or in two groups at twenty-five and thirty-five miles southwest of Port Arthur, in the White Fish River region. The mines in which most work has been done are the Rabbit Mountain, Beaver, Porcupine, and East and West End Silver

Mountain. The three first mentioned are actively worked, and quite lately, the East End Silver Mountain was sold to a joint-stock company in Liverpool for \$150,000 cash, and the company has undertaken to spend a still larger sum on the property.

Traces of gold have been found in various places north of Lake Huron. On Lake Superior a vein containing visible nuggets occurs in Jackfish Bay. On Partridge Lake, nearly one hundred miles to the northwest of Port Arthur, small nuggets are disseminated through a large mass of quartz, and some distance west of this locality another rich gold-bearing vein has been discovered. The Huronian mine, owned by an Ottawa company, is situated near the height of land about one hundred miles west of Port Arthur. Here, a well-marked vein has been worked to some extent. A crushing-mill has been erected, but the principal impediment in the way of the working of this mine is the want of transportation facilities. A good road to the mine has become absolutely necessary. Coal has also been discovered in numerous localities on the Lake of the Woods, but at present little or nothing is done.

### Personal.

Our readers will be glad to learn of the return from Britain of Dr. A. R. Selwyn, director of our Geological Survey. Dr. Selwyn held the position of Canadian Commissioner to the late Colonial and Indian Exhibition, and was created a C. M. G. by Her Majesty the Queen.

### Phosphate Mining.

THE HIGH ROCK MINE, BUCKINGHAM.

The reports received from this mine are very satisfactory, and indicate that during the past year, operations have been actively pursued and that many important improvements have been made.

Five pits are now working, and at the deepest of these, that known as No. 8, where some 180 feet has been sunk, the miners are at present drifting in the bottom on a paying vein of phosphate about three feet wide. At No. 5 pit, the well-known "Bonanza," they are also drifting at a depth of 160 feet on a vein ranging from 1 to 4 feet in width, which is also paying well. No. 11 pit, 75 feet deep, is reported to be the best, and there, running under the hill on a 500 feet level, the management have discovered a vein of the purest ore 30 feet wide by 15 feet high. Mr. Pickford, the manager, says that "it is the finest show which has ever been seen on the hill, it having yielded last month 296 tons with an average of ten men."

The output for November, 704 tons, is the best on record at the mine, while that for December would probably have exceeded this but for the holidays. As it is, the output will be considerably over 600 tons. So satisfactory are the present state of affairs that the company contemplate increasing the staff to 250 men next summer, and working them in night and day shifts. At present about 120 men are employed.

During the past summer a tramroad extending from the mines to the river landing, two miles in length, has been constructed and some 6,000 tons of ore have been transported over this. It should be mentioned that the total shipment for this season was 6,349 tons, and that this is the largest quantity ever shipped from this property in any one year.

Under the management of Mr. W. W. Pickford, who has so ably conducted the mine since 1884, tramroads have been constructed, new machinery erected, and many other valuable improvements made. Not a little credit is due to this gentleman for the very satisfactory condition of things at this property.

### Graphite.

Although Graphite has been known from time immemorial, and its name at once indicates the antiquity of its principal use, its geological origin is still a matter of doubt, and its properties not yet half understood. It belongs to no particular geological horizon, but occurs in rocks of all ages, in beds; imbedded masses, laminae, or scales, more commonly in granite, gneiss, mica, slate, crystalline limestone, and occasionally with deposits of coal. The famous Borrowdale variety is found in nests, in trap, in clay slate. Nearly every locality presents it in some new association, so that it is scarcely to be wondered at that geologists have been puzzled to account for the origin of a mineral that makes its appearance in utter disregard of the laws of deposition, stratification, injection or age. The recent progress of chemistry has thrown some light on this subject, and new theories have been advanced, tending to dispute the vegetable origin of graphite, and to explain its presence on the principle of the decomposition of cyanogen or of other intro-carbon compounds. In the preparation of caustic soda, cyanide of sodium is produced, and when, in the course of the operation, Chili saltpetre is added, to oxidise the sulphides of iron and sodium, and the mass is in a state of fusion, graphite arising from the decomposition of the cyanide rises to the top, where it swims and can be skimmed off, washed and dried, when it presents the appearance of brilliant, light power, perfectly pure and admirably adapted to the manufacture of pencils, and many other purposes. The brilliant, red crystals which form in blast furnaces and now and then give rise to what is called "salamander," were formerly supposed to be pure titanium. Wohler afterwards shewed that they contained cyanogen, and this discovery, together with the appearance of cyanogen in the soda ash manufacture, has led chemists to suspect that the formation of artificial graphite in iron furnaces is not always one to the solution of an excess of carbon in the molten iron, but may be referred back to a compound of nitrogen with carbon, in other words, to the decomposition of cyanogen. Applying these observations to geological phenomena, some authors seek to account for the formation of graphite in nature, on the principle of the chemical decomposition of the cyanides. It is certainly a very ingenious theory, and has many strong points to sustain it, and as it may finally conduct us to an artificial method for the production of graphite, in any quantity and at reasonable rates run it deserves the careful study and experimental research of all parties interested in the development of this branch of industry.

The *Times* announces that a second assay of rock from the Cowichan ledge, B.C. discovered and located by Mr. Hugh Bell, of Somenos, went \$18 of gold to the ton, and a little silver. Both of the samples referred to and a former sample assayed a week previous, went \$20 in gold, and were from surface rock. It is thought likely that when the lode, which is an extensive one, shall have been sunk upon still better results will be developed.

### British Columbia Milling and Mining Company.

Report of Mr. E. A. Koch to Joseph Heywood President of the Company:—

SIR.—At the request of Mr. Joseph Mason by telegraph, dated the 4th inst., I have carefully examined your property, consisting of the American, Cariboo, St. Laurent, and Wilkinson claims, together with the machinery stored in the two buildings. The most prominent surface indications of the existence of mineral-bearing veins I find in this district is the extremely large chimney or blow-out, of quartz, which comes to the surface near the line dividing the St. Laurent and Cariboo claims. It is a very prominent feature and of itself speaks well for the vein, as samples taken from it for a distance of 750 feet, or up to the centre of the Cariboo claim, immediately over the deep shaft, showed gold in four separate assays ranging from traces of gold up to \$7.30 per ton of 2000 pounds. While its prominence and showing of gold would have been encouraging, that of itself would not by any means have been sufficient to justify any extraordinary expense except by way of prospecting in sinking, say one hundred feet on or near it, and then cross-cutting the vein and drifting some distance on it.

But the 50-foot shaft, sunk some 700 feet from the great blow-out or chimney, has to a great extent done the developing mentioned above.

The tunnel which taps the vein is driven in the hill about the centre of the three first mentioned claims and taps and cross-cuts the vein fifty feet from the surface, where the vein continues its course as on the surface, a little west of northwest, and at that point I find the vein between walls to be 17 feet. It is true, a large amount of slate (all of which is highly metaline) is more or less intermixed with the quartz in the vein.

The greater portion of the ore at that point is white quartz, which carries about \$3 per ton of gold; yet in many places the ore is heavily charged with sulphurets which assay from \$3 to so high as \$120.70 per ton; while the entire mass of the vein is highly colored with copper stains, which is indicative of a strong and living vein. You could not have done otherwise than continue your shaft below the level of the adit, with such encouraging prospects and assurance of developing a good mine.

