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Canadian

Established 1882

Vol. VI.—No. 8.

1888.—OTTAWA, AUGUST—1888.

Vol. VI.—No. 8.

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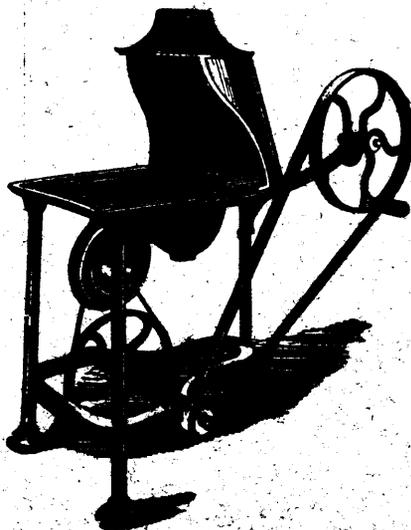
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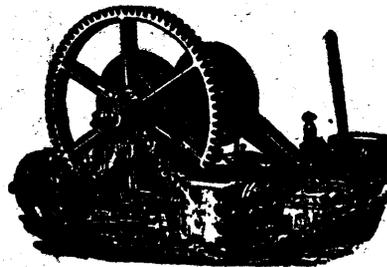
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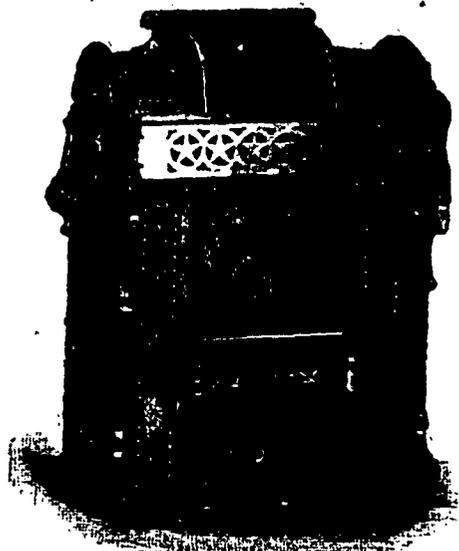
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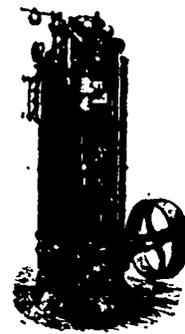
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ing processes practically tested. Laboratory instruction  
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**Proposed Scheme for Keeping Mines**

**Clear of Inflammable Gas.**—Mr. Gilbert  
McPherson\* proposes to effect this object (1)  
by draining the coal of its gas before it is  
worked out, while the bords are being driven;  
(2) by removing the pillars according to a plan  
by which the goaf is kept clear of inflammable  
gas. The first of these plans has never been  
tried, but the second has been successfully  
applied in one instance. In the first scheme it  
is proposed to exhaust the gas from the coal,  
before it is worked out, by artificial means (the  
ordinary system of ventilation being still em-  
ployed) so that it could give out no gas while  
being taken down. This is to be effected by  
laying down the shaft from the surface a small  
column of pipes, and laying throughout the  
mine a system of gas-draining tubes, a small  
branch being carried into every working-place.  
In the centre of each working-place a hole  
would be drilled to the depth in each case  
which experience would determine for each  
particular seam. Into this a tamping block or  
plug would be inserted and screwed up so as to  
make it air-tight, and a connection made  
between it and the draining-tubes by means of  
a small India-rubber hose, distended with wire,  
united to the tubes and the tamping plug by  
union couplings of the simplest description.  
On the surface an air-pump of suitable dimen-  
sions would require to be erected and con-  
nected with the column of pipes. When the  
whole connections were made and the air-pump  
started, the air contained in the holes drilled in  
the coal would be exhausted and a partial  
vacuum formed, when the gas in the surrounding  
coal would be swept into the drain-pipes owing  
to the atmospheric pressure forcing the air  
through the pores of the coal, the air in its  
passage becoming charged with inflammable  
gas. In the second scheme it is proposed to  
remove the bords after a system that the author  
illustrates, by which, instead of beginning to  
remove them in the usual method, an air-course  
is first arranged round their district, and this  
air course is maintained till every bord is  
removed. In the stoppings on the side of the  
main air-course, which are of the usual descrip-  
tion, three-inch wooden tubes are built in at  
suitable intervals, and by means of these minia-  
ture air-courses a quantity of air sufficient to  
ventilate the goaf constantly circulates. This  
method has been successfully tried in a mine  
belonging to Messrs. Galloway & Co., at Hurl-  
ford. There can be no doubt that by keeping the  
goaf free from inflammable gas a very great  
danger is removed.

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When the Appetite fails; when the Stomach rejects all kinds of food; when the System is run down; in cases of MENTAL and PHYSICAL OVERSTRAIN, causing Debility,

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Will supply STRONG NOURISHMENT that can be retained and thoroughly digested by the Weakest Stomach; it will give TONE to the Stomach, restore waste from whatever cause, and supply FOOD FOR BRAIN, BONE AND MUSCLE.

