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MINING REVIEW

VOL. 4.—No. 7.

1886—OTTAWA, OCTOBER—1886

VOL. 4.—No. 7

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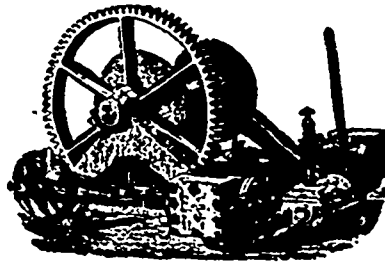
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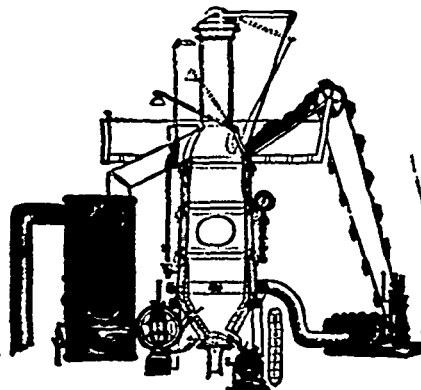
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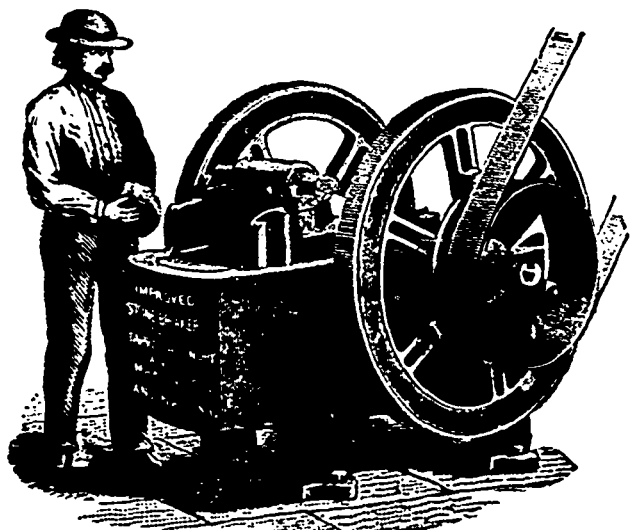
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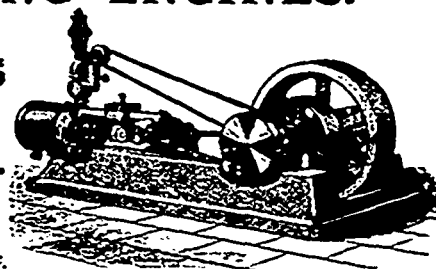
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Persons desirous of tendering are requested to make personal enquiry relative to the work to be done, and to examine the locality themselves, and are notified that tenders will not be considered unless made on the printed forms supplied, the blanks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

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 does not bind itself to accept the lowest or any tender.

By order,
 A. GOBEIL,
 Secretary.

Department of Public Works,
 Ottawa, 20th Sept., 1886.

Notice to Contractors.

SEALED TENDERS addressed to the undersigned, and endorsed “Tender for Breakwater, Port Arthur,” will be received until FRIDAY, the 5th day of October next, inclusively, for the construction of a further length of

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according to a plan and specification to be seen on application to Mr. W. F. Davidson, Harbour Master, Port Arthur, and at the Department of Public Works, Ottawa, where printed forms of tender can be obtained.

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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.

The death is announced of Mr. John Kelly, Deputy Commissioner of Mines for the Province of Nova Scotia. The late gentleman who was much respected has occupied this position for nearly a quarter of a century. Mr. Charles Carman, the deceased deputy's chief clerk, is highly spoken of as his probable successor.

At the annual meeting of the Iron and Steel Institute held in London on the 6th inst., President Piercy, the retiring officer, delivered an address on the iron and steel resources of Great Britain and the United States, and pointed out that British production of Bessemer Steel is rapidly decreasing.

We have observed with much satisfaction signs of improved methods being adopted for the development of our mining industry. During the past year substantial progress has been made. Our iron, copper, silver, gold, apatite, asbestos and salt deposits present a field for enterprise which has been too long neglected, and with the union of capital and skill we may confidently hope for the development of these resources, which, in the near future, will form not an unimportant part in advancing the welfare of the country.

At a great demonstration of miners held recently in the west of Scotland, a resolution was submitted regretting the continuance of low prices and consequent low wages; the evasions of the Truck Act, so common in the country, were strongly denounced and energetic measures to suppress the evil were called for. The reso-

lution also sought for the establishment by law of an eight hours day for underground workers. There was a considerable degree of earnestness and enthusiasm shown by the men, and the various speakers were warmly cheered when they referred to the hardships of the miners' lot and indicated the means by which it might be improved.

Nothing, remarks our esteemed contemporary the *Engineering and Mining Journal*, is more surprising than the tonic and strengthening effect of salt water or even a sea breeze on a gold or silver mine. A poor puny prospect-hole out west has only to cross the Atlantic once, and by the time it reaches London it is a "strong" and "healthy" lode, "mineralized throughout," full of "great strikes," and stronger and richer the deeper it is followed. From the merest shadow of a mine that would not yield "grub" to the industrious and abstemious Western miner, the sea air has invigorated it to such an extent that it not only can pay the liberal board of distinguished "guinea-pigs," but it promises a profit of from 20 to 50 per cent. on several million dollars of the worthy investors. We have not noticed that any physico-mineralogico-medical authorities have heretofore called attention to this curious and important phenomenon.

We continue to experience much difficulty in collecting correct statistics and other reliable facts in connection with mining operations in the Dominion; not that the information has been refused us in any case, but owing to the nature of it the owners and managers of mines neglect to furnish us with the particulars we desire. They appreciate the value of publishing reports of the mining industry, and wherever personal visits have been made they have been found willing to give details relating to the progress made, number and wages of employees, quantity and value of output, &c., &c. But while a personal visit to the various mines is desirable—and for gaining a proper knowledge of the industry, local observation and enquiry are occasionally essential—it is an expensive mode of ascertaining facts, and the great distances to be travelled in order to make a complete round of the mining centres of the Dominion would necessitate our employing a staff of representatives which we could not support. The progress of our mining industries is a subject in which the country at large has a deep interest, and the time has arrived when it has become necessary to organise a Bureau of Mines, in connection with the Geological Survey, with authority to make the supply of information compulsory.

Mining in Ontario is certainly growing in importance, though much more slowly than the extent and richness of her mineral deposits would warrant. Mr. A. Blue, Secretary of the Bureau of Industries, in his annual report to the Commissioner of Agriculture, declares that throughout the mining districts of the province,

as in the United States, speculation has been far more active than business enterprise, and adds: "It is easier to place a mine in the market for a million dollars than to sell it for a hundred thousand." The methods adopted for working mines have been, on a small scale, precisely the same as those pursued in the United States, on a large scale. The money required for prosecuting mining operations has been ventured in the hope of realising a speedy fortune from the discovery of a bonanza; operations are marked by rashness and extravagance, and too often end in disappointment and failure. In other words, plans are seldom laid with a view to the remote future, the desire being to produce the largest amount of bullion in the shortest time possible. The same experience is referred to by Mr. Clarence King, in the United States Census Report, recently issued. He says, after referring to the stability and steadiness of the mining industry in some foreign countries, "an engineer in this country is hardly to be blamed if he plans for the immediate present; on the one side he is pressed by the stockholders, clamorous for speedy profits, and on the other hand he realizes that the chances for a long period of bonanza are slight. His policy is forced upon him. He aims to secure given results by the most direct means, and when the object has been attained he cares little whether his drifts cave, and the structures over his hoisting works and mills fall in, if they have served their purpose." This, says Mr. Blue, is the record of Silver Islet, and East Silver Mountain, in the Province of Ontario, one of which has yielded millions of ore, and the other nothing beyond a rich surface show.

Insoluble Phosphate.

The following letter has been recently addressed to a gentleman in the Southern States by N. B. Powter, Esq., manager in New York of the Grand Cayman's Phosphate Co., of Kingston, Jamaica, W. I.:

MY DEAR SIR,—

You ask "why does the insoluble phosphoric acid in the natural West Indian Guanos give good results when sown with potash and ammonia, when the insoluble phosphoric acid in Charlestown floats, Canadian apatite, navassa and other rocks give no results although applied in a much finer state of division than the West Indian Guanos?"

In reply, allow me to state that the solubility of the phosphoric acid depends on two great points.