I carefully examined your waste dump that came out of the shaft, as well as the ore now in the ore-house, and the discarded ore, which had been thrown out as refuse. I made one assay of the waste dump, and two from the refuse ore, while I carefully sampled the ore in the ore-house, from which I made three assays.

My assay from the waste dump showed \$6.20 per ton, while it is quite possible that some will assay much higher, while other samples will only show traces of gold; yet I think eventually it will all be milled.

The two assays from the discarded ore went \$4.30 and \$47.03 respectively, while the samples from the ore-house assayed \$14.20, \$86.03 and one traces of gold only. I made several other assays, which I kept no note of. I made them in order, if possible, to ascertain which particular class of sulphurets carries the gold, as in some of my assays of ore from different mines, the show is very encouraging, while in others the showing of gold is small while the ore looks equally good.

You are no doubt aware that the vein is not exposed by any work done on the St. Laurent or American claims, yet beyond a doubt the vein is continuous, and not only passes through the

claims but also far beyond, as is evidenced by the work done in the Pinkerton shaft, some 3,000 feet northwest from your shaft.

True, the work in that shaft only exposed a small, or supposed small, vein, the ore from which shows about the average amount of gold shown in the ore taken from the Cariboo shaft. As regards the narrowness of the vein at that point, it can be accounted for, in two ways; first, it is true the owners cut through the ore, coming to a supposed slate wall, but it is quite possible, had they cut through the slate more ore would have been found. (See report to government.)

Yet, I will admit, it is possible that they did cut through all the ore that existed at that point; but it must be remembered that veins do not continue the same width to great distances, and even where they do continue the same width between walls, they do not always carry the same width of ore; nor must you be surprised in working your mine, to sometimes come upon places in your vein which do not carry any ore at all, but your mine is, however, safe if you continue to have good walls.

Thus the necessity of keeping a mine well prospected and open, in advance of the capacity of the reduction works, not only to insure a steady supply of ore but to guard against delay in case of an accident in any part of the mine. Returning to the southeast end of the St. Laurent claim, no work has been done to expose the vein; yet it can be traced where it crosses Stout's gulch, and again at the canon, as it passes up through the "Black Jack" hydraulic claim towards the Wilkinson, and old Prosperine claims and not making an angle and passing below the old Cooper shaft and to the Vivian claim as formerly supposed.

In fact, so far as developments have been made on the mines of this district, your vein surely deserves the name it is known by, viz., "Bonanza." Some would go so far as to assert that you have a great mine, I cannot do so. I will, however, go so far as to say that your showing is exceptionally good. Few mining men in any country have such encouraging prospects upon which to commence operations. The increase in the percentage of the sulphurets denotes a continuance or permanency of the vein. You will not be likely to find such a high percentage of sulphurets in all the workings of the mine, any more than you will always be likely to have a 22 foot vein, yet sufficient can be seen to justify the erection of permanent hoisting and pumping machinery.

I find amongst your machinery, power sufficient for a 30-stamp mill, with sufficient power to spare to drive the necessary concentrators.

The pans, and immense amount of accompanying machinery, are useless in this district. A very small percentage of the gold will be saved in the batteries and outside plates. The pulp must then pass over concentrators, where from 75 to 80 per cent of the sulphurets are gathered; they must then be roasted in order to desulphurize them, when they are then chloridized. The process is not so expensive as continuous amalgamation (pan process), as the original cost, including freight, engine power, steam to drive them, wear of pans, shoes, etc., makes continuous amalgamation in a district like this extremely expensive. True, you lose the use of your pans but you gain power for 20 more stamps, which, with your mine, I think a great item, as I deem it advisable to crush all the ore as it comes from the mine, as it is a very difficult matter to select gold quartz unless you know that you are passing through a barren place in the vein. There are three kinds of concentrators now in use in California, the True, Challenge, and

Golden Gate, all good. I, as others, have a choice. I must not neglect calling your attention to the fact that the greatest care should be taken of boilers in so remote a district as this; not alone in order to save the cost of buying and shipping, or repairing, but because when a boiler has to be repaired or replaced, either the mine must close down and fill up with water, or the mill hang idle, which always means a stoppage of income while expenses go on. I recommend that all boilers in this district have attached to them a Llewellyn filter and heater (Address J. M. Streeten, rooms 7 & 8; 330 Pine street, for circular), universally used in San Francisco and the largest mills in the country. There may be others equally good, but they are not in use in California.

I can say but little in reference to the Wilkinson claim. I have been to the mine four times and fail to find any cause to change my original opinion of the ground: I can say nothing to justify but one opinion, and that is, that it is a continuation of the Bonanza vein, and while nothing positive can be said as to the width of the vein at that point, sufficient has been shown, by work done on that claim, as well as on the Proserpine (some 400 feet to the south-east), to justify me in thinking the vein is large and strong at that point.

The Wilkinson shaft has caved so badly that it would be folly to re-open it. I find many many tons of ore on the dump, all of which is heavily charged with gold-bearing sulphurets, while the slate which comes from the vein at that point, as well as from the Proserpine shaft, (which is a hundred feet deep), is also highly metaline. While the assays do not go so high as some of those of the Cariboo, they are more uniform, even the slates showing well in gold, by assay. It would not in my judgment, be hazardous to prepare for and sink a good working and pumping shaft on the mine. Developments at the bottom of the 100-foot shaft, on the Proserpine mine, justify that conclusion. I consider the property valuable.

I will state, however, that in my judgment some considerable depth must be obtained before the vein will be found well in place, or so snugly encased in true walls as our California mines are usually found, and indeed I may say the same of the Cariboo; yet thousands of tons of pay-ore will be milled before the above-mentioned point is reached.

I have just had the pleasure of going to the bottom of your shaft on the Cariboo claim, which I find to be fifty feet deep from the level of the adit, making one hundred feet from the surface, or from the point where the vein crosses the surface in its course from the great blow-out toward the Lowhee creek and through the American claim.

I find the shaft has an irregular dip, but from top to bottom has an angle of about sixty-five degrees. At the bottom I was not surprised, after viewing the vein during my descent, as nothing but quartz thickly interspersed with sulphurets is visible on all sides.

I find the vein to be well encased in true walls at the bottom, except that the quartz seems to have an inclination to reach out in the hanging wall. The vein is twenty-three feet wide at the bottom and doubtless will continue to be that, or perhaps increase in width as depth is attained. I find about eight feet of the vein next to the hanging wall highly impregnated with sulphurets of the same general character as those in the ore house, which evidently came from the bottom of the shaft; also about four feet of the ore on the foot wall almost identical with that on the hanging wall, while the remaining portion of the vein

seems to be composed of white quartz, evidently of a low grade, yet containing some sulphurets. I consider the outlook extremely encouraging, and have sampled it for essays. Depth will, beyond doubt, make a great improvement in the value of the property.

I consider the selection of your mill site a very poor one, and refer you to my report to the government on that subject; also to the subject of manager, which, next to the mine, is the all important point to insure success. You will recollect that, while many gold mines pay uniformly for hundred of feet in depth, that it is extremely difficult to sample a gold mine and say what it will mill per ton, and more particularly in a sulphuret mine, as often within the space of one foot two samples may be taken, one showing traces of gold only, while the other may assay several hundred dollars per ton. I also find that even in the sulphuret ores of this district, spots will be found some distance from the surface where the showing of free-gold exceeds that which is locked up in the surrounding sulphurets. That must not lead the miner astray and cause him to think he can save the gold without concentrating, for, while such spots may frequently occur, yet all the mines so far discovered in this district are strictly gold-bearing sulphuret veins. I do not advise you as to the manner of commencing the work on your mines, as when you decide to commence operations, you will doubtless secure a practical man as manager. I remain, very respectfully,

Yours, etc.,

GEO. A. KOCH.