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**Production of Cast Iron.**—The *Revue Universelle des Mines* gives the following particulars of the world's production of cast iron, which may be of interest to our readers:—In 1880 the production of cast iron of the whole world was 838,000 tons, in 1885 it was 19,406,000 tons. During the period comprising between 1865 and 1886, the increase of production, calculated for the year of greatest production was: In the United States 456 per cent.; in Germany 237 per cent.; in Austria 152 per cent.; in England 76 per cent.; in France 64 per cent.; in Belgium 63 per cent.; and in Sweden 53 per cent. Great Britain produces more than the United States, which in return consumes more cast iron than steel. The consumption of the United States is at the present day one-fourth of the cast iron and one-third of the steel produced by the entire world. The diminution of cost of production effected in modern times by the improvements carried out in processes of manufacture is wonderful. Thus, a gross of steel pens, which are to-day sold at Birmingham for 4d., formerly cost £7 to produce. This industry is so important that a single manufactory at Sheffield now weekly sends to Birmingham 20 tons of rolled steel to be converted into pens.

**An Engineering Feat.**—An engineering work of singular magnitude and importance has just been inaugurated at Arques, near St. Omer, in France. The undertaking so successfully inaugurated is the work of Mr. Edwin Clark, C.E., of Great Marlow. The *Colliery Guardian* says: the work comprises a canal lift, superseding the series of ordinary locks, which at present so seriously impede the traffic on the large canal system communicating with Belgium. The Continental canals are on a much larger scale than our own, the canal boats usually carrying from 210 to 230 tons. The ground at this particular spot rising very rapidly, there are five or six locks in close contiguity, involving great loss of time and great cost in their management. By this invention of Mr. Clark's the canal boats are now lifted the whole height of nearly fifty feet at one operation, occupying only a few minutes of time, and no loss whatever of water. This singular machine consists practically of a gigantic hydraulic press, whose piston is 3 ft. 3 in. in diameter and 50 ft. in length, by means of which the boats themselves,

actually afloat in an enormous tank or reservoir, are bodily raised or lowered, water and all, to the required height. This reservoir is in reality an actual length of the canal itself, made of wrought iron plates, separated from the rest of the canal by iron gates, which are opened when it is raised into its proper position at the required height. There are two such presses, the one descending while the other is ascending, and they thus balance each other, and no steam engine or other mechanical power is required, although the weight lifted at each operation, including the water and the loaded barges, is very nearly a thousand tons. Sixteen hundred barges have already been lifted prior to this public inauguration, the task being performed by a single man, whose only work is the opening and shutting of a small valve, and the operation only occupies a few minutes. A smaller lift on this principle was erected by Mr. Clark some years since in Cheshire, and was then patented, but he has just completed a still larger lift in Belgium, which will be opened during the present month. The same system is now being adopted in Canada for transporting sea-going vessels across the isthmus which intervenes between the Bay of Fundy and the Gulf of St. Lawrence.

**Grindstones.**—A correspondent of an eastern paper gives a description of a visit to the Bay of Fundy and along the shores, where the grindstone quarries are located. The superintendent of the quarry says when the tide is out his men go down at the rocky shore and work out near the water. At low tide the men on the shore drill some holes in the ledge, put in powder, and blast out great pieces of rock. When the tide rises again they float out big logs and empty barrels over where the loosened rocks are. When the water goes down again they fasten a big rock to the raft with heavy chains so when the tide again rises it lifts up the raft and the rock with it. Then they tow as near the shore as they can. If it is the right kind and size for a millstone, sometimes it is allowed to lie there until the workmen, with stone chisel and hammer, work it into proper shape. At other times, by means of a derrick, it is drawn out on the wharf. Then it is rolled on a track and hauled to the factory.

### In Reply to Dr. Selwyn.

ST. IGNACE, Mich., Aug. 16th, 1888.

SIR,—I noticed in the last copy of the REVIEW a letter from Dr. Selwyn repudiating the idea that Canadians are ignorant of the value of their mineral resources. I regret to say that my experience proves the existence of that state of ignorance. I failed in getting a blast furnace company started in Toronto chiefly on account of the dense ignorance of everything connected with the Canadian iron deposits shown by almost all the business men on whom I called in connection with the above project. Numbers asked if I would not be obliged to bring ore from the States for the furnace. One leading business man refused to listen to anything on the subject because "there are no iron ores in Canada." Out of one hundred and thirty leading men on whom I called, only seven showed an intelligent knowledge of the Canadian ores. They all knew more or less about Sudbury; but the large majority were surprised to learn that there were plenty of iron deposits within 200 miles of Toronto. The work of the Geological Survey is unnoticed by the greater portion of the public. Yours, etc.,

SAMUEL D. MILLS.