First: The amount of volcanic heat to which they have been subjected. For instance, apatite is the most insoluble of all forms of phosphate rock, and the most perfectly crystallized by volcanic heat. Then, next, those rocks which have been only partially crystallized, such as Charlestown rock, Navassa, Connetable, Swan Islands, phosphate of alumina from Germany, France, and Spain, and many others. But the natural fertilizers from the low lying islands, which all show that they are water formations and have never been subjected to any heat are very few in number and of small extent, and most of them so low in grade as not to pay to mine and ship.

Those best known here are Orchilla, Mona, Flamingo, Vivorilla (exhausted), Cay Avola (exhausted), Morant cays (exhausted), and now we offer the Grand Cayman's phosphatic guano, only recently discovered and of large extent. And this is the only natural guano which is a compound of phosphate of lime, phosphate of alumina, and phosphate of iron, and these ingredients add much to its value as they help more on soils where the simple carbonaceous guanos have but little effect, such as marls and limes.

Secondly: The natural guanos are themselves soils which have been acted upon through a great length of time by the air, water, and action of vegetation. The mechanical condition is thus naturally suited to plant life, whereas the crystallized rocks before mentioned are often in great masses, as in connetable, the apatites, &c., &c. or are covered up in beds and pockets as in the Charlestown beds, Navassa, &c., &c., and are entirely useless in their present state for plant food.

Hence, although all are classed as insoluble phosphates by the chemists because they will not dissolve in water. Yet the natural guanos are all more or less soluble in citrate of ammonia solutions, and are fit for plant food as much so as the reverted phosphoric acid which is in the acid phosphates made from Charlestown rock, apatite, &c., &c.

Such being the case, I warn you not to be led astray by the statement that the insoluble phosphoric acid in Charlestown floats is as good as the natural guanos, for it has been proved over and over again that floats from Charlestown rock, apatite and navassa give no results, and as proved by the Georgia State experiments often make an actual loss.

I am, yours truly,
(Signed), N. B. POWTER.

[We publish the foregoing letter with the permission of its author, in order that our readers may have an opportunity to criticise in these columns the statements Mr. Powter makes. We have not the slightest doubt that he implicitly believes all the theories he advances, and in the interest of the Company he represents it is well that he should: on the other hand we have had the most positive assurance that experiments which from time to time have been made with Canadian apatite in its raw state have proved it to be very useful as a plant food the second year, and frequently the first year, after application.—Ed.]

The Phosphate Trade.

The first shipment of Canadian phosphate went forward from Montreal on May 12th consigned to Hamburg, and since that date shipments have been irregular, due chiefly to the unsettled state of the British and European fertilizer markets, and the unusual fluctuations in ocean freight rates which have varied from five to twelve shillings per ton, and at this last high rate some of the later lots have gone forward. The market abroad has been in a stagnant condition during the past nine months and values have been reduced to 11d. per unit. for 80 per cent. phosphate, and with ocean freight at 8 to 12 shillings it is not to be wondered at that mine owners look upon the season's business with dissatisfaction. Notwithstanding this unfavorable state of things, viz.: reduced values and higher freights, there has been a fair amount of business done, which, however, must have proved

unremunerative to sellers.

Mine owners continue confident that there will be an early revival in the fertilizer trade and that better prices will be realized next season. This opinion is endorsed by dealers on the other side who report that indications of a re-action are already noticeable and predict an active market with the opening of navigation of 1887. Some of the producers have been averse to forwarding their output under the unfavourable conditions which have characterized the season's operations, and those of them who can afford to carry over until next year are wise if they have done so.

There has been no apparent relaxation in the activity at the mines; on the contrary, work has been carried on energetically throughout the past summer, and preparations are being made for continuous active operation during the winter.

The DuLievre Phosphate Milling Company have been much encouraged by the flattering letters they have received from customers, attesting to the excellent quality of their ground phosphate which they have received and used during this season. Shipments aggregating about 600 tons have been made to Boston, Buffalo, Detroit, Chicago and St. Catherines, and in every instance consigners have expressed themselves highly pleased, and affirm that they can use this grade of fertilizer to better advantage and with more satisfactory result than they have been able to obtain from South Carolina rock which they have been in the habit of using.

The demand for this ground phosphate will certainly expand, as there is every reason to believe that a large percentage of each year's production will be sold in this form, and that its principal market will be the northern United States. When such a market has been established it will very materially stimulate the Canadian phosphate mining industry.

We are not yet in receipt of a statement of phosphate shipments to date, but there is no doubt that the quantity which has gone forward for the season is considerably less than last year. Before our next issue will appear, the shipping season will have closed, and the November number of the REVIEW will contain a detailed statement of the year's output, and of all shipments for the season of 1886.

Asbestos Mining in Canada.

This industry is rapidly expanding in the Eastern Townships, and with the assistance of capital, and skilled labor it will assume larger proportions year by year. During the season of 1886, up to date, there has been greater activity noticeable at the mines than in any former year, and the result has been a marked increase in the production. The market, too, has been fairly brisk, and the demand abroad for Canadian asbestos is steadily increasing, as we find it to be superseding the Italian almost entirely.

Values have been steady during the year, and remain so, prices ranging from \$80 to \$50 per ton (2,000 lbs.), according to quality. A portion of this season's output is yet unsold although some of the most extensive operators have orders ahead for all they can produce up to the end of the year at current prices.

The Anglo-Canadian Asbestos Company (limited), are getting their mine at Black Lake well opened up, and will soon be in a position to largely increase their output. The steam drills, and air compressors which they put in last winter have given great satisfaction, and will ultimately tend to greatly facilitate mining operations.

The Scottish-Canadian Company, whose mine

is also situated at Black Lake, are preparing to put in machinery with a view to increasing their operation which are now under the superintendence of Mr. Chas. Lionais.

The Thetford mines, which are worked to a greater depth than has yet been reached at Black Lake, are still operated entirely by hand labor. In consequence of the greater depth from which the asbestos is taken at the mines in Thetford, the output is more uniform in color than that of the other mines of the district whose surface output requires to be classified as 1st and 2nd quality. The Black Lake mines are looked upon with much favor for future, and more extensive working, and when greater depth has been reached their product will unquestionably be of the highest grade. New uses for asbestos are being constantly discovered, but it is difficult to obtain accurate information in this connection until such discoveries have been worked out, and perfected, and but a small percentage of them prove of any practical value.

The output of the Canadian asbestos mines for this year, up to date, will aggregate about 2,000 tons, 500 tons in excess of last year's production for the entire season, and is made up approximately as follows:

	Tons.
Anglo-Canadian Company, Black Lake	400
Scottish-Canadian Company,	200
Boston Asbestos Packing Company, Thitford	400
Johnson Company, Thitford	375
King Bros. & Company, Thitford	175
Ward & Company, Thitford	150
Jeffery & Company, Danville	200
Desultory mining, say	100
Total,	2,000

Coal in New Zealand.

In a recent report presented to the New Zealand House of Representatives by Mr. Larnach, the Minister for Mines, it is stated that in 1878 the total output was only 162,218 tons, but in 1884 it had reached 484,831 tons, and last year 511,063 tons. The consumption of the colony is still, however, in excess of the home production, and in 1885 130,202 tons were imported. The number of workings at present in operation in New Zealand is 95, and the output per man 345 tons per annum. Last year there was a strike at one of the mines, which resulted in a loss of production of 36,000 tons. In two cases the shafts reach a depth of 1,600 feet, and at that point the seam is from 17 feet to 18 feet in thickness. The industry is being conducted with a good deal of energy and enterprise, the best machinery being used, and it is hoped that before long the export of coal from New Zealand to the other Australasian colonies will assume some importance. It is acknowledged, however, that for a long time to come agricultural and pastoral industry will naturally claim priority in the application of capital and labour to the natural resources of the country.

The recent inquiries into the dangers of blasting have served to stimulate invention in the direction of mechanical "coal-getters." Several promising devices have lately been brought to notice of colliery owners in England and on the continent. Some of these are now undergoing the test of actual work. In the Westphalian mines particularly, attention is given to such machines, two or three of which have already won their way into favour. Foremost among these is that of Herr von Walcher. This apparatus, says Mr. George G. Andre, in the *Colliery Guardian*, is in regular use in three important collieries, from each of which have been received a highly satisfactory report of its working.

COPPER IN ONTARIO.

Extensive Deposits Near Sudbury.

DEVELOPMENT WORK BEING VIGOROUSLY PUSHED WITH MOST SATISFACTORY RESULTS.