### Our Mining and Mining Laws.

BY EUGENE COSTE, M.E.

While engaged during the last two seasons, on behalf of the Geological Survey of Canada, in the examination of several mining districts in different parts of the Dominion, I have been impressed by the unsatisfactory state of the mining industry in these districts, the unbusiness like way in which the work is carried on at most of the few mines that are being developed, the consequent immense loss to the country, and the apparent want of laws and regulations for the encouragement of real mining and the development of our great mineral wealth.

As these things forced themselves upon my attention day after day in the course of my inspection, the following questions suggested themselves: Why so little mining activity in this country so rich in mineral resources, and in which so many mining regions have long since been discovered? Why so few real mines and so meagre a production of ore? Why have so many mining schemes failed, and why, in several parts of Canada, have good mines been abandoned, which will eventually be worked again with profit? How explain that several mining districts, where splendid discoveries were made years ago, are yet comparatively unexplored; and that the true value of these districts is still unknown?

In trying to answer these questions, which concern one of the great sources of wealth for our young Dominion, I am led to the following conclusions: If our ore production is so meagre and if we have so few real mines, it is because, in the provinces of Ontario and Quebec and in the North-West territory, where the districts which I visited are situated, the laws allow speculators to purchase very cheaply large tracts of "mineral lands" which they are not compelled to work and which they hold, against the interest of the mining industry and of the country, awaiting

fabulous prices for them and so preventing *bona fide* working companies from developing them. This is evidently the reason why so many mining schemes have failed; they were only schemes of speculators trying to make a show, and with that object in view, instead of first opening the ground to ascertain its value, as a really good practical miner would have done, they have built handsome residences and villages in the woods and have done no mining for fear the indications would "play out." It is also the reason why many companies having bought, at very high figures, from these speculators, entirely unprospected mining locations, are deceived as to the value of the property, or, in case the property happens to be good, are nevertheless too poor to work it profitably after so great an outlay of capital to purchase it from the speculators. It is because these owners of "mineral lands" put extravagant values on them, and are, in consequence afraid of the truth and fear the results of complete investigations, that our mining districts remain unprospected, on the surface as well as underground, and that we cannot arrive at a knowledge of their real value.

I shall confine my remarks to the Dominion lands and the Provinces of Ontario and Quebec, where the mining districts I have visited are situated, and shall first endeavor to demonstrate how fatal to the mining industry is the system in force under existing laws and how necessary it is to abandon the custom of selling mining properties or the mining rights if the speedy development of the already known as well as the yet unknown mineral resources of the Dominion is desired. I shall further endeavor to indicate the principles which should be borne in mind in framing laws and regulations for the disposal of mineral deposits and the encouragement of mining in new countries.

A *résumé* of the laws now in force, over the Dominion lands and in the provinces of Ontario and Quebec, or at least of as much of these as concern the acquisition of the mining rights is here indispensable.

#### DOMINION LANDS.

The following are the mining regulations which govern the disposal of "mineral lands" other than coal lands:

Any person may explore vacant Dominion lands, either by surface or subterranean prospecting.

A mining location, except for iron, shall not exceed 40 acres, the length not being more than three times the breadth; the boundaries beneath the surface being the vertical planes in which its surface boundaries lie.

For the mining of iron, the Minister of the Interior may grant a location of 160 acres.

Having marked the location, the occupant, on paying \$5 in registering the claim, shall have the mineral right for one year.

During that year, at any time, he can purchase at the rate of \$5 per acre, cash, if he proves he has expended \$500 in actual mining operations on the claim, and if he makes a \$50 deposit, with the agent of the Government, for the survey of the claim.

For "placer" mining (gold alluvial digging) every person, holding a receipt renewable every year, can take up only one claim of about 100 feet square in the same locality, and this claim must not remain unworked more than 72 hours at a time.

A royalty of 2½ per cent is reserved to the Crown on the sales of the products of all mines.

As regards coal mining lands:

They are periodically offered for sale by ten-

der or public auction the lands within the "Cascade coal district" at an upset price of \$20 per acre cash, and the lands within all the other coal districts at an upset price of \$10 per acre, cash.

Not more than 320 acres shall be sold to one applicant.

Competition is invited when there is more than one applicant for the same location.

The regulations do not refer to the mining rights under lands already appropriated, or under lands which may be sold in the future not as "mineral lands," but under which mines may at any time be discovered, the mining right in these cases it is to be presumed belongs to the owner of the soil.

#### ONTARIO.

In the Province of Ontario we have the "General Mining Act" (Rev. Stat. 1877, ch. 29), of which the following is a *résumé*:

Any person may explore on any Crown lands not occupied.

Crown lands supposed to contain mines or minerals may be sold as mining locations, or may, when situated within any mining division, be occupied and worked as "mining claims" under "miner's licences."

The dimensions of the mining locations are 320, 160 or 80 acres. The price to purchase them is \$1.00 an acre in the territory north or north-west of the river Mattawa, lake Nipissing and the French River.

The price for the other parts of the province is not stated in the Mining Act but is, I am informed, practically the same.

The "mining claims" have an area of about one acre.

Any person possessing a "miner's licence," renewable annually for a fee of \$5, can occupy and mine one claim only at a time, on condition that it is worked within three months after the registration, and thereafter does not remain more than 15 days unworked.

The discoverer of any new mine shall be entitled to two mining claims.

#### QUEBEC.

In the Province of Quebec the mining rights are dealt with in the "Quebec general Mining Act of 1880" amended in 1881, 1882 and 1884.

The following is a *résumé* of the parts of this act relating to the acquisition of mining properties or mineral rights.

A licence renewable annually (fee \$2) is necessary to prospect on the vacant lands of the province.

The mining rights under all the lands of the province belong to the Crown, even for the lands appropriated before the passing of the act, except when the "lettres patentes" give in full the mining right.

The mining locations are 400 acres or less, but the Lieutenant-Governor in council may increase the limit to 800 acres.

The prices are, surface and mining rights inclusive, \$1 per acre for all minerals except gold, silver and phosphate (apatite), and for these \$2 per acre.

Every person working a gold or silver mining location must take a licence costing \$2 every three months (even if he has bought that mining location).

The owner of the surface, who desires to purchase the right of working a mine under his land, must pay per acre the difference between the rate he has already paid and the rate fixed for mineral lands and as stated above.

In case of gold and silver the "lettres patentes" will only be given after the sum of

\$200 has been expended in working the mine; two years are allowed to do this; but, after that time, if the \$200 are not expended the location may be deemed forfeited.

The Lieutenant-Governor in council may claim a royalty of 2½ per cent on all gold and silver obtained and of 50 cts. per ton for phosphate.

The right to mine, for gold and silver, can also be acquired by licences allowing every person to take up one claim only at a time. These licences are of three kinds, *viz*:—

1. To work under appropriated lands: cost \$1 per month per miner.

2. To work under public lands: cost \$2 per month per miner.

3. To work under mining locations, granted and not being worked, or not granted: cost \$2 per three months.

The dimensions of these "claims" are: for alluvial mines about 100 feet square, and for quartz mining about one acre. They must be worked within four weeks after registration and must not thereafter remain unworked for more than 15 days at a time.