## The Canadian Mining Review

CONDUCTED BY . . . . . R. T. A. BELL.

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### Electricity as a Mining Power.

One of the chief factors in the near future of mining operations, is destined to be the electric transmission of power, the adoption of which will be found in the long run to be both profitable and economical. In localities where fuel is scarce and transport difficult, steam power is unprofitable, and as regards water power, many obstacles of locality and position interfere to prevent its use. But the method recently discovered of transmission of power to a distance at an economical rate will practically take the place of both steam and water. The Sprague Electric Motor system guarantees to transmit any desired horse power five miles or more, and to use the language of the prospectus before us, "is easily handled, can be applied at any angle, requires little attention, does away with the smoke and noise of the steam plant, vertical shafting, piping, &c., necessary in mining, and so saves the great loss of power incidental to the use of the same." The use of this motor at Big Bend on the Feather River, Butte Co., California, instances its power and usefulness. An electric circuit of 18 miles is established there, at 11 desirable points along which circuit, feeders are run out to Sprague motors, placed at the points on the river bed where power was required for pumping, hoisting, &c. These being perfectly flexible can be easily extended either way for a mile from the point of intersection with the main conductor, and the requirements are obtained by the expenditure of a small amount of money compared with the value of the end obtained. In Richmond, Va., the Union Street Railway Co. use this electric motive power for at least 20 miles successfully under the most difficult conditions, and for a protracted and exacting service. It is now no longer a matter of doubt, but is proved by actual operations, that by its use rich but hitherto unproductive mining property may be profitably developed. Careful estimates have been made by the Sprague Co. which show a good margin of profit in the delivery of water power transmitted from one to twenty miles. There is a location in Michigan now worked by compressed air, where the proportion of power utilized only amounts, after the loss in transmission, to 35 per cent., whilst the Sprague motor system guarantees to deliver at the mine 70 per cent. Again, freezing in winter and the wear and tear attendant on compressed air machinery is done away with. Nearly the same data of cost and loss of transmission of pneumatic power apply to steam energy, whilst the loss of power in transmission by wire for one mile is shown by experience not to exceed 10 per cent., so that taking 100

at the dynamo, and allowing 10 per cent. loss there, 10 per cent. of 90 by transmission, and 10 per cent. by reconversion at the motor, 70 per cent. of the generated power is the net delivery for work. Taking its place with the other electrical appliances of the mine, such as lighting, &c., it will enable all mining operations to be carried on by transmitted energy of some at present wasted water power one to twenty miles distant. Aspen, in Colorado, gives practical evidence of this, where the motor is used for hoisting, and for driving a stamp mill. As a traction power its operation is evidenced in an electric tramway at the Sugar Refinery Works, East Boston, Mass., where loads averaging 10 tons per trip, each trip occupying five minutes are drawn, where ordinary horse power only drew a load of one and a half tons, averaging 15 minutes, and the dynamo lighting the premises runs the motor. For hoisting, pumping, stamping, hauling and ventilation of mines the Sprague motor will be invaluable, and for efficiency and economy this electric transmission of power seems to be the most valuable discovery of the day. The cost of an electric power plant, as compared with any system of air compression is not over 40 per cent. (and nearly the same figure applies compared with the cost of transmitted steam energy) of the present cost of working under ordinary methods. The offices of the Sprague Electric Motor Company are 16 and 18 Broad Street, New York.

### Chapman's Assay Notes.

A pressure of matter on our columns last month crowded out a notice of the second edition of the above manual by Professor Chapman of Toronto. This work, which the author in its title page styles "Practical instructions for the determination by furnace assay of gold and silver in rocks and ores," is almost so much condensed, as the information it conveys is very valuable, and would bear more detailed explanation, especially for the younger students in that branch of mineralogy. The author has evidently noticed this himself when he states in the preface that "the work being intended for use in the laboratory" the student will see for himself many of the details which are omitted. It must be borne in mind that the assays explained are not of metals, but of rocks and mineral ores for the detection and determination of any gold or silver that may be present in them. Directions for selecting samples for assay are given, which if properly followed, would save much disappointment, for it not unfrequently happens that the best samples are picked out for assay, and consequently a result is obtained quite misleading and not all in accordance with the general yield of the rock or vein from which they have been forwarded. This direction especially is well worthy of notice. The various processes of assays are described, and as a handbook to accompany actual manipulation, the work in question has much to recommend it. Professor

Chapman's researches are so well known, that his name alone gives an authority to any emanation from his pen, and we recommend the possession of this manual to all concerned in this interesting branch of mineralogical study. It contains a few additional paragraphs beyond what is to be found in the first edition of the handbook, and the original tables have been revised. It is published by the Copp Clark Co. Toronto, and is neatly got up in cloth.