So much has been written within the past few weeks in the *press* regarding the copper deposits in the vicinity of Sudbury, and the reports have varied so vastly as to facts, that we will endeavour now to give our readers the benefit of the information we have been able to gather from other reliable sources as well as from a representative of the *Review* who has quite recently visited the locality in question with a view to arriving, as nearly as possible, at the facts as they actually exist.

The main lode, carrying yellow Sulphuret of Copper ore, has been traced by surface croppings for a distance of about four miles and extends from lot 5 in the 1st concession of the Township of Blezard, known as Stobie, or Mineral Hill location, south-westward to lot 2, in the 12th concession of McKim, known as Copper Cliff location. Another lode appears on the lot 11, in the 5th concession of McKim, about five miles from Sudbury, where it is crossed by the main line of the Canadian Pacific Railway.

THE FIRST DISCOVERY OF COPPER

in the district, according to a report by Mr. Blue, Secretary of the Ontario Bureau of Industries, was made at this point at the time of the construction of the railway. The deposit extends south-ward and east-ward until it joins the main lode of Copper Cliff, and on it are the McConnell and Fly Lake locations. Some prospecting has been done on these properties, but the only actual development work has been at Copper Cliff.

Mineral Hill location, about four miles north-east of Sudbury, was discovered and taken up by Mr. W. Stobie, in August, 1885. Here an opening has been made on the lode from the foot to the top of the hill on its south-east side and a test pit sunk to sufficient depth to reveal good ore. Proceeding south-westward, for a half mile or so, the Exposed Hill's location is reached, on lots 6 and 7 in the 6th concession of McKim, which comprises eight hills, extending along the north-west side of the north branch of Sudbury Creek, and embracing 6,500 feet on the lode. From both the Exposed Hills and Mineral Hill claims a fair quantity of ore has been taken out, and the assays have been very satisfactory. A line of railway has been surveyed for the main line of the Canadian Pacific Railway which will serve both these locations.

The Murray location, the property of Thomas Murray, M.P.P., of Pembroke, is crossed by the railway and shows out croppings of ore along its whole extent. Nothing has yet been done towards developing this claim, although this portion of the lode is regarded as very rich in copper.

On the McConnell location, which is on the same ridge as the Murray, two test pits have been sunk, penetrating bodies of high grade ore. To the eastward of the McConnell claim, two pits have been sunk on the Fly Lake location, lot 1, concession 3, of Snider township, the result of which has been to expose a sufficiently important ore body to induce the Canada Copper Company to pay \$13,000 for the entire claim, comprising about 1,800 acres.

THE CANADA COPPER COMPANY

is composed of wealthy United States and Canadian capitalists, and has been organized by Mr. Ritchie, of Akron, Ohio, President of the Central Ontario Railway. This company has already acquired the Copper Cliff, Fly Lake, McConnell, Mineral Hill, and one of the Exposed Hills locations, and will vigorously prosecute mining operations as soon as transportation facilities have been arranged by the construction of branch lines of railway. Already five locations on the main lode have been partially developed, one of which, the Copper Cliff, is now being extensively worked by the Canada Copper Company by means of open quarry work, which has been driven forty feet into the face of the hill, at a point where the vein is about fifty feet wide. About one hundred men are now employed, and owing to the very favourable position of the deposit at this point the ore can be raised at small cost, and in large quantity. Quite 2,000 tons of ore are now on the dump awaiting shipment, and the company is forwarding about 15 car loads daily to the smelting works in New Jersey. It is thought that ultimately the output of copper ore from this locality will find its way to Cleveland, and Detroit, as the reduction in freight rates to those points would be an important item. The distance by rail to Lake Huron is but 70 miles, from whence it can be shipped in ore vessels direct to the smelters. It is not unlikely that furnaces will eventually be erected in proximity to the mines, and the ore smelted there, and in the interest of the industry it is very important that some determined step should be taken in this direction.

The mineralized portion of the main lode in the Sudbury district is composed of yellow Sulphuret of Copper, (copper pyrites) intersected by strings of galena, and at some points measure from 30 to 60 feet in width of high grade of ore which will probably yield 8 to 15 per cent. of Metallic copper. Although these figures are infinitely below those which have been published, anyone familiar with the history of the world will readily agree with us in the opinion that if the above data can be relied upon as the average character of the Sudbury lode, it will develop into a mine, or a number of mines, of gigantic proportions and unlimited capabilities.

Revival of the Mining Industry.

We are indebted to the *Engineering and Mining Journal* of the 2nd for the following:—"The great revival in business that has fairly taken root in this country has a more healthy tone and better prospect for enduring than the spurt we had a year ago. At that time, as we pointed out, every branch of business was lifeless throughout Europe, and so closely connected are countries to-day that no one can long enjoy great prosperity while the others are suffering from business stagnation. Our present active business is accompanied with a decided improvement and a better outlook in every European country. There is, consequently, good ground for the belief that we have fully entered upon a great wave of universal prosperity that will carry us forward for a few years at least.

We are not admirers of 'booming,' and we hope the present business activity may continue to increase at such an even and temperate rate that the wild excitement and violent fluctuations that are the symptoms of 'booming' may not be seen. A more active interest in mining and a greater desire to invest in mineral property have been very noticeable for some time past. We

are also advised from London that a real 'boom' has come over phlegmatic cousin John, and nothing is talked of but the great gold strike in the Transvaal, South Africa. It is said that the mine produces large amounts of seven-ounce rock. If this be so, it will go hard with the Boers to hold their country, and whatever the rest of the world may gain, they will probably lose.

But as 'one swallow does not make a summer,' so one find of seven-ounce ore does not create a rich mining country, though it is sufficient to excite the average London mining broker. The example of the Indian gold mines, in which so many millions have been sunk on the fortunate accident of finding one, but only one paying mine, the Mysore, among the vast number of prospects sold at the prices of good mines, makes it probable that a fresh lot of good money will go out from that great paradise of worthless mine vendors. It is safe to predict its principal return will again be the valuable but unheeded experience that prospects are not mines; that an investment in the shadow of a neighboring bonanza is the most unsubstantial of values; that the prospectuses prepared by London 'promoters' are generally works of pure imagination and financial will o' the wisps; and that no public mining investment is worthy of attention unless the value of the property has been ascertained and is vouched for in detail by competent, disinterested and honest experts.

But it is not our province to warn Englishmen of the shoals and quickstands that surround Indian and African mining speculations. Nor is it possible for us to buoy every sunken reef that will wreck so many English investments in this country. For some time past, American mines have found ready sale in London, and for the most part, those offering there are either absolutely worthless, as in several cases we have exposed, or are so vastly overvalued as to be little short of swindles.

It is the old story over again: 'It is all but impossible to sell a mine in London at a fair and honest value.' And American mines are brought into disrepute by the dishonesty of those who float worthless property there, and the unquestioning credulity of those who invest on their 'fish-stories.'

Mining never was more prosperous in this country than it is to-day, and there is no other kind of investment that offers so large a reward as that prudently made in mineral property, neither is there any other country in the world that has so many good mines or offers so many of the elements of success and profit to the investor.

Products of Bituminous Coal.

"Few persons, says the *Chicago Mining Review*, have an idea of the wonderful products from a lump of coal—a lump of coal that is placed in the retort of a gas manufactory. Ordinarily burned, the combustion of a lump of coal results in carbonic acid smoke (which is merely soot, or rather the visible portion of smoke is soot), and the ash, in which are found silica, alumina, oxide of iron, phosphoric acid, sulphuric acid, potash, sodium, combined sulphur, sometimes traces of chlorine, titanitic acid and other substances. In the gas retort a variety of products are obtained. The gas as it is carried through the hydraulic main to the purifying rooms takes with it tar and ammonia, the latter evolved from the nitrogen. Ammonia has to be washed out with water in an arrangement by which the ammonia is gathered and saved. Tons and tons of sulphate of ammonia are thus made and become an

article of commerce. The sulphur is removed by caustic lime or oxide of iron. The carbonic acid is also removed by lime, but the carbonic acid cannot be removed, and with several others remain in the gas after all efforts to remove it. The others give the gas its smell.

By distillation naphtha and asphaltum are obtained. Asphaltum is a dead oil, very useful to preserve wood. From this, too, carbolic acid is obtained, very important in surgical operations as being the most valuable antiseptic known. From naphtha, benzole, eumol, teluol and cymol are obtained. Naphtha, as is well known, is used as a burning fluid. Benzole is a solvent for grease and oils, very useful in cleaning kid gloves and things of that kind.