A discoverer has a right to a free licence in force for twelve months and to a claim of the largest size.

The amendments of last year (1884, ch. 22) have recognized the principle of underground rights being separated from the surface rights. They state that underground right may be bought or leased or that they may be acquired by a licence, (the owner of the surface having the first right to acquire); but, the price, the shape and the dimensions of these underground mining locations are not stated. These are to be decided by the Lieutenant-Governor in council.

In considering with attention these *résumés*, it will readily be seen that these laws give the three following results: I. A surface owner possesses or can buy first the mineral rights and is not compelled to work the mine. II. Very large tracts of "mineral lands" can be bought from the Crown lands without any obligations to develop these "mineral lands." In Quebec, however, when these lands are unworked, the Government may grant small claims over them, in the case of gold and silver, but without forfeiting for that the "deeds" of the owner. III. Rights to mine under small claims can also be acquired in certain cases by a licence.

III. The few following remarks may be offered in reference to the system of granting these small claims: it only retards the acquisition of many mines by good companies; it is the cause of a number of disputes on the question of possession of property; and, in some cases, it might cause also the entire spoiling of a good mine. These claims are very much too small and the working of the mines in these cases, being on too small a scale, is never satisfactory. There is nothing really practical in this: and it is only as applied to placer mines that it is good and useful, and this is the only case in which an individual miner can work a mine and make it pay.

I & II. But, it is desired especially, in this report to direct attention to the two first results indicated above of our existing mining laws. The backwardness of our mining industry has been a natural sequence of the recognition by the laws of these systems of giving mining rights to surface owners and of selling "mineral lands;" that alone impedes and even prevents entirely in certain districts the development of the mineral resources; and, until the mining laws are changed and another and entirely different system adopted for the acquisition of mineral



deposits, we shall have, as we have now, but few mines working.

First, indeed, prospecting is discouraged. It is evident enough that the buying up of large tracts of "mineral lands" brings that result, because prospectors are not to be found who will search on granted lands in a vast new country like ours. Surface owners, having mining rights or first rights to acquire, also discourage prospecting, because then, when a mine is found under granted lands, it does not belong to the explorer, to the man who has discovered it, but to a settler who has been working his soil for a long time perhaps, without having ever had any knowledge of the existence of this mine, or to a speculator who, as a rule, has never put his foot on the land. Nevertheless, what right, in justice, have these people to this new property which they did nothing to find and which an explorer brings to light by his exertions after long, patient and very often in this country, tedious research? Suppose it is for instance a vein 2,000 feet long with an average width of 3 feet 4 inches, dipping at a regular angle of 45°, and that the specific gravity of the ore averages 3.5. In these conditions, a simple calculation shows that the vein, being worked to the depth of 1,000 feet and under 23 acres of the surface (2,000 feet on the length of the vein, by a width of 1,000 feet on the side of the dip), will give about 1,000,000 tons of ore. If then a profit of say \$1 per ton can be made on the ore coming from that mine, it is seen that the profit to be made or the real value of the portion of the mine above the depth of 1,000 feet is \$1,000,000. Such is the fortune an explorer has discovered, that he alone indicates and creates, you may say, after perhaps many months or years of arduous tramping. Surely he ought to have some right to a portion at least of that fortune: and yet, the surface owner deprives him of it.

But, if by natural right and law, this property should not belong to the surface owner, it much more ought not to belong to him for political and economic reasons, and for the same reasons, the selling of "mineral lands" ought not to be authorized by our laws. Because, if it tends to lessen the number of discoveries, it also, as second result, prevents the development of the mines once discovered.

A vein, indeed, being discovered on the surface, one must make sure that it keeps going down, that it does not narrow until it becomes unworkable, as is often the case, that the percentage of good ore remains large enough in the vein, that the difficulties of working, due to water or other causes, will not be too great, etc., etc. All this must be known before it can be said that a good mine exists, and to ascertain this, the vein must be explored underground by shafts and levels. This is expensive work, much more so than is generally known, and it may cost many thousands of dollars, always several thousands. It is also a very difficult work, often exceedingly so, and even the best scientific and trained mining engineers sometimes make mistakes, and every mistake costs a great deal of money. Is not then an incompetent man almost certain to make a failure of it? Who is going to do that work of testing the ground? Evidently not the settler, for if he has the misfortune to try it, he will spend every year more money on small excavations sunk in all directions, than the cultivation of his land can yield him, and he never will know how to do the work, and at what results he has arrived, if he arrives at any. The district of North Hastings (Ontario) is pierced everywhere by small excavations such as I have mentioned, sunk by settlers under their lots. I

have visited many of these excavations and in most of them I failed to find a trace of ore, though they represent a large amount of time and money lost, and, many farmers neglect their farms on that account. If the farmer tries to have the work done for him, it will always be on too small scale and is in consequence doomed to failure. He will probably give the work to a so-called "old miner" just arrived from California, Australia and Cornwall. This man knows it all; he will tell the farmer every night that he has done excellent work during the day, that no doubt it is a wonderful mine, that he sees an immense treasure ahead of him in the level or in the shaft, that, true, the expense has been great and nothing has yet been found, but wait, next day he will strike the lead and show him the treasure; and this goes on from day to day until the poor settler is compelled to give it up. And yet, he still believes in his wonderful mine!

It is with the same result generally that the speculator tries to work his lot, his object being only to develop it sufficiently to effect a sale.

Mining engineers and mining men supported by capitalists alone are able to take up these works of newly discovered veins underground exploring. They alone can develop that fortune discovered by the explorer. Why then are these new discoveries allowed to be or to become the property of persons who acquire them either by accident or only for speculative purposes?

If mining is a difficult matter requiring specially trained men; if it is an expensive work requiring a great deal of capital; it is also, so long as a thorough underground prospecting has not been made, a very uncertain business to go into especially in a new country where there is no comparison with neighbouring mines to be made. Mining men know that, they know that a good vein may pass at any moment to a bad one, and in consequence they will never pay, on the evidence merely of the outcrop of a vein, the enormous sums of money asked by the owners of soil. They are willing to run the chances if they have not to pay too high a price for the property: but under the present conditions, they will not try it. They will leave mining districts disheartened, not that they find the district worth nothing, on the contrary, they see there brilliant prospects, but what can they do? They find all the properties bought, all the mining rights acquired and everybody asking them enormous sums, cash, before being allowed even to explore the mine by shafts and levels. And yet this district is very little worked, and though good and discovered many years ago, nothing is to be seen there except shafts full of water and abandoned excavations, remains of the meagre efforts made by the owners of the soil and the speculators to develop their deposits just enough to make a show in order to sell the property.

I may say then, in conclusion, that it is quite necessary in the interests of our country, in the interest of our mining industry which once developed will perhaps give us the millions that our neighbours of the United States have taken out of their mines and on which is based much of their prosperity, that the mining properties should be held as national property regulated by good laws and leased permanently and directly to *bona fide* mining men, on conditions including forfeiture when sufficient work on them is not being annually done.