### Ontario Mineral Exhibits at Cincinnati

We have before us a descriptive Catalogue of the Mineral Exhibit of the Province of Ontario, at Cincinnati, collected and placed under the direction of Archibald Blue, Deputy Minister of Agriculture of that Province, such exhibit having formed a place at the Centennial Exposition of the Ohio Valley and Central States, which opened on the 4th July last, and which will remain on exhibition to October 27th next. In the introduction, the invitation for the Government of Ontario to take part in this Exposition is alluded to as showing the kindly sentiment which prompted it, "especially in view of the fact that, once parts of one territory, Ontario and Ohio are neighboring commonwealths of almost equal age, largely similar in climate, products and institutions, peopled by the same great race, and having a common record of pioneer annals." A synoptical sketch of the mineral resources of the province, with its geological features prefaces the catalogue, and statistics of the mining industry and its products, together with exports and imports of the products of the mine, give a most comprehensive idea in the smallest possible space of what Ontario is doing. Mr. Blue remarks in speaking of the extent and richness of many of the mineral deposits of Ontario that "their nearness to the great manufacturing cities of the United States is an assurance of their future value." The appendix to the catalogue contains directions to the public for the transaction of business with the Crown Lands Department, and for the purchase of land under the Mining Act. The text of the latter is given also in full, and a list of the economic minerals of Ontario with the localities in which they exist, arranged in scientific order, both being especially useful for reference. The catalogue by means of these additions beyond a bare list of exhibits has thus been made a concise mineralogical handbook of the natural resources of the province, and besides its usefulness as a guide book to visitors to the Exposition, its contents will tend to draw attention to the great resources we naturally possess, and is really by that means a very useful adjunct to the propaganda in circulation for immigration purposes. The concise yet comprehensive description given by Mr. Blue is well worthy of remark, and is a new departure from the old style of catalogue, simply explanatory of the objects exhibited, which may with good effect be used in similar works hereafter published by governments, corporations, or individuals.

## LETTERS TO THE EDITOR.

We invite Correspondence upon matters consistent with the character of the REVIEW.  
Be as brief as possible. The writers name in all cases required as a proof of good faith.  
One dozen copies of the issue containing his communication will be mailed free to any correspondent on request.  
We do not hold ourselves in any way responsible for the opinions expressed in this section of the REVIEW.

### Mr. Shirley's New Process of Treating Crude Phosphate as a Fertilizer.

NEW BEDFORD, Mass., Aug. 18th, 1888.

The Editor

THE CANADIAN MINING REVIEW:

SIR,—Some time since I promised to furnish you with an account of the results obtained from using the crude ground phosphate after being treated by the process of which I gave you some information in the early part of the year. Press of business has prevented my being able to give this subject attention until now, but the delay has not proved any detriment to the progress of the trials, and only confirms the results as being the more assured than if it had been reported on at an earlier date.

The tests have been only on a limited scale, but the results have been so marked that it has put the value of the material as a fertilizer beyond all question. On tender house plants it must be used most sparingly, otherwise it forces the growth so as to make the plant overgrown and weak; the trial on some celery beds has proved a marked success, the heads being fully 20 per cent. larger without destroying the crisp tenderness which is so desirable in this plant. Several nurserymen are taking the matter in hand, and are following up a series of tests, so that by the fall I hope to be able to give full and specific directions for all purposes to assure its proper use and to obtain the best results, as with an article of this kind the abuse of it might probably do it more harm in its introduction than good. From experience thus gained we look to the reserve power of the so called insoluble portion of the material to be of lasting benefit to future crops, as by the process of disintegration which is constantly going on, especially during the winter months, the ground will be rendered richer and ensure beneficial results in the following season. It will, of course, take several seasons to make its merits known and convince the skeptical of its true value; but, with the qualities contained in this article, its continued use will remove all doubts and make it the accepted medium for fertilizing in the future. If once thoroughly introduced the demand will continue to increase.

Trusting the material will become as widely known as it deserves for the benefit of all engaged in the phosphate industry.

I am, yours truly,

FREDERICK S. SHIRLEY.

GEOLOGICAL SURVEY CAMP,  
DU LIEVRE RIVER,  
Ottawa County, 19th Aug., 1888.

The Editor

THE CANADIAN MINING REVIEW:

SIR,—In your last issue appears a statement regarding the work I am now prosecuting in this district under instructions from Dr. Selwyn, the Director of our Survey, which gives a very erroneous idea of its nature and objects.

In view of the new material brought to light

by the developments made during the last few years on the phosphate deposits, and the greater facilities for study now afforded by the opening up of the industry of the district, it has been deemed to supplement the work already done in this direction by the Survey by undertaking a further detailed investigation into the nature of these deposits and of the rocks associated with them.

The topographical measurements now being made by my assistant, Mr. Jas. White, are undertaken simply with a view to the collection of data sufficiently detailed and accurate for the construction of a map on the large scale necessary for the working up and representation of the geological details brought to light by the investigation commenced last month.

I am, Sir, yours, &c.,

ELFRIC DREW INGALL,

Mining Geologist

to the Geological Survey of Canada.