Benzole treated with nitric acid produces nitro-benzole. This singularly enough, is used as a flavoring extract by confectioners and for perfuming soap. When used for this purpose it is known in commerce as the essence of myrrhbane, which it is not, although it smells and tastes something like essence of myrrhbane or oil of bitter almonds. Nitro-benzole is terribly poisonous but not more so than some other adulterants used by confectioners.

From nitro-benzole analine is obtained. This when first obtained is a perfect colorless liquid but darkens as it grows older. From analine are obtained the coal-tar colors, which are so very brilliant. The colors are of all hues. The one known as 'turkey-red' is exactly similar to the red that used to be made from the madder root. Since the discovery of this analine it has almost completely broken up the raising of madder in Holland. There, thousands of acres were devoted to the raising of madder root to get the turkey-red dye. It can be made much cheaper from the product of a gas factory."

Henry George on Miners.

In the *North American Review* for September Mr. Henry George, the well known author of "Progress and poverty," and other politico-economic works, makes some startling revelations of the condition of labor in Pennsylvania. His investigations have been mainly among the mining class, which numbers many thousands of men, most of them with families depending upon them. Mr. George, before going into details, calls attention to the extraordinary natural advantages of that great state. It is nearly as large as England, and in the fertility of its soil its mineral wealth and commercial position stands second to no state in the world. It has a fine population of four millions and a half, a mere fraction of what so rich a state is capable of maintaining. If anywhere in the world, labor should there enjoy the greatest rewards. Poverty and pauper wages should be things unknown. But mark the actual state of affairs among the mining class. Pennsylvania is the greatest coal-producing state of the union. She has almost a monopoly of it, especially in the article of anthracite. She has enjoyed (to use a phrase that is becoming ironical) the most stringent protection. And yet her miners are to-day in a condition the most pitiable imaginable. They are the abject, helpless slaves of the great coal kings, men who own whole counties and against whom the power of labor unions is exerted in vain. Mr. George cites the case of a mining strike among the workmen of one of these anthracite magnates who, refusing to listen to the men's complaints, swore he would burst the strike or turn the country into a desert. As he was the owner of whole mining townships and could apply the screw of eviction even more remorselessly than an Irish landlord, it is needless to say that he burst the strike.

The tenements supplied by the great coal men to their workmen are pictures of squalid wretchedness. Workmen have no chance to become property owners themselves because the coal proprietors will not sell, and even if they could the workmen can never save money. Protectionist quotations of their high wages are entirely fictitious. The wages the miners are supposed to receive are in point of fact about double what they actually get. For out of his wages the wretched coal miner has to pay for his own explosive, for the sharpening of his tools, and for the coal he consumes. In England, coal owners have to bear these expenses themselves. Then, too, in Pennsylvania, a system prevails of deducting from the men's pay for impurities in the coal which has become a most tyrannical abuse. Each man has a car with his number attached, and as the car is drawn from the pit it is examined. The smallest piece of shale or the slightest shortage in weight damns the whole load. The miner gets nothing for it and the coal owner gets a car-load without costing him a cent.

The most flagrant abuse of all is the system of company stores. The coal owners maintain establishments for supplying the general wants of the miners, which, from their extortionate nature, the miners have dubbed "pluck me" stores. Prices in these establishments range from 15 to 100 per cent. higher than elsewhere, but the miner is powerless. He must deal at the "pluck me" store on pain of losing his occupation. He seldom sees a cent of his wages. Only the difference between his account at the store and his wages ever comes to him, and oftener than not his account is greater than his wages after the latter have been subjected to the deductions mentioned before.

To fight the coal owners is almost impossible. Legislation could help the miner, but legislation is controlled by the giant monopolists. The latter are all powerful. Sheltered behind the protection screen, they fear no competition. They control the market for their coals, but the only commodity the miner has to sell, his own labor, is left defenceless. On the slightest provocation, indeed without any provocation whatever, Bohemians and Hungarians are introduced to work the mines at wages upon which the Americans cannot exist. In England, where wages are in reality but little lower than in Pennsylvania, and where money goes a great deal further, no one hears of the importation of Bohemian and Hungarian miners. The reason is that in Free Trade in England it is more profitable to employ the best men that can be got, and the English miner is doubly as good a workman as the half-starved Bohemians and Hungarians. In Pennsylvania the coal monopolists are under no necessity of employing the best men. They are sure of their market and consequently are sublimely indifferent to the class of workmen they employ. Protection is bearing its bitter fruit in Pennsylvania.

Deep Shafts of the World.

Western miners have in ten years accomplished nearly as much as has been done in Europe in three centuries. At least such would be the inference when a comparison is made between the deepest workings of the old and new world. The deepest shaft in Europe is the Adelbert, at Prizham, Bohemia, which was started in the sixteenth century, and has a depth of 3,280 feet. The greatest depth obtained by a shaft on the American continent, is the Combination shaft, on the Comstock, which was begun ten years ago and is within thirty-seven feet of being as deep as the famous ancient hole on the other side of the waters.

Mining in Australia.

"PENDRAGON" AT BALLARAT, AND HIS DESCRIPTION OF THE WORK AT THE FAMOUS BAND AND ALBION GOLD MINES.

The following letter by the gentleman who edits the "*Referee*," under the well known *nom de plume* of *Pendragon*, and who is now travelling in Australia for the benefit of his health, is so interesting that we reproduce it for our readers in full.

"When we went to see the Arts and Sciences Exhibition at Melbourne the sight which 'took' my companions far and away above pictures or sculpture or designs or models or anything of that sort, was a case which contained gilt casts of the most celebrated nuggets found in Victoria. About this they hung and hovered. I went two or three times round the show, and always found them in the same place, examining the nuggets, reading how one or other of the most weighty among them had been come upon suddenly and without any premeditation, how another had been found within a few feet of the surface, and so on through the list of auriferous discoveries, the stories of which are often really interesting, even to the mind which is free from the gold fever, now fast spreading again throughout the continent of Australia. There were my couple, oblivious of anything else, calculating the value of each nugget, and reckoning what they could do with the money. The result of all this was that nothing would satisfy them but they must go to Ballarat, the nearest place to Melbourne in which gold mines are now to be found; and as it has been in everything else since we started, the will of the majority—I am ever in the minority—carried the day. So we prepared for Ballarat. It was in vain I explained that nuggets are not found in such mines as exist at Ballarat; that the difference between operations in the quartz and the alluvial is such as to make the journey (from their particular point of view) fruitless.

In due course we arrived at the Band and Albion mine (or claim, as such ventures are still called here), the biggest and most successful of the shafts in this neighborhood, and, having presented our papers, were permitted the pleasures of an inspection. There is no necessity for me to go through a description of quartz-crushing, the throwing down of the gold by its own weight, its attachment by means of mercury, the searching and attracting process of the shaking tables, or any of the other means to the end of obtaining the precious metal from crushed quartz and its accompanying pyrites. Anyone who wants to know all about these things can find them set out fully and far more effectively than I could set them out, even if I had space, in books and treatises devoted to mining in all its ramifications. There is no necessity for anyone to come to Australia to see the battering and extracting processes; thousands of tons of quartz are sent home to be crushed and washed and assayed, and whatever else is necessary, by English means and machinery. Suffice it to say here that what my companions saw was widely different from what they expected. All their dreams of men shovelling up earth, from which they picked great lumps or small lumps (but always lumps) of bright red gold—dreams which I had vainly endeavored for days to show were dreams and dreams only—vanished directly our guide began to explain the mechanical appliances, the way in which the pyrites detritus is dried and ground and made into boiler paint, as well as the rest of the details which must be familiar to so many. There can hardly have been an exhibition of any