Why not, indeed, prevent a farmer or speculator from imposing a heavy charge on a mining company willing to run the risks of exploring and working a mine? Why, for what purpose, should the laws place between the government and the real miner, this surface owner, who, with his often primitive and exaggerated ideas of

mines, does not consider the enormous expense and the uncertainty attending the work of underground mineral exploration nor the large capital required for the subsequent regular working of a mine, and will always add to that a formidable demand for money before even allowing explorations to be made on his property; this property having been bought from the Government at \$1.00 an acre and on which he did nothing himself to discover the mine? I say a formidable sum, because I know of many instances where twenty, thirty and even one hundred thousand dollars have been refused by such owners of the surface.

The Canadian government protects many industries, often bonuses are given, the development of our agricultural resources is encouraged: why not also protect our mining industry? To day, before sale, surface rights and mining rights are the property of the country, and the country, in the interest of our mining industry, instead of giving away these rights for a few dollars an acre, should carefully guard the mining right by good legislation, because good mines are rare golden eggs which a nation must protect with great care. A large country like ours, indeed, has so many millions of acres of good lands that land speculation, though very prejudicial, can be overlooked; but, as regards mining, it is very different. Such a thing as "mineral lands" extending over large tracts of country does not really exist; and nature has been more parsimonious with mineral deposits than speculators suppose when they buy thousands of acres in a district thinking they have a mine under every lot. No! good mines, even in a very large country, are always scarce, for geological reasons (mineral deposits geologically being only accidents), for technical reasons (many deposits not being valuable because of the great difficulties of mining them or of treating the ore), for economic reasons (mineral substances being often found too far from market, or from a railway, or being in too small quantity), etc.; then, once a good mine is discovered, its permanent working by a good company should be encouraged and assured. To attain this end, the country must keep the mineral rights in its hands so as to be free, when a mineral deposit is found anywhere, to give the right to mine it to a good company, and if this right is given without charge of any sort before profit is made, it will assure those going to work every possible chance of success and it will encourage capitalists to try and develop every place where the surface indications are good, because the only money to risk will be the necessary money to test the ground. It is but just, however, that the laws should oblige these capitalists, from the day they make a profit, to suitably remunerate the original discoverer. In that way, instead of having thousands and thousands of acres of so-called "mineral lands" bought\* and lying for years and years unprospected, unworked and in no way profitable to anybody, we shall see on the contrary, here and there, some mines actively worked expending vast amounts in the country, bringing workmen in, creating around them villages and towns; and every one of these mines will be more benefit to the Government and to the country than thousands of granted mining locations undeveloped and not only useless from a mining point of view, but doing much damage to the other interests of the country and often to the speculators themselves.

\*See "Plan of part of the North shore of Lake Superior showing Thunder and Black bays, etc.," published in Toronto, 1st August, 1883, (department of Crown Lands), and showing how much "mineral land" is taken up in that region.

As will be seen from the following suggestions which I venture to make in conclusion, nothing could be easier than to change entirely the old system of selling "mining lands" and to attain the results just stated. The national mining property would then be submitted, in its general outlines, to the same kind of administration that has been adopted: in France by the mining law of the 21st April, 1810; in Austria by that of the 23rd May, 1854; in Italy, except in the southern provinces, by the royal warrant of 29th November, 1859; in Prussia by the general mining law of 24th June, 1865; in Bavaria by the law of 20th March, 1869; in Spain by the laws of 6th July, 1859, and 13th July, 1867; in Turkey by the regulations of 3rd April, 1869; and in Greece by the laws of 1861, 1867 and 1877.

PRINCIPLES WHICH SHOULD BE FOLLOWED IN DETERMINING THE CONDITIONS UNDER WHICH MINING RIGHTS SHOULD BE ACQUIRED AND MAINTAINED.

1. Encouragement of explorations:

By recognizing and giving a right to the explorer on the mineral deposit that he discovers. This right should be in proportion to the value of that mineral deposit and consist in consequence in a certain annual royalty on the profits made out of the mine (say 5 per cent of these profits). This rent or royalty will be due every year in which profits are made by the lessee and until the death of the discoverer.

By further giving to the discoverer, if he wish, time to organize a company himself to lease and work the mine—say six months or nine months after the registration of his discovery.

2 Prevention of mere speculating and encouragement for the formation of *bona fide* working mining companies. For that purpose the mining right must be declared entirely independent of the surface right, and this mining right must not be sold, as to do so allows speculators to buy at very low figures large tracts of "mineral lands" which they retain without working them and which they sell only at very high prices; thus delaying the development of our mining industry and hindering the surface and underground explorations; and, the value of our mining districts remains unknown, which is very damaging in an immense new country like ours where the discovery of very rich mining districts may be anticipated every day.

By giving to every one offering sufficient guarantee, when a discovery has been made and when he is first to apply for it, a permanent lease (disposable and transferable as in the case of any other property) of the mining right under the area of land asked for by him, subject however to the following conditions: \*

(a). The lessee shall pay to the discoverer the royalty stated above except if they can agree upon a fixed sum to be paid in the first year of the lease.

(b). To prevent the monopoly of mining rights on too large an extent of lands, larger than can be worked actively to the best interest of the country, that is to say, so as to restrict the areas under which mining rights will be leased to companies within reasonable limits, and to prevent companies from acquiring mining leases simply with the idea of speculating in or selling them at a given time, which would, like the system of today, ruin the mining industry:

The lessee, commencing 6 months after the day of the granting of the lease, shall pay an annual penalty of \$100 per acre of land under which the mineral substance shall not have been

during that year sufficiently worked. Every acre will be considered as insufficiently worked for which an annual average sum of \$100 shall not have been expended. This annual average expenditure will be arrived at in taking into account in the total all expenditure in any work connected with the mine; this total divided by 100 will give the number of acres of the lease sufficiently worked.

Every person having a lease will be permitted to relinquish it on demand, but so long as he retains it he will be subject to the above conditions.

If this penalty (b) is not paid within six months after becoming due the lease shall be considered forfeited.

(c). The lessee shall be entitled and obliged to buy a sufficient area of land necessary for the surface requirements of the mine (plant, offices, dumping grounds, etc.); but, no more than is absolutely necessary if the owner of the soil has no objection; the prices being the ordinary price of the Crown Lands department if on public lands, or being fixed by arbitration, at the ordinary prices of lands in that locality, if on appropriated lands.

(d). All mines shall be subject to inspection by duly appointed officers of the government so as to assure the proper working of the mine according to the conditions of the lease, the preservation of the surface—always endangered by subterranean works;—and also, the safety of mining workmen and the due enforcement of the laws and regulations respecting mines and minerals.

## MINING NOTES

### Nova Scotia.

The Springhill mines, says the *Herald*, continue to boom. The output has now reached 40,000 tons per month, or say at the rate of 50,000 tons a year. We take pleasure in calling the attention of the dismal-doleful organs to the fact that this is only a little less than the total output of Nova Scotia mines a few years ago. The output at Springhill is only limited by the existing capacity to supply.