### Soluble and Insoluble Phosphates.

A. H. Ward, Boston.

Another comparative experiment with phosphate made by the Pennsylvania State College Experiment Station confirms experiments made by the New Jersey Experiment Station and many others, and shows that the less soluble and cheaper forms of phosphoric acid are likely to prove equal or superior to the more costly soluble acid phosphates.

The results of these various experiments should be well known by the various experiment stations, and, if they are known, what justifies them in making so great a difference in value as 400 per cent. between soluble and insoluble phosphates? It all comes out of the farmers.

A bulletin of the Pennsylvania State College Experiment Station gives the results of experiments made with phosphates in a four-crop rotation in the years 1883-7, the first year's crops being grown without manure, to determine the relative fertility of the several plots. The plots were twelve in number, each of them one-twentieth of an acre in extent, and the soil is what is usually called limestone clay. Oats were grown in 1883, and the product showed considerable variation in the fertility of the several plots. Taking 100 as the average of all, they ranged from 91.62 to 114.52, eight being under the average and four over it. The rotation was in the order of wheat, grass, corn and oats, and the fertilizers were applied to wheat and corn only—the grass and oats getting the residual effects. Two plots were unmanured throughout the experiment, and from the results of these the values of the fertilizers were computed. The experiments were made to study the effects of different forms of phosphoric acid, and to guard against failure from a lack of any of the elements of plant food, each of the plots, except the two unmanured ones, as treated to 200 pounds of muriate of potash and 240 pounds of sulphate of ammonia per acre. They were thus supplied with nitrogen, potash, sulphuric acid and chlorine, while the limestone soil contained a vast excess of lime, magnesia and iron above what the crops could possibly use. Two of the plots received no other manuring, and the remaining eight were treated in pairs as follows:

1. 200 pounds dissolved boneblack, the phosphoric acid largely soluble.
2. 200 pounds dissolved boneblack, previously treated with lime; phosphoric acid largely reverted.

3. 150 pounds fine ground bone.

4. 150 pounds ground South Carolina phosphate; phosphoric acid largely insoluble.

These fertilizers were all standard articles of trade. Now for the results. Of the 56 single cases recorded, 36 show unmistakable gain resulting from the use of phosphoric acid, six show a probable gain, eight a doubtful gain, and the remaining six an apparent loss. But the results give no satisfactory proof that one form of phosphoric acid is superior to another. It would appear, however, that a limestone soil is not the most suitable for a phosphate fertilizer, owing to the circumstance that it precipitates the superphosphate so quickly as to prevent due distribution to the roots of plants. A comparison of the results obtained in the experiment with the results of other experiments appears to justify the conclusion that "upon lime soils, upon very light sandy soils, and upon pure peat soils, the less soluble and cheaper forms of phosphoric acid are likely to prove equal or superior to the more costly soluble acid of the superphosphates. But the director of the Pennsylvania station wisely enjoins caution in departure from established practices. A few simple and inexpensive trials of reverted or insoluble phosphates on a small scale would readily show one contemplating their use whether they were likely to prove profitable under these circumstances or not. No general rule can apply to every soil."

### Mining in Newfoundland.

The first copper mine was opened in Newfoundland in the year 1864. So rapid was the development of copper mining that in 1879 the total ores of copper and nickle exported amounted to \$4,629,889, and Newfoundland reached the position of sixth among the copper producing countries of the globe. The first copper mine opened was at Tilt Cove, situated on the north side of Notre Dame Bay, six miles south-west of Cape Joan, and two hundred and twenty-five miles north-west from the City of St. John's. Here the coast is very high and precipitous, and Tilt Cove is formed by a narrow opening which widens into a circular space in which there is a small fresh water lake. This space is surrounded by steep hills and rocks, and with the exception of the narrow opening to seaward, does not exceed three-eighths of a mile in diameter. In this space and on the west side of the neck of land separating the sea from the small lake, mining operations were commenced, the workmen's houses, offices and stores being around the small lake. At the close of 1879 this mine had yielded 50,000 tons of copper ore, valued at \$1,572,154, and nickle ore worth \$32,740. It was eclipsed in 1875 by Bett's Cove mine, from which in four or five years no less than 125,556 tons of ore were taken, valued at \$2,982,836.