importance in England or out of it during the last thirty years but has contained models, often in actual work, of these various machines, together with all sorts of samples and specimens of the results attained by them. Presently, however, we did see something that was interesting even to me. By great good luck we arrived on the ground just as the battery manager was going through the concluding portion of his smelting operations for the week—once every seven days the Band and Albion people cast into a solid block of metal as pure as it can be got the result of the week's mining, blasting, battering, throwing down, mercury-attaching, and shakytabling operations. When we got into the room sacred to this smelting work the gold was bubbling in a crucible, just like broth simmers in a pot. Every now and again, as the furnace man threw in the saltpetre, borax, and whatever else it is used to give the last purifying touches, or withdrew them with their metallic attachments, we were permitted a peep at this precious liquor, which, before we had been there very long, was ready to be turned out into the in-got mould that, greased for the purpose, stood ready to receive it. With a strong and steady grip of the tongs, and without any apparent care for the intense heat which, when the fire was at last thrown open, seemed as though it would burn the eyes out of our heads, though we stood at some distance away, the manager took up the crucible and poured the most valuable stream I ever saw in my life into the mould, where, after giving off as many colors as a dying dolphin, it was soon cooled. When weighed, the tally was 400 ounces, or say £1,650 sterling worth of gold, which may be taken as a fair average for recent years, though in days gone by they have in a week secured as many as 1,000 ounces. In the period of the alluvial, before the quartz reef was struck, when nuggets and dust came up by the bucketful, the Band and Albion was still more profitable. The yield is now about an ounce and a quarter of pure metal to the ton of quartz. Besides the gold, the pyrites, as I have already intimated, pays for the work expended on it. Fifty per cent. of the result may be taken as the cost of working. Thus, 200 ounces of the 400 ounces we saw turned out would be net profit—that is, profit over and above the expenses of men and machinery. As the mine paid almost from the first sinking—Band of Hope, it was then called, and a junction was afterwards effected with a neighbor, the Albion—the number of proprietors and the amount of capital invested are sufficiently small to make this very profitable. In proof of this, I will conclude with the announcement that, during its twenty years of existence, the Band and Albion has produced no less than twenty-six tons of pure gold.

Since the day of our visit I have often wondered whether, if I had refused to go, and the other two had, as they insisted they in such case would do, gone by themselves—whether either or both would at the last moment have gone down the shaft. I don't like to be unjust, but I certainly don't think both of them would have gone, and I hardly think one would have gone without the other. After inspecting the stuff that came up from the mine, all their preconceived as well as their last lingering hopes of nuggets, or even of bits of gold no bigger than pins' heads, had departed, and there was really no reason whatever for going down beyond the reason that you could say you had been down afterwards; and that, as we have good authority for knowing, can always be done without the actual trouble of descending into the earth's bowels. Now came my opportunity. This was not a venture of mine—far from it; I had for a

variety of reasons never encouraged it, but having got so far I had not the slightest idea of turning back until the work was accomplished. It was necessary, owing to the constant dripping of water both in the shaft and cuttings which led from it, that we should cover ourselves up, and this we did with as grotesque a collection of old clothes as ever was got together. To enter into details is hardly necessary; but to make the picture completer I may as well tell you what our outfit was. Dirty overall trousers of canvas, an old pair of what are called half-boots, but which were in this instance quite big enough to be whole ones, and a white (or what had once been white) duck jacket, the look of which I wouldn't have minded at all if it had been but dry—it had been used in the morning by one of the directors and I had to wring the wet out before putting it over my own clothes—an old sou'-wester, and my preparations were complete. Mrs. PEN. got a skirt and a waterproof cloak, and an old bonnet; in Covent Garden so attired she could easily have obtained work shelling peas or carrying baskets. Except that his costume was not so new as the clothes usually worn by him, and that they were not made by Poole, I did not notice any particular change in Mr. Stephens' appearance.

When people go down a coal mine in England, and think they have done something wonderful, they go down a wide, well-drained and equally well-ventilated shaft, seated in a comfortable cage—they might almost be in one of the lifts at the stores so far as concerns lack of violence to their feelings. Here all was different. There was no cage, nothing but the cross-bar, or 'saddle,' upon which the galvanised iron troughs came up full of quartz or went down empty. The shaft was not above four feet square, and as we took our stand upon the wet and dirty piece of iron from which a trough was shifted to make room for us, the water from above poured on us in streams. Mr. Stephens elected to wait above until we had gone down, and so Mrs. Pen. and myself, in company with a guide, departed. There was plenty of room for four of us, standing close together, as was shown by us all ascending on the one 'saddle,' but S. G. prefers to do things his own way; he has done them his own way as far as we have gone, and there was no reason, I suppose, why an alteration should be made in this particular. No matter how crowded on the "saddle" you may be, you can't fall off, as there isn't space enough, but you might easily get your head knocked off, or meet with some similar slight disadvantage, if you did not keep quite steady. Down—down—down, in absolute darkness, for about a minute, when the platform on which we stood gave a lurch and a swing, which made my wife tighten her hold on me and give vent to a smothered groan. "We are now six hundred feet down—I know that mark well; it was there—' and then, as though that story might not be exactly what was fitting under the circumstances, our guide broke off, and we went on in silence. "That's the thousand-foot mark," said he presently; "another hundred—' And hardly had the words escaped him than we bumped upon the hard earth at the bottom of a pit eleven hundred feet deep. Mrs. Pen. would have been very glad to get out at the bottom if she hadn't been so awfully troubled by the knowledge that she had to get to the top again. Mr. Stephens having in due course joined us, candles were handed round and lighted, and we went upon our travels. And we might just as well have stayed up above for all there was to see below. The cutting is very small, just big enough to allow the troughs containing the

quartz to run on a two-foot tramway, and the water is always four inches, and sometimes six inches, deep throughout. Often we had to get down and almost crawl, and the number of times I had to stoop in the ordinary parts so as to avoid knocking my head made me feel like a veritable Gulliver in the neighbourhood of Blefuson. We had to do almost as much wading. Mrs. P., who had not changed her boots, and who flatly refused to get into one of the troughs and squat down in the wet bottom so as to let her head go free under the drooping roof, soon had to be left in a safe corner trying to pick pieces of gold out of the quartz wall, while we pushed on to see what we could see where the miners were working. After desperate struggles we at last came to that part of the reef which was being operated upon, and there being no fans or other apparatus for ventilating the mine, and it now being very far from the shaft, the heat was intense. One of the men at work, in reply to my comment on the heat, took up his shirt and wrung the perspiration out of it. I climbed up a rude scaffolding and got into a hole where a man sat, chip, chip, chipping all by himself, but I might just as well have got into a baker's oven just before drawing time, the heat was that intense; so I came away again. After a rest for a minute we partly waded, partly crawled, partly groped our way back again to where Mrs. P. stood in agonies of apprehension and little less than a pool of water. She had wandered from her coigne of vantage, a rush of air had blown out her candle, and visions of all sorts of dread and danger gibbered and made darkness horrible around her. As soon as we got to the bottom of the shaft we huddled together, and, drenched and miserable, in due course reached daylight again, without anything worse having happened to us than I have described. In lieu of nuggets Mrs. Pen. and Mr. Stephens found some really fine specimens of the nasal and bronchial catarrh, and they now bark and snort and grunt and talk through their noses, and drink hot rum with honey and butter in it, and buy all sorts of cough and cold specifics, and have their feet in hot gruel and bran washes, and stick mustard plaisters all over themselves, and generally make their wretched travelling companion's life intolerable. And through it all they pretend now that they thoroughly enjoyed themselves. I know I didn't; and I don't suppose for a moment they did."

Mining in British Columbia.

Extracts from Mr. Koch's valuable report to the Local Government on the Cariboo Quartz Ledges.

PATENT PROCESSES.

"I must give you warning by calling your attention to the many processes being placed before the public, or before men not skilled in such business as mining and milling ore, for they are the only ones who can be led astray into such wild and impracticable schemes as some of the processes are.

"I will refer you to some of the failures, and if your memory does not serve you well in the matter you can get full particulars from Wm. Ireland, jr., State geologist of California.

"The first one in my mind was introduced by a man I think named Mears, in Chili, ten or more years ago. He became the rage in that great mining country. His process was, of course, a secret. His trials, like all such, were however public; even those likely to fall into the trap were invited to make tests for themselves, all with good results.

"Many wealthy men became bankrupt by buying mines which were too poor to be worked by ordinary process. The promoter was presumably interested in such sales. The matter became so public, and so many had invested their all, that an investigation was had, which resulted in the fraud being exposed and the promoter sent to prison, and, if alive, he is perhaps there yet.

"Among the more recent patent processes is the Frier process.

"Some twenty-two years ago, Meadow Lake district was discovered in the Sierra Nevada mountains, about thirty-five miles from the Central Pacific railroad. The veins were extremely large and well defined, many of them rich. A large town grew up, as it were, in a day; mills built and mines opened, when, to the consternation of all, the ores were found to be refractory, and up to this time they have baffled the most skilful manipulators. About ten years ago, a man named Frier gave out that he had discovered a process by which the ore could be worked. I, with many others, think that he was honest in his belief; but after men of means had spent thousands of dollars in the erection of reduction works it proved to be an utter failure, and to this day, the rich veins of Meadow Lake lie dormant. A San Francisco company by latest advices are shipping in, and erecting a mill, to cost one hundred and fifty thousand dollars. Let us hope the mystery has been solved as to the proper treatment of the ores.