Some very interesting facts regarding the Londonderry Iron Mines, their failure, and its causes, may be gleaned from the following excerpt taken from a very able review of our iron industry given by the *Montreal Star*:—

In the forests of the Cobequid Hills, in the Province of Nova Scotia, miles away from any road or settlement, a vein of iron ore was years ago discovered. Geologists visited the locality and pronounced the deposits of great extent, and a grant of land was obtained from the Government. A catalan forge was built in 1850, and three years later a small blast furnace was put up, charcoal in both cases was used as fuel, the trees from the forest around being made into charcoal. A small stream ran past the iron mine and was made to drive the blast engine. The iron ore was very pure, so the pig iron made was of superior quality; there was no home market, but it was exported to England, although the iron had to be carted to the nearest shipping point, namely Great Village, six miles away from the furnace, and situated at the entrance to a small tidal river on the Cobequid branch of the Bay of Funday. Navigation on the upper end

of the Bay of Funday is dangerous; the tides which here rise to the height of 71 feet, rush in and out with great rapidity; the river could only be entered at high tide by vessels drawing not more than 12 feet of water, and the navigation to the entrance of the river was bad. The construction of the Intercolonial Railway, which eventually was brought within three miles of the furnace (at the expense of permanently lengthening the main line by five miles, and unfavorably affecting the gradients and curvature) made the place more accessible. It was still only a little hamlet in the midst of the forest, but it was self contained, having plenty of ore and timber for making charcoal. There was a demand for the iron, as owing to its superiority the English War office, upon the recommendation of Sir William Fairbairn and others, were using it for the manufacture of ordnance. This was before the age of steel, and, no doubt, the iron commanded a large price, and, altogether, the works were remunerative to their owners.

In 1873, the Acadia Iron Mines, as they were then called, were purchased by a company of a few English capitalists having Sir William Siemens at their head with a capital of two and a half million dollars. Their intention was to make steel directly out of iron ore by a new patented process, invented by Sir William Siemens and also to make coke, pig iron, etc. This the Steel Company of Canada, had its headquarters in England, and managed the Londonderry business from there. They paid 40,000 in cash and \$60,000 in paid up stock for the Acadia Iron Mines, also \$40,000 for the patent rights, a total of \$1,040,000.

The accidental location of the little charcoal blast furnace seems to have given rise to the choice of the situation for the new works. It would be difficult to account for the selection in any other way. Works specially designed for the new patented process, with rotators, melting furnaces with a regenerative gas producers, two blast furnaces, branch railways to the Intercolonial Railway, and the different ore mines, houses, buildings, etc., etc., were built. The scale on which the expenditures were made can best be understood by reference to the item of cost for the manager's house, which came to \$40,000.

The works were completed and got into operation probably at a further expenditure of about \$1,250,000. The new process did not seem to do very well, and after costly experiments and repeated trials, it eventually proved here, as elsewhere, a complete failure. Hundreds, perhaps thousands, of tons of expensive machinery had to be broken up, and the melting furnaces and regenerative gas producers were pulled down. A second-hand rolling mill was purchased and some puddling furnaces built, an axle forge with a foundry for car wheels an general castings added, and the product of the works changed from steel to pig iron, bar iron and castings. The place was not now self contained as before; charcoal was no longer the fuel used, so the trees were of little use, except for timbers in the iron mines. What was wanted was coal and coke, and although at the time of the purchase, coal was supposed to be on the property, it has never yet been actually discovered. The coal field of Pictou is 51 miles to the eastward, that of Cumberland, 43 miles to the westward. Limestone in considerable quantities is required and is obtained from Brookfield, 25 miles to the eastward. When, after having paid freight on all these materials, iron is made out of them, there is no outlet but by the same Intercolonial railway, the distance by rail to Montreal being 773 miles.

\*That would place a lessee on the same footing as an owner in fee simply would be, excepting the condition of working the property necessary to prevent speculation.

The condition of affairs was bad enough but the situation was made much worse by the fact that the company had never built any coke ovens of their own, and that at this time only one colliery mined a coal suitable for coking, and also owned the only coke ovens in the country, they consequently supplied coke at their own price, helping materially to kill the goose which laid the golden egg. One day an explosion took place in this particular mine, set the mine on fire, and closed it. It has been closed ever since. For a time coke was not to be had for the iron mines at any price, the blast furnaces had to be shut down, and the loss from this cause alone can be better imagined than described. After this experience some coke ovens were built, and to some extent this has made the company independent, finally a coal mine was purchased and fully equipped, but upon practical trials, the coal was found to be to some considerable extent unfitted for their uses. It was also discovered that owing to an arrangement to have their iron ore mined by contract, that the contractor had made money for himself but had permanently ruined one of the iron mines.

Instead of running a general store from which a considerable revenue would accrue, some consideration was granted the privilege and took advantage of.

Is it surprising that after all these vicissitudes and bearing in mind the fact that until 1880 imported pig iron was admitted free of duty into Canada, that the company failed. It is more to be wondered at that they struggled on as long as they did.

In 1880 an import duty of \$2 per ton was imposed, and in 1883 a bounty of \$1.50 per ton of pig iron manufactured out of Canadian ore, was granted by the Dominion Government. Under these improved conditions, the company's operations were continued by the liquidators. It is to be hoped that a re-organization will be effected, the management centred in Canada, and the enterprise made productive to the proprietors and the country at large. Under a careful management, there can be no question that a satisfactory dividend can be earned, upon the expenditure of the works as they stand.

It is manifestly unfair to condemn every projected iron making enterprise in Canada, simply because in the past this particular case has not succeeded. In spite of all their troubles the pig iron, bar iron and other products of the London-derry works have been of a very superior quality and have always commanded the highest price in the market.

### Quebec.

An assay of the ore taken from the Belvedere deposit, in the vicinity of Sherbrooke, has been made by Mr. Hoffman, of the Geological Survey, and is reported to give 28.29 per cent. of metallic iron.

An exchange says the lead mining property on Chate's Island, owned by Captains Cowley and Murphy, was last week sold to Mr. James Robertson of the Montreal Lead Works. Mr. Robertson intends to have the land surveyed into small sections and placed upon the European market without delay. The property contains nearly one thousand acres.

We understand that Mr. F. Stacy Shirley has been appointed manager to the Du Lavee Milling and Mining Company, at Bassin du Lavee, vice Mr. Geo. H. Bacon, resigned. This company, which has been frequently erroneously referred to as Messrs. Bacon & Co., own the Lavee phosphate property, and we learn that the

investors are now taking hold of the mine, and commence active operations at it as soon as the weather will permit them doing so profitably.

Messrs. G. H. Nicholson & Co., of New York, proprietors of the Albert mines, have purchased from the Eastern Townships Bank, together with all the movables, the Hartford and Capel mines. This property was owned and worked for many years by the Canadian Copper and Sulphur Co., Limited, but owing to financial difficulties they were obliged to close down some two years ago and the property was all acquired by the Eastern Townships Bank at sheriff's sale. The new owners will resume operations in the above mines at an early date.

### Ontario.

The London correspondent of the *Montreal Gazette*, mentions two important assays of Canadian minerals having been made, one from the Sudbury copper mines, the other specimen was argentiferous lead ore from the mines of Mr. Edward Wright, situated at Lake Temiscamingue. It was found by dry assay, to contain of lead (metallic) 52 per cent of silver 13 oz. 14 dwts. 10 grs., per ton of ore of 2,240 lbs., or of silver 26 oz. 7 dwts. and 21 grs. per ton of lead of 2,240 lbs. This latter property is now connected with the Canadian Pacific railway by water and by tramway, and it is expected to prove of considerable value.

### THUNDER BAY DISTRICT.

Work has been suspended for the present at the Elgin mine.

It is understood that negotiations for the sale of Silver Mountain West End property will soon be concluded.

An air compressor, capable of driving three drills, is in course of erection at the East End Silver Mountain mine.

The shaft at the Partridge Rock Silver Mine is now down about thirty feet. The indications for silver are reported to be most encouraging.