The price of copper began to decline and went down lower and lower, there being a glut in the market. Tilt Cove mine became less remunerative, and mining was carried on in a languid way for a time and finally was discontinued. The general impression was that the best of the workings had been exhausted and that little ore remained. In all, it had yielded 70,000 tons of ore. In 1878, a new and wonderful deposit of copper ore was discovered at Little Bay, which left all previous discoveries in the shade. It presented great facilities for working, and here mining was and still is carried on upon an extensive scale. Tilt Cove was almost forgotten and was believed to be "played out." It was placed on the market

by its proprietors who were still impressed with its value, and believed that far more ore still remained than had been extracted. The price of copper, however, was low and for a time no purchaser appeared. At length the French copper syndicate took the field, and the price of ore bounded upwards. The mine was speedily purchased for £80,000 sterling, certain parties having an agreement which gave them the option of buying at that price. The speculation was a lucky one for them. A few weeks afterwards they sold it to the representatives of the syndicate for £160,000 stg., or \$768,000. Workings have recommenced vigorously, and this summer a large number of miners are at work. The explorations of experts have proven that the main deposits of the ore have hardly been touched, and that a vast quantity of ore awaits future operations. Once more we have a confirmation of the statements made during many years past, that this island will one day be a great mining centre, its undeveloped mineral resources being very great.

This mining property at Tilt Cove is an instance in point. At the beginning of this year, and in view of purchasing, a mining engineer of experience was sent out from London to report on it. In his report he says that in what is known as the East mine there is a mass of copper and iron pyrites of extraordinary dimensions.

"This has been cut by an adit level, driven from the north slope of the hill in a southeast direction, through massive chloritic and micaceous schists and slates 430 feet when the north wall of the mass was found, bearing north 45 degrees east (nearly) and having a slight underlay to the northwest. The mass of pyrites has been cut at a right angle to the north wall 136 feet without finding the south wall. It has been opened from east to west 62 feet over all, and there is no appearance of an end of it in any direction. The whole mass is quite homogeneous; there is no mixture of any rock matter in any part of it. There is at present room for men enough to break 2,500 tons a month, and which amount may be increased as the vein is farther opened out. The vein may be driven till the south wall is found; and the height from the adit to the surface, in the centre of the mass, is about 100 feet, a large portion of which would be available as soon as the shaft can be got through it. By the present system of working I estimate the cost of putting the ore on board ship at \$2.50 per ton. This includes all and every expense."

Even this is not all. The same property includes another called the "Long Pond Mine," two miles west of Tilt cove, where there is an extensive vein which has only been slightly explored. A shaft has been sunk on it thirteen fathoms, and seventy tons of ore carrying 11 per cent. of copper has been shipped from the stuff broken in sinking. Another mining engineer of high standing said in his report: "It would be difficult to find a mining property, in any other part of the world, with such an enormous amount of mineral in sight; and I see no signs of exhaustion notwithstanding several hundred thousand pounds worth of ore have already been extracted."

The mine first worked, the profits of which during the whole time of working amounted to £60,000, is now full of water, but it is not improbable that it will be pumped out and the workings resumed. But there are lying around this old mine, immense dump piles which have been thrown away. An engineer has estimated these piles at 200,000 tons, out of which could be picked 50,000 tons which would give 5 per cent. of copper; and a further treatment would reduce it to 20,000 tons of 12½ per cent. copper ore for shipment or smelting. He calculates that a clear profit of £12,500 sterling would be realized on the treatment of these dump piles, which had been thrown aside as useless rubbish. When a single mine, and by no means the

largest, yields such returns as these, can it be doubted that in the future this island will be the scene of large mining operations! It is in connection with the serpentine series of rocks that these copper ores are found, and that series covers 5,097 square miles. Lead and silver ores have also been found in many localities, and gold has also been discovered, but as yet only in small quantities. The copper ores, however, are by far the most valuable and extensive. Professor Stewart, an American expert of eminence, said in his report, after visiting the mining region: "I have never seen finer copper ore in the course of my experience. The character of the rocks in which it occurred was such as to give an absolute assurance of perpetuity in the working. Judging by the laws which govern mineral deposits, the depth of the veins in many places is such as to render them practically inexhaustible. I have not seen a more promising field for copper anywhere."



**Markets.**

Prices in the United Kingdom and the continent remain about the same as quoted in our last issue.

**Shipments.**

Phosphate shipments from Montreal for month ending August 18th, 1888:—

Date.	Ship.	Destination.	Shippers.	Tons.
July 10	Ciree.....	Glasgow..	Lomer, Rohr & Co.	159
17	Colina.....	do.....	"	249
20	Escalona.....	Dundee....	"	220
24	Canopus.....	Liverpool..	Wilson & Green..	407
25	Jas. L. Hamray	Bristol....	Lomer, Rohr & Co.	200
Aug. 1	Muroiano.....	London...	Wilson & Green..	170
1	Bothall.....	do.....	Millar & Co.....	312
4	Cremon.....	Hamburg..	Wilson & Green..	127
4	do.....	do.....	Lomer, Rohr & Co.	125
6	Lake Superior.	Liverpool..	"	246
13	Fremona.....	London....	"	220
13	Chateau.....	do.....	"	421
13	do.....	do.....	Millar & Co.....	109
13	do.....	do.....	Wilson & Green..	216
13	Lake Nepigon	Liverpool..	Lomer, Rohr & Co.	335
13	do.....	do.....	Millar & Co.....	130
17	Oxenholme....	do.....	"	80
17	do.....	do.....	Wilson & Green..	435
<b>Total.....</b>				<b>4,134</b>