"A more recent process is one started some five years ago in San Francisco and lately revived in Victoria. I had the satisfaction of investigating it some time ago, soon after it was made public. Small works were erected in Sacramento, but never started.

"It was taken east, and I was told that Jay Gould, and other moneyed men, all ignorant of such matters, took stock, and erected works in Colorado. If so, they quietly closed them down; not one of them is at work either in California, or, to my knowledge, in any other country in the world. Every mining man in the world would hail with delight such a process if it were feasible.

"I cannot well afford to make the effort I am now making on behalf of your people, and government, and see my work hampered by having some patent process sprung upon the public, and proved to be an unmitigated failure after costing individuals or the government thousands of dollars; and the fault be laid on the mines as being valueless. I refer those that have witnessed the process, and feel anxious to investigate, to such men as Wm. Ireland, jr., State geologist; Prof. Price, assayer and chemist; C. A. Luckhardt, of Nevada metallurgical works, and H. Kustell, assayer, all prominent men in that branch in San Francisco. Either will be pleased to give them information on the subject.

"I must not let any patent process escape me for fear you may deem it applicable to your ores, because I neglected to report or state my views on the subject. I therefore call your attention to an article in the *Mainland Guardian* of July 31st, 1886.

"I do not deny the possibility of saving the gold by the process referred to in the article; but the very fact of the pulp or ground ore having to pass over a bath of melted copper explains at once that the ore must be dry-crushed, that process at once reduces the crushing capacity of the mill over one fourth as compared with wet-crushing; and the same per diem cost of fuel and skilled labor goes on.

"Next, in order to reach the gold, all the crushed ore, sulphurets, and vein gangue alike must pass over the molten bath which requires

fuel and skill to keep to the requisite temperature as well also does it require skill to keep the pulp passing evenly over the bath, and lastly when your gold is gathered, you must resort to the expensive method of parting the precious metals from the copper, which process alone would go far towards de-sulphurising and chloridizing as now done in California.

DIFFERENCE IN COST OF MINING IN BRITISH COLUMBIA AS COMPARED WITH CALIFORNIA.

"In the absence of statistics, I will attempt to show the difference in the cost of mining and milling in California as compared with Cariboo, and the very probable results to be obtained from the energetic, careful and scientific handling of your large and well defined gold-bearing veins.

"Skilled labor, which includes mechanical engineers, smiths, millmen, and chloridizers costs, in California, about four dollars per diem.

"First-class miners and blasters cost \$3, and second-class from \$2.75 to \$2.50. Outside labor, including Chinese, averages \$2 per diem. Wood, for steam purposes will, no doubt, average, at this time, five and a half dollars per cord, while the ores milled do not, in my opinion, yield to exceed eight and a half dollars per ton. That estimate may seem small to a California miner, but when it is remembered the enormous quantities of low-grade ores milled by such companies as the Plumas-Eureka, Sierra Buttes, Douglas Island, Doctor Zielie mine, and many others, it greatly reduces the average as compared with the few stamps milling \$12 to \$20 ore. And yet the far-seeing capitalist of California finds investment in a quartz mine one of his best investments, and does not hesitate to erect the best machinery that skill can invent, whereby mining may be made a legitimate branch of industry; and my examination of your veins has led me to carefully study the situation as compared with the above. I find skilled labor, as above, will perhaps cost \$6 per diem, good miners \$4, second-class \$3.50, while outside labor costs \$3, and wood not to exceed \$3 per cord.

"While I feel safe in placing the milling value of your ores at from \$17.50 to \$20 per ton, and I feel confident that those figures can be safely advanced from ten to twenty per cent., but I have endeavored to be cautious in the examination of your mines, and my statements to your people, and do not wish to cause them to be over sanguine until milling results are reached. I have made the above estimates as to cost after talking with your most prominent citizens, and estimate the value of your ores after making over fifty assays from the different veins, and carefully testing the feasibility of chloridizing the sulphurets contained in the ore.

MINERALOGICAL SURVEY.

"I deem it of the greatest importance to the province that a systematic mineralogical survey be made, not alone of this immediate vicinity, but of the outlying and surrounding country. The survey should be so managed as to keep pace with the prospector, rather than neglect the work commenced by extending the examination too far beyond present work; for, by extending the survey beyond present developments, you deprive the prospector of the assistance and advice of your engineer.

"As I have previously stated the government can materially aid and assist the prospector in his work of development, and often save him much time and money by having an intelligent and practical engineer near by to consult and to

advise him as to the best method to prospect his ground, and as to the probability of reaching pay-ore.

"In this connection I will state that I see a bill is presented before the house in New Zealand whereby it is proposed to appropriate one hundred thousand pounds to aid in developing the mineral resources of the colony; while the United States has, perhaps, the most complete and extensive mineralogical survey system of any country in the world, and the result is—what? English and French capital come to the United States in preference to any other country. They read, and have the mineral resources of the country explained to them constantly.

"Following upon the heels of the annual mineralogical report, enterprising men go to London and Paris well supplied with samples of ore, and elaborate maps of mining property, and gifted with national go-ahead-itiveness and never-let-go, they annually induce a large amount of capital to come into California, Nevada, Colorado, Idaho, New Mexico and Arizona. Not one of these states or territories but have large English and French companies successfully at work; and the more capital they invest the better they are pleased in case it yields from six to ten per cent per annum.

"The capital can be turned hitherward; not, however, by sitting supinely waiting for its coming.

"Ask an Englishman which he would prefer—Canada or the United States, and why, and he will answer "The United States, because there is more dash, enterprise and go ahead amongst the people." Including Alaska, Oregon, California, Idaho and Montana, mining industries have almost surrounded you, and the outside world scarcely knows that you are the possessors of such promising and well-defined gold and silver-bearing veins.

"Several years ago so eminent a man as Prof. Dawson took with him to Montreal samples of the quartz broken from the croppings of your veins, and reported to you from five to six dollars per ton, and encouraged you to hunt in those veins for richer ore, as they were, beyond doubt, the sources of the many millions of coarse gold intermixed with quartz taken from your creeks and benches, and no richer placer diggings were ever discovered than your creeks and benches through which the veins pass. Do not forget that the mountain will not come to you; on the contrary you must seek capital and give it encouragement, and the day will come when your district will again rank as formerly amongst the great gold producers.

"Capital, at present, is seeking investment in the most remote corners of the globe. All manufacturing industries are overdone. Silver is a drug upon the market and can scarcely hold its place as a circulating medium, while, (including the product of the entire world) gold enough is not now produced to supply the arts and sciences. Then why not use energy and push enough to induce English capital to come to your district?

"In referring to capital seeking investment I may refer you to the circumstance of an English company formed to work the gold quartz found in South Africa. In order to be well equipped in every detail, their mill was built in San Francisco, shipped overland to New York, thence to England and transhipped to Natal on the south coast, where it had to be hauled by cattle seven hundred miles inland. Also, one of a hundred stamps and necessary amalgamating pans was built in San Francisco and shipped to Peru, where, by rail and mules it had to reach the giddy height of thirteen thousand feet, near the

summit of the Andes Mountains, to work a silver mine.

MANAGERS OF MILLS AND MINING PROPERTY.

"I can not too strongly impress upon the minds of those proposing to invest in, or operate mines, in this district, the great importance of selecting none but the most competent of men for their managers. They should come with good references as to ability and integrity.

"Favoritism, friendship, partnership, good honest men and too old to work, and such like considerations that can be advanced for making appointments, which might lead to the ruin of a company, or, at least, the useless expenditure of thousands of dollars, should all be discarded.

"The day is past for appointing ministers out of place, highly-educated physicians and lawyers or rich men's sons just out of college, because their fathers are largely interested.

"Appoint some man who has had years of experience of vein mining, one who has cost some San Francisco or Eastern company half a million of dollars by some blunder made years ago. He has had experience, and blushes, and wonders how he could have made such mistakes as he has. He will, even now, make small mistakes, but he is quick to discover and remedy them. Good men can be procured, men that have worked in and helped to open the finest mines in the world.

"A manager should be able to run an engine, know how to run a mill in all its branches, know when each stamp is doing duty, detect a loose mortar bolt, cut out any kind of timbers for shaft, drift or elsewhere, sharp a pick or drill, and, in fact, he must, be a miniature encyclopaedia, and he must be honest, temperate and kind.