The *Miner* reports that a big strike of rich ore has been made at the Beaver mine. It has been made in the drift, beyond the shaft about 150 feet, and is of almost unexampled richness. About 350 pounds of ore have been brought into town which will assay from 1,000 to 2,000 oz. to the ton. The vein has been laid bare for about 18 feet of its depth and for about 400 feet long; it shows not 7 feet wide, and is uniformly as good as the samples all the way across.

The following are the directors of "The Consolidated Huronian Gold Mining Company of Ontario":—Horace J. Neville, G. A. Thompson and Alexander McEwan, of London, England; A. R. Gray, Edinburgh, Scotland; James McLaren, Buckingham, Quebec; J. A. Keefer, Port Arthur; and N. Kingsmills and A. J. Cathanact, Toronto. The capital stock is \$1,300,000, with an additional working capital of \$500,000. The head office of the new company will be at Port Arthur.

### Manitoba and North-West Territories.

A member of the Geological Survey staff who has been engaged during the past season in the work of investigating the coal deposits of the Saskatchewan region states that the coal supply of the North-West is absolutely inexhaustible, and

that the whole district lying between Rocky Mountain House and Fort Pitt is one vast series of coal beds, both hard and soft, of the very best quality.

In the last Canada Gazette notice is given that Duncan McArthur, W. R. Allan, F. A. Fairchild, R. D. Bathgate, Archibald Wright and C. W. Betts, all of Winnipeg, apply to the Governor-in-Council for letters patent incorporating such applicants a body corporate and politic under the corporate name of "The Rocky Mountain Mining and Lumbering Company (Limited)," for the purpose of carrying on a mining and lumbering business within the Dominion of Canada, also for the purpose of said company, to build, equip and operate tramways, sailing and steam vessels for the carriage of lumber, timber, minerals or mineral ores or any other production by said company; to purchase, build and erect stamp mills, saw and planing mills, or any one or more thereof. The head office of the company will be at the City of Winnipeg.

Work is being actively pursued at the Saskatchewan coal mine. Some difficulty has been experienced owing to the scarcity of miners. The Hungarians who had been employed were found to be worthless, and had to be discharged, and operations are now being carried on by miners imported from Nova Scotia, who are working on a percentage. The present staff employed is 71 men and the daily output is 75 tons. The capacity of the mining machinery is 260 tons per diem, and as soon as the management can place their full staff to work, this is expected to be their daily output. Mr. W. M. Caldwell, of the firm of Caldwell & Keenan, under whose superintendance the work of development is being carried on, states that when they began work the mine had been neglected for about eighteen months, and it was covered with water to the depth of from 16 to 18 inches. The old company sank their shafts at the base of the hill under which the mine is, and did not work more than from twenty to thirty-five feet of cover. He had, however, run two shafts right under the hill and they are now working under a cover of two and three hundred feet. So far the shafts have run in 370 feet, and they are steadily going forward. He states that as they get deeper and deeper into the earth the coal continues to improve in quality.

### British Columbia.

Mining operations in the Kootenay district have been suspended for the winter.

In another column is given a copy of Mr. G. A. Koch's report to the directors upon the mining property belonging to the British Columbia Milling and Mining Company.

A quartz nugget taken from Granite creek was recently sold to Mr. I. B. Fisher, of the Bank of British Columbia, New Westminster. It weighed 34 ounces, and after allowing 40% for quartz, is valued at \$340.00.

Work has been begun by awarding the contract for grading the site of the shaft house, and sinking 50 feet on the vein from the surface, to connect the present blind shaft, which is down fifty feet from the end of the tunnel, developing the vein 105 feet from the surface, where it cross cuts in the ledge, showing a vein of 23 feet in width between walls.

This Company, says the *Colonist*, was organized in 1878, during the quartz mining excitement, secured several locations on the Bonanza lode in Cariboo, near William's creek, and laid down at a cost of some \$75,000 a complete twenty stamp mill, rock crusher and sawmill. After the general collapse, which occurred in the fall of that year, caused by an undue inflation of mining stocks before any development had actually commenced, the company, feeling that further assessments upon the stockholders would be fatal to the interest of the enterprise, decided upon shutting down, preserving their machinery, and protecting their claims for further operations, when a more propitious state of mining affairs would warrant development, the directors and shareholders having every confidence in the value of their property and the ultimate success of the enterprise. The Directors of the Company, which possesses 4,500 feet on the Bonanza vein, known as the St. Laurent, American and Cariboo claims, and 1,500 feet on the Wilkinson, are: President, Mr. Joseph Heywood; Secretary, Mr. Geo. A. Sargison; and Messrs. J. H. Todd, J. H. Turner, C. E. Redfern, I. Oppenheimer, and Frank Barnard.

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# MINING REGULATIONS

## To Govern the Disposal of Mineral Lands other than Coal Lands, 1886.

THESE REGULATIONS shall be applicable to all Dominion Lands containing gold, silver, cinnabar, lead, tin, copper, petroleum, iron, or other mineral deposits of economic value, with the exception of coal.

Any person may explore vacant Dominion Lands not appropriated or reserved by Government for other purposes, and may search therein, either by surface or subterranean prospecting, for mineral deposits, with a view to obtaining under the Regulations a mining location for the same, but no mining location or mining claim shall be granted until the discovery of the vein, lode, or deposit of mineral or metal within the limits of the location or claim.

### QUARTZ MINING.

A location for mining, except for iron, on veins, lodes, or ledges of quartz or other rock in place, shall not exceed forty acres in area. Its length shall not be more than three times its breadth, and its surface boundary shall be four straight lines the opposite sides of which shall be parallel, except where prior locations would prevent, in which case it may be of such a shape as may be approved of by the Superintendent of Mines.

Any person having discovered a mineral deposit may obtain a mining location therefor, in the manner set forth in the Regulations which provide for the character of the survey and the marks necessary to designate the location on the ground.

When the location has been marked conformably to the requirements of the Regulations, the claimant shall, within sixty days thereafter, file with the local agent in the Dominion Lands Office for the district in which the location is situated, a declaration or oath setting forth the circumstances of his discovery, and describing, as nearly as may be, the locality and dimensions of the claim marked out by him as aforesaid; and shall, along with such declaration, pay to the said agent an entry fee of FIVE DOLLARS. The agent's receipt for such fee will be the claimant's authority to enter into possession of the location applied for.

At any time before the expiration of FIVE years from the date of his obtaining the agent's receipt, it shall be open to the claimant to purchase the location on filing with the local agent proof that he has expended not less than FIVE HUNDRED DOLLARS in actual mining operation on the same; but the claimant is required before the expiration of each of the five years, to prove that he has performed not less than ONE HUNDRED DOLLARS' worth of labor during the year in the actual development of his claim, and at the same time obtain a renewal of his location receipt, for which he is required to pay a fee of FIVE DOLLARS.

The price to be paid for a mining location shall be at the rate of FIVE DOLLARS PER ACRE, cash, and the sum of FIFTY DOLLARS extra for the survey of same.

Not more than one mining location shall be granted to any individual claimant upon the same lode or vein.

IRON. - The Minister of the Interior may grant a location for the mining of iron, not exceeding 160 acres in area, which shall be bounded by north and south and east and west lines astronomically, and its breadth shall equal its length. Provided, that should any person making an application purporting to be for the purpose of mining iron there obtain, whether in good faith or fraudulently, possession of a valuable mineral deposit other than iron, his right in such deposit shall be restricted to the area prescribed by the Regulations for other minerals, and the rest of the location shall revert to the Crown for such disposition as the Minister may direct.