**RECAPITULATION.**

SHIPERS.	
Lomer, Rohr & Co.....	2,157
Wilson & Green.....	1,365
Millar & Co.....	622
DESTINATIONS.	
Liverpool.....	1,673
London.....	1,439
Glasgow.....	350
Hamburg.....	252
Dundee.....	220
Bristol.....	300

**Du Lievre.**

The navigation of the Lievre river at Little Rapids is causing no end of trouble and expense to the phosphate miners of the district. The contractors of the new lock and dam are very tardy in their operations, and up to the present have so bungled what little work they have done as to completely alter the channel of the river at this point. At present very lightly laden scows have great difficulty in getting over, and the shipments from the mines are consequently very much retarded. The tardiness of the contractors in the construction of these very desirable works is the theme of many bitter remarks at the mines.

During July about 1,300 tons of high grade and 400 tons of "seconds" were shipped from High Rock for the English market. The pits look well, and everything goes on much as usual at these mines. Shipments for August have been very much hindered by low water at the Rapids. A telephone from the main buildings to the landing, a distance of a mile and a half, has recently been constructed.

A little girl, the daughter of one of the miners, had a portion of her hand blown off a few days ago, at these mines, by the explosion of a cartridge.

The tramline and other improvements at the Canadian Phosphate Co.'s Mines are rapidly nearing completion. A goodly quantity of ore has been mined. The management have, we believe, struck good ground at a depth of 140 feet in their "big" pit. From 160 to 170 men are employed.

A very large quantity of "seconds" awaits shipment at the Dominion Co.'s wharves.

We are requested to state that there is no truth in the statement that the Phosphate of Lime Co. are negotiating for the purchase of the Emerald.

**Perth District.**

The Anglo-Canadian Phosphate Company continues to meet with success in mining on the contract system at the Otty Lake Mines in North Burgess, and the Bobb's Lake Mines in Bedford. At the latter place four men took out 52 tons in five weeks, and their success has brought in a number of contractors, all of whom so far have readily found good shows. A considerable proportion of the phosphate obtained consists of crystals. The company have had prospecting done on the lots at the west end of the Gore of Templeton, and a number of promising shows have been opened. These are being let out to contractors to work, and a good output is expected. It is proposed to call the property "The Lake Tassie Mines."



We shall be greatly obliged to mine owners and superintendents for such authentic reports of their operations as may concern shareholders and the public.

**Nova Scotia.**

At the Drummond colliery operations have been very seriously retarded by a "crush" (a difficulty frequently met with in extracting pillars). Every effort has been made to find work for the men thus thrown out of employment.

The Acadia Company have extended their main hoisting slope down to the new lift which was sunk some time ago. This makes the main slope at this colliery the longest in the province hoisted by one lift, the total length being over 3,000 feet.

At the Albion mines the work of sinking the English slope to the Cage Pit seam is still continued, although rapid progress cannot be recorded. The pumps at the Food Pit are still out of order, and although the water in the pit has been reduced to within 40 feet of the bottom, months will probably elapse before the bottom is seen.

Since our last the diver working at the buckets of the Ford pit pump met with a curious accident which nearly cost him his life. While down in the pump shaft he missed his rubber wrist-bands, and was returning to a temporary stage which had been erected, to put them on, when nearing the top of the ladder he missed his footing, and fell back head-first into the water. In his endeavors to right himself he got fast under the air pump platform. The three men who were attending the diver, finding that they could not extricate him from his perilous position, decided that the only chance of saving his life was to hitch the rope of the winding engine to the life line around his body. The engine was started, and by a steady pull landed the diver safely on the pump platform. He escaped without injury, excepting a slight bruise in the back, caused by the force of the engine tightening the life line.

A discovery of coal is reported from Five Islands. Mr. Nickum, of St. Louis, Mo., one of four American capitalists owning large timber limits in the vicinity, has engaged Mr. Edward Wilkinson, an experienced miner, who holds a manager's certificate, to open up the new seam.

Recent newspaper despatches state that the Lawson coal mine near Meccan, Cumberland Co., has been sold to Montreal capitalists. We are in a position to state that the rumour has no foundation in fact.

In boring for water at Spring Hill mines, two large seams of coal were found in a southeasterly direction from the present, in a locality where the existence of coal had been unsuspected. This discovery will add greatly to the value of Spring Hill properties.

At Chignecto mines two seams have been recently struck at the outcrop—both of good size, neither of which had been previously discovered or worked, it is believed, on that area. They give promise of being good coal. In this connection speculation is again rife as to the probable existence of another field of coal south of any of the Joggins seams hitherto prospected.

Mr. Wadsworth has brought in from his Caribou mines, a fine brick of 214 ounces from 111½ tons.