Meeting of the Austin Mining Company (Limited.)

The annual general meeting of the shareholders of this company was held at the company's office in Ottawa, on the 28th ult., the meeting being largely attended by those interested. Little was done beyond the election of directors, the new board being, Hon. W. A. Henry, G. H. Perley, J. A. Gemmill, E. Grant Powell, J. F. Nellis and G. F. Austin. The operations of this company have been much hindered and obstructed by the action of some of the holders of paid up shares, but now that the management has got into the hands of capable men it is to be hoped there will be no further obstruction, and that capital may be secured to put the property on a working basis.

Alfred Krupp, the world famous German miner and manufacturer, employed in 1881 no less than 19,605 hands, upon whom were dependent others to the number of 45,776. In other words, the people whose bread is earned in Krupp's works, would fill a city of 65,381 inhabitants.

The *London Iron Trade Exchange* says, "that returns of the mineral production of France in the first six months of the year show that the output of coal was 9,696,573 tons, an increase of 319,862 tons on the same six months of 1885. The manufacture of pig iron fell from 829,366 tons in 1885 to 763,225 tons in 1886; puddled iron rails from 1,468 tons to 480 tons; merchant iron from 332,795 tons to 326,023 tons; sheet iron from 59,829 tons to 47,620 tons, and steel rails from 182,084 tons to 146,269 tons, and steel plates from 25,638 tons to 22,987 tons. The production of merchant steel rose from 48,237 tons last year to 55,538 tons in 1886."

MINING NOTES

Nova Scotia.

The main shaft of the Cowan gold mining company has already yielded upwards of \$20,000.

The *Annapolis Spectator* announces the discovery of a rich lead of gold bearing quartz in Caledonia. The samples shown by Mr. Charles Ford, of Maitland, are said to indicate unusual richness.

We learn from a recent issue of the *Critic* that Mr. R. Macnaughton has brought to Halifax 600 ounces of gold, the September product of the Rawdon Mines, and that a new 25 stamp mill is now in operation there.

A local exchange informs us that a brick of gold weighing 319 ounces and valued at over six thousand dollars was brought to Halifax, N.S., from the Oxford mines at East Halifax. It represents thirty days' work of three men.

The work at the Coxheath copper mine of cross cutting from the shafts at the 200-foot level directly to the new vein, 70 feet north is now being carried on. Some 180 feet has already been accomplished, proving the continuity of the ore body for that distance.

On Wednesday, 22nd ult., a fire broke out in one of the engine houses at the Albert mines, Albert County, and five buildings, including engine house, blacksmiths' shop, carpenters' shop, a dwelling and store house were completely destroyed. No estimate has been given of the loss, which is not covered by insurance. It is thought that the conflagration was the work of some unknown incendiary.

The gold mining outlook, says the *Critic*, grows brighter and brighter every day. New finds are frequently reported, and best of all the capital to develop them is at once forthcoming. The find at Malaga Lake, in Queen's County, is likely to prove one of the richest in the Province, but unfortunately it seems destined to undergo the same trials as the famous Salmon River mine. Rival claimants are in the field, and as the property is undoubtedly very rich, a settlement will hardly be reached without an appeal to the courts. Under the system at present in vogue of taking up mining claims, it is the easiest thing in the world to put in a bogus application and force properties into litigation. No capitalist will look at a mining property in the title to which there is the slightest suspicion of a flaw, and, taking advantage of this, unprincipled men make a contest on the most frivolous pretext and often succeed, where the real owners is anxious to sell, in forcing a compromise and getting an entirely unmerited share of the mine. This business has been reduced almost to a science, and if not put a stop to in some way, is bound to do immense harm to the gold mining industry. We do not know that these remarks apply to the Malaga Lake contest, as we are not familiar with the points at issue, but we do know that similar tactics have succeeded in numerous other cases.

A radical cure must be found for the evil, and we would almost favor making it a penal offense to put in a bogus claim to a mine. In most cases it is simply an attempt to extort money through false pretenses, and should be punished accordingly. A party contesting should be obliged not only to furnish security for costs in case he failed in the suit, but also security for any damage that the owner incurred through the contest. This alone would prevent any but *bona fide* claims being raised. Time is everything to a mine owner, and any disputes should be adjudicated upon at once, and it might be well to have them referred to a mixed board of arbitrators, composed of mining experts and judges of the Supreme Court, where decisions in all cases should be final. When the Mining Association is organized, this subject should be one of the first to demand attention. It is an easy matter to drive capital away from a country, but a most difficult matter to restore confidence where it has once been lost. Outside of this one cloud of litigation, the mining horizon is clear. The capitalists now investing their money in this Province are also practical miners, and are not to be made the dupes of dishonest men. The day of the cunning mine manipulator has gone by and the best proof of the value of the gold mining industry in Nova Scotia lies in the fact that mines are now bought and sold solely on their merits.

New Brunswick.

The mines at Markhamville are said to be shipping manganese all the year round.

Operations at the manganese deposit near Sussex have been suspended, pending an equity suit. The mine has been leased and worked by a Mr. F. W. Stockton, but another mining expert claims an interest, which is repudiated, and hence the action.

Quebec.

A new company styled the St. Lawrence Corporation (Ld.) has been organized in London, Eng., with a capital of £100,000, 100,000 shares of £1 each. The objects of this corporation are to purchase, lease, or otherwise acquire, hold and work timber and other lands, mines minerals, hereditaments, and premises in the Dominion of Canada, and in particular the lands and estate known as the Mille Vaches Estate, in the county and district of Saguenay, bounded in front by the river St. Lawrence and behind by the public domain, on the south by the township of Iberville, and on the north by the township of Laval, together with all the timber, and all minerals on and under the surface, the houses, and other appurtenances, and all rights, and to acquire and undertake all or any of the assets, debts and liabilities of the Dominion of Canada Freehold Estate and Timber Company, Limited.

Ontario.

The first shipments of Canadian Iron ore to Lake Erie Ports was made to Cleveland last month and consisted of 540 tons. The mines on the Central Ontario Railroad, owned by a Cleveland Syndicate, have been shut down owing to a cessation of demand since last March. The *Cleveland Iron Trade Review* says that during 1885, 10,508 tons were shipped from these mines, of which 100 tons went to Bessemer, Pa., and the remainder to Cleveland. There were mined, however, during 1885, 32,059 gross tons, of which 3,752 tons were second-class ore. It will thus be seen that 21,551 tons were added to the stock piles last year, besides the amount mined from January 1st to March 31st inclusive,

this year. It is understood that the cessation of demand for this ore was owing to the presence of titanium, which rendered roasting necessary, and that no more ore will be mined until that on hand is first roasted. It is also known that the ore already delivered on Cleveland blast-furnace docks is roasted before using.

THUNDER BAY DISTRICT.

The mill at the Rabbit Mountain Mine is now running very smoothly and is said to be stamping about \$250 a day.

Messrs. Harvey & McInnis are having their property at Silver Mountain surveyed, and as soon as the waggon road is constructed they will proceed with the work of development.

Mr. H. Wilson, of Mount Forest, reports that a stock company, with a capital of \$150,000 has been formed to develop the Heron Bay Mine. This property is very conveniently situated close to the railway station.

A new Prospect is just being opened on the Port Arthur side of the Beaver Mine. Messrs. Crawford & Corbett are taking out rock bearing quantities of argentiferous galena. Some very fine specimens are being shewn.

Mr. T. A. Keefer has commenced operations at the Little Pig Mine. This property, which adjoins the north end of the Silver Creek Mine and the Beaver Mill on the west, is owned by himself and Mr. Oliver Donnais.

Recent reports from the Silver Falls Mine (4½ miles from Port Arthur) indicate that ore will be struck soon. The shaft is now down about fifty-two feet and the water fills in so rapidly that an engine is needed to pump it out.

Operations at the Beaver Mills are expected to be begun about the middle of this month. The houses, shops and mills at this mine are very systematically laid out. Mr. White has charge of the mechanical department and Mr. Crow is reputed a thoroughly practical and experienced miner.

A party of prominent miners and capitalists, including Mr. Alex. McEwen and his three sons, Messrs. G. A. Thompson, A. J. Duffield, and T. A. Keefer, received Sir A. T. Galt and a number of British capitalists quite recently at Port Arthur. The object of their visit to the district was ostensibly to re-open the Silver Islet Mines and to organize for a thorough exploration and development of the gold and silver mining region on the North Shore of Lake Superior.