The Regulations also provide for the manner in which land may be acquired for milling purposes, reduction works, or other works incidental to mining operations.

Locations taken up prior to this date may, until the 1st of August, 1886, be re-marked and re-entered in conformity with the Regulations without payment of new fees, in cases where no existing interests would thereby be prejudicially affected.

### PLACER MINING.

The Regulations laid down in respect of quartz mining shall be applicable to placer mining as far as they relate to entries, entry fees, assignments, marking of localities, agents' receipts, and generally where they can be applied.

The nature and size of placer mining claims are provided for in the Regulations, including bar, dry, bench, creek or hill diggings, and the RIGHTS AND DUTIES OF MINERS are fully set forth.

The Regulations apply also to

### RED-ROCK FLUMES, DRAINAGE OF MINES AND DITCHES.

THE GENERAL PROVISIONS of the Regulations include the interpretation of expressions used therein; how disputes shall be heard and adjudicated upon; under what circumstances miners shall be entitled to absent themselves from their locations or diggings, etc., etc.

### THE SCHEDULE OF MINING REGULATIONS

Contain the *forms* to be observed in the drawing up of all documents, such as: - "Application and affidavit of discoverer of quartz mine." "Receipt for fee paid by applicant for mining location." "Receipt for fee on extension of time for purchase of a mining location." "Patent of a mining location." "Certificate of the assignment of a mining location." "Application for grant for placer mining and affidavit of applicant." "Grant for placer mining." "Certificate of the assignment of a placer mining claim." "Grant to a bed-rock flume Company." "Grant for drainage." "Grant of right to divert water and construct ditches."

Since the publication, in 1884, of the Mining Regulation to govern the disposal of Dominion Mineral Lands, the same have been carefully and thoroughly revised with a view to ensure ample protection to the public interests and at the same time to encourage the prospector and miner in order that the mineral resources may be made valuable by development.

COPIES OF THE REGULATIONS MAY BE OBTAINED UPON APPLICATION TO THE DEPARTMENT OF THE INTERIOR.

**A. M. BURGESS,**

*Deputy Minister of the Interior.*



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At this quarry there is an inexhaustible supply of most beautiful white marble. Samples to be seen and information obtained at the office of the Mining Review.



**DEPARTMENT OF INLAND REVENUE.**

AN ACT RESPECTING AGRICULTURAL FERTILIZERS.

**T**HE public is hereby notified that the provisions of the Act respecting AGRICULTURAL FERTILIZERS came into force on the 1ST of JANUARY, 1886, and that all Fertilizers sold thereafter require to be sold subject to the conditions and restrictions therein contained—the main features of which are as follows:—

The expression "fertilizer" means and includes all fertilizers which are sold at more than TEN DOLLARS per ton, and which contain ammonia or its equivalent of nitrogen, or phosphoric acid.

Every manufacturer or importer of fertilizers for sale, shall, in the course of the month of January in each year and before offering the said fertilizer for sale, transmit to the Minister of Inland Revenue, carriage paid, a sealed glass jar, containing at least two pounds of the fertilizer manufactured or imported by him, with the certificate of analysis of the same, together with an affidavit setting forth that such jar contains a fair average sample of the fertilizer manufactured or imported by him, and such sample shall be preserved by the Minister of Inland Revenue for the purpose of comparison with any sample of fertilizer which is obtained in the course of the twelve months then next ensuing from such manufacturer or importer, and which is transmitted to the chief analyst for analysis.

If the fertilizer is put up in packages, every such package into deal for sale or distribution within Canada shall have the manufacturer's certificate of analysis placed upon or securely attached to each package by the manufacturer; if the fertilizer is in bags, it shall be distinctly stamped or printed upon each bag; if it is in barrels, it shall be either branded, stamped or printed upon the head of each barrel, or distinctly printed upon good paper and securely pasted upon the head of each barrel, or upon a tag securely attached to the head of each barrel; if it is in bulk, the manufacturer's certificate shall be produced and a copy given to each purchaser.

No fertilizer shall be sold or offered or exposed for sale unless a certificate of analysis and a sample of the same shall have been transmitted to the Minister of Inland Revenue, and the provisions of the foregoing subsection have been complied with.

Every person who sells, or offers or exposes for sale, any fertilizer, in respect of which the provisions of this Act have not been complied with, or who permits a certificate of analysis to be attached to any package, bag or barrel of such fertilizer, or to be produced to the inspector, to accompany the bill of inspection of such inspector, stating that the fertilizer contains a larger percentage of the constituents mentioned in sub-section No. 11 of the Act than is contained therein, or who sells, offers or exposes for sale any fertilizer purporting to have been inspected and which does not contain the percentage of constituents mentioned in the next preceding section, or who sells, offers or exposes for sale any fertilizer which does not contain the percentage of constituents mentioned in the manufacturer's certificate accompanying the same, shall be liable in each case to a penalty not exceeding fifty dollars for the first offence, and for each subsequent offence to a penalty not exceeding one hundred dollars. Provided always, that deficiency of one per centum of the ammonia or its equivalent of nitrogen, or of the phosphoric acid, claimed to be contained, shall not be considered as evidence of fraudulent intent.

The Act passed in the forty-seventh year of Her Majesty's reign, chaptered thirty-seven and intitled "an Act to prevent fraud in the manufacture and sale of agricultural fertilizers," is by this Act repealed, except in regard to any offence committed against it or any prosecution or other act commenced and not concluded or completed, and any payment of money due in respect of any provision thereof.

A copy of the Act may be obtained upon application to the Department of Inland Revenue.

E. MALL,

Commissioner.



**Tenders for a License to Cut Timber on Dominion Lands in the Province of British Columbia.**

**SEALED TENDERS** addressed to the undersigned, and marked "Tender for a Timber Berth," will be received at this Office on Monday, the 1st day of November next, for four timber berths of ten square miles each, more or less, numbered respectively 4, 5, 8 and 9, situated on Kicking Horse River, and Otter Tail Creek, a tributary of the Kicking Horse River, near Field and Otter Tail Stations, on the line of the Canadian Pacific Railway, in the Province of British Columbia.

Sketches showing the position, approximately, of these berths, together with the conditions on which they will be licensed, may be obtained at this Department or at the Crown Timber Offices, Winnipeg, Calgary, N.W.T., and New Westminster, British Columbia.

A. M. BURGESS,

Deputy of the

Minister of the Interior.

Department of the Interior,

Ottawa, 11th August, 1886.



**Tenders for a License to Cut Timber on Dominion Lands in the Province of British Columbia.**

**SEALED TENDERS** addressed to the undersigned, and marked "Tender for a Timber Berth," will be received at this Office up to noon on Wednesday, the 1st day of December next, for three timber berths of fifty square miles each, more or less, numbered respectively 16, 17 and 18, situate on the west side of the Columbia River, near Golden Fire Station, on the line of the Canadian Pacific Railway, in the Province of British Columbia.

Sketches showing the position, approximately, of these berths, together with the conditions upon which they will be licensed, and the forms of tender therefor, may be obtained at this Department or at the Crown Timber Offices at Winnipeg, Calgary, N.W.T., and New Westminster, British Columbia.

A. M. BURGESS,

Deputy of the

Minister of the Interior.

Department of the Interior,

Ottawa, 9th September, 1886.

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