During the past month the Rabbit Mountain Mine was visited by J. H. Burwell, general manager of Mast Buford & Burwell, machinery house; R. B. Nalusha, general solicitor of the St. P., M. & M. road; H. Sahlgard, real estate dealer, and vice consul of Sweden and Norway, all of St. Paul, and John Crubach, railway contractor and bridge builder, Rock Island. The party were delighted with their visit and carried away with them a silver bar weighing 37½ lbs., 95 per cent. of which is solid silver. The mine is owned and controlled largely by St. Paul parties, and it is their intention to enlarge the working capacity to a considerable extent. At present they have a shaft about 120 feet down

and have commenced to work on levels and side cuts.

Several complaints are being made by the miners about the bad condition of the roads in the district, which they say prevents anything like a systematic development of their properties. The road on the other side of the Silver Mountain is in a particularly wretched condition, travel being much impeded by large numbers of stumps from two to three feet high. In winter fully three feet of snow will be required to make the road fairly passable. An expenditure of one thousand dollars should be sufficient to make a good winter road here. As matters stand at present the average rate for carrying freight and supplies is about two cents per pound, a heavy tariff very detrimental to the progress of development, and in the interests of the country it is desirable that steps be taken as soon as possible to have these obstructions removed and the road placed in a passable condition.

The following gentlemen constitute the first Board of Directors of the recently organised Thunder Bay Colonization Railway Company: Thomas Marks, merchant; D. F. Burke, capitalist; George T. Marks, merchant; George H. Macdonnell, contractor; Thomas S. T. Smellie, physician; W. G. Smith, merchant; Michael Dwyer, contractor; Allen R. Macdonnell, contractor; T. A. Gorham, barrister. Referring to this the *Sentinel* writes:—"It is our pleasant duty to chronicle the arrival at Port Arthur of the first silver brick ever manufactured in this district from Thunder Bay ore. Although, of course, in the past large quantities of barrelled ore as it came from the mine, and concentrates from the various mills, have been shipped. The Rabbit Mountain Mining Company is the first institution to have built a mill which produces silver by amalgamation as well as by concentration. The bar in question weighs about forty-five pounds and it is rendered doubly valuable in the eyes of mining men from the fact that the whole of this has been collected from the tailings which have passed over the ordinary sluiceways, and the silver of which in the mills heretofore built in the district was also entirely lost to the proprietors. To those unlearned in mines it is hard to understand the value of the product from samples of the concentrates, but the most unlettered in a mining way can readily see and understand its product when of pure silver. The bearing of each of these interesting events have a most important effect on one another. Without the Thunder Bay Colonization Railway the mines cannot be worked to their full extent, nor can they be worked as economically as their most ardent admirers would desire. And without the mines one of the most important factors in the future success of the railroad's traffic returns would be wanting.

From present indications we are happy to say that we are not only likely to have the railway, but that beyond peradventure the mines of the Thunder Bay district will play an important part in furnishing traffic for the new line."

Manitoba.

Work at the Cascade Coal Mines, near Banff, is being vigorously pursued, and the owners will soon place their anthracite coal in the market at Winnipeg. The Canadian Pacific Railway have been using it on some of their engine, running on heavy grades, but their report of the test is not yet available. The Canada Anthracite Coal Company are putting new machinery in place,

and are doing everything in their power to conduce to the full development of their property.

British Columbia.

A number of men are out in the country to the north of Bayne's Sound prospecting for gold.

Mr. Krail, a mining expert, who visited the interior a few months ago, and then went to California, has returned to Victoria. He states that this country is rich in minerals, and will locate permanently here. He is examining a ledge 1¼ miles from the city and will soon report on its value.

Mr. J. M. Smith, who has recently been engaged in collecting geological specimens for the local government, brought from the Selkirks a number of valuable specimens of mineral ores. Amongst other samples was one thirty-pounds in weight taken from the Kerr, Corbin and Kennedy claim near the summit of the Selkirks, about 30 miles east of Farwell. An assay made of this ore went as high as \$700 to the ton. The owners refuse to sell, having means enough of their own to work the lead effectively, and have sent forward a carload of the ore to be smelted at Chicago. Mr. Smith also brings with him samples of gold-bearing free milling ore from the Bonanza King or Bright & Tayford lead in the Big Bend district; and in addition, a specimen of silver ore from a mine at Spellmehcen, about 30 miles from Farwell, which assays \$116 to the ton.

Mr. G. A. Koch, a mining engineer, who has been for some time past testing the value of quartz ledges in the Cariboo district, for the local government, expresses the opinion that gravel mining in this district is virtually worked out. He reports the quartz interests throughout the whole district as good, and gives the following information regarding the mineral wealth and the various gold bearing properties in and around Cariboo.

There is a ledge called the Bonanza upon which the B. C. Mining and Milling Co. have located their claim; and have got a shaft down 100 feet from the surface passing through a vein 23 feet wide. Mr. Dunlevy, of Soda creek, has got engine power on his claim on Island mountain sufficient for 20 stamps, and all the power necessary for the concentration of the ore. The B. C. M. & M. Co. have got machinery for 40 stamps, which was formerly bought for the free milling process. Mr. Koch has made no less than 100 assays of ore taken from lodes in the Cariboo district, and in his report to the government states, that the ores average from \$17.50 to \$20 per ton. The cost of mining and milling these sulphuret ores will not exceed that of mining and milling free gold ores, because the cost will more than offset the cost of the closer milling necessary for sulphurets, so that the percentage is in favor of mining the latter class of ore. Aside from these considerations, free milling mines are as it were, only of a day, while the sulphurets are well known to be continuous. There is, for instance, the Providence mine in Nevada county, and the Dr. Zealy mine in Calaveras county, California, which have been working for many years, paying well, though the ore of the latter mine only averages \$6.50 per ton. From the Treadwell mine (Douglas Island) owned by Senator J. P. Jones and others, a parlor test was sent to San Francisco which returned \$7 to the ton, which was sufficient to convince them that they could make a perfect success. The first mill forwarded was a five stamp one,

and its workings confirmed the first test. Then they despatched a 120-stamp mill which is now in full blast, producing a proportionate yield. It is moreover said that another mill of the same capacity will shortly be likewise set at work there. Mr. Koch has assayed over \$600 to the ton from the ore of Island Mountain, made, not from selected samples but from extremely rich sulphurets which exist all through the ore, while again, sulphurets can easily be found that are very poor. The average of the sulphurets of this province, he says, are far richer than those of California. In one instance out of two pounds of sulphuret Mr. Koch took out gold amounting to four thousand dollars per ton, which must not however be confounded with the average result. There are no means of determining where these rich spots occur, they are so minute and so generally distributed through the veins. He considers that the veins will prove to be permanent and that this province is destined to become a great gold mining country. The only question is that of freight and duties, as it is an impossibility for mining machinery to be made at Montreal until they have had experience: consequently, the machinery will have to be imported from San Francisco.

Mr. Koch has shipped a box of samples of these ores to the Toronto exhibition, and will take with him to San Francisco, a similar lot of samples for exhibition to mining men. The formation of the country, he declares, to be identical with that of California—slate, granite, porphyry, etc. but with richer sulphurets.

El Callao, the great Venezuelan gold mine, produced and sent to England \$203,000 for July, out of which a dividend of \$6.20 per share was paid, aggregating \$257,000.

We are informed that operations at the Wright silver mine, near Lake Temiskaming, are being vigorously pushed. An expensive smelter has been completed, and the exportation of quartz has been rendered unnecessary in future.

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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, tin, 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 also, 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 file with the local agent, proof that he has expended not less than five hundred dollars in actual mining operations 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 six 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.

1886.—The Minister of the Interior may grant a location for the mining of iron, not exceeding 100 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 thus 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 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, location, marking of localities, agent's 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, beach, creek or hill districts, and the rights and duties of miners are fully set forth.

The Regulations apply also to

Bed-rock Flakes, Drifts, 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 districts, &c., &c.

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 claim Company." "Grant for drainage." "Grant of right to divert water and construct ditches."

Since the publication, in 1881, of the Mining Regulation to govern the disposal of Dominion Mineral Lands, the same have been carefully and thoroughly revised with a view to cause 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.



THE INTERCOLONIAL RAILWAY OF CANADA.

and Freight Route,

BETWEEN

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D. POTTINGER,

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Railway Office, Moncton, N.B., Nov. 12th, 1886.

FOR SALE,

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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.

THE 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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