We understand, says the *Critic*, that a wealthy English syndicate, introduced to this country by Mr. James C. Ashton, has purchased the Lochaber Gold Mine from Mr. John H. Anderson and others. The Lochaber district is a comparatively new one, situate between the Fifteen Mile Stream fields and the Salmon River Mine. No mine has hitherto been worked there. The prospecting shafts look very well, and show a good body of ore which should yield at least one ounce of gold to the ton. A stamp mill will be erected at the mine forthwith. Six cwt. of ore sent to England for treatment produced the extraordinary result of twenty-eight ounces of gold to the ton. Notwithstanding the fact that test assays are not always the best guide as to the value of a mine, we know enough of this one to predict such a satisfactory return that more English capital will be attracted to these long-neglected gold fields. Mr. C. H. Cox, of Liverpool, who represents the syndicate, is an artist of no ordinary ability, and his pencil, brush and camera have been kept busy during his visit of inspection. Some of his sketches will appear

in one of the English illustrated papers, and they will no doubt convey to the stay-at-homes some idea of our beautiful Nova Scotian scenery. If this second precious infant of Mr. Anderson's proves as healthy and flourishing as his first (the Oxford Mine, Lake Catcha), it will only be just recognition of his long and untiring services in striving to place the gold mining industry of the province upon a sound and firm basis.

Mr. D. Rattie, superintendent of the Dufferin Mine, Salmon River, is the first one to arrive with July gold. He brought in 279 ounces.

A bar weighing 141 ounces is the result of the first crushing at the Northup mill, Central Rawdon.

Work at the Greener-Ingraham iron seam, Cape Breton, is being actively pushed. Three shafts have already been sunk, one to a depth of 15 feet, which contained 14 feet of ore. They have also traced the lead to the shore. A wharf is about being erected for the shipment ore, and in about three weeks those in charge expect to be in a position to raise 100 tons per day. They have recently opened two other shafts quite a distance apart and have found the ore equally as good.

#### New Brunswick.

The coal fields of the Grand lake region of New Brunswick are said to be practically inexhaustible and should be explored. The rapid increase of railway mileage in this province makes it especially desirable that the facts respecting her coal be scientifically and thoroughly tested by boring.

#### Quebec.

The natural gas wells at St. Gregoire were visited recently by Dr. R. C. Selwyn, Director of the Geological Survey of Canada, says the *Montreal Star*. The doctor is quoted as saying that there is a strong flow of gas at the wells, and that the gas burns well and the supply is large. He thinks that a thorough examination of the gas supply should be made. The proprietors, it is said, are negotiating with American capitalists with a view to have them take hold of the well for the purpose of utilizing the gas. The gas was discovered in 1885 by Mr. Porier, M. P., of St. Gregoire, who organized a small company and sank a shaft on Mr. Trudel's property, which yielded a fair quantity of gas from a depth of 115 feet.

Very valuable deposits of porcelain clay are shortly to be worked by Mr. E. Duval, merchant, of St. Peter street, Quebec. A professional analysis has been made of some of the product taken from near the surface and good results are promised. The works will be opened back of St. Urbain, near Baie St. Paul. Samples shown promise exceedingly well.

Operations have been resumed at the Nailon Gold Mine, near Luckingham, seven or eight men having been set to work, with Mr. John Haley as foreman. A shaft is to be sunk to a depth of twenty feet, which, it is thought, will penetrate the richer portion of the workings. The syndicate are more than ever convinced that they have struck a good thing, judging so from the increased richness of the output. If the results of the next assay prove encouraging they will put on a large force of men and work the thing for all it is worth.

#### Ontario.

The oil well on the property of Mr. J. Lalonde, located about a mile north of the railway at Comber, near London, is steadily overflowing. The oil, which is of black color, and very thick, comes from a depth of 1,300 feet. Mr. Lalonde puts up about half a barrel per day.

The Hungerford Marble Company shipped during the month two cars of Bridgewater marble to Chicago.

At the cleaning up on Tuesday, the 10th instant, of a lot of seven tons of rock from the Richardson Gold Mine, the yield was found to be from \$40 to \$60 per ton, which is highly satisfactory. The prospect is so encouraging that additional capital will be invested and a crushing mill erected.

#### Sudbury District.

On Friday, 10th instant, the Ontario Mining Commission visited the Vermillion Mining Company's property at Whitfish, and while there made observations and took evidence in Denison. There were present Messrs. A. Blue, Dr. Bell, W. H. Merritt and Monaghan. On Monday, the 13th, they began operations in Sudbury, meeting here Mr. Coe, and being joined next day by Mr. Charlton. While here they visited the several mining locations under the Canada Copper Company, and took evidence of several of their officers, as well as that of prospectors and others engaged in this district. The evidence of Dr. C. D. Peters, General Manager, was complete and concise, as well as most interesting. Among prospectors several were examined, and the information was elicited that Mr. James Stobie was developing two properties, one of argentiferous galena, and one of a pyritous ore with galena carrying a good value in silver and gold. That Mr. Kettyle had a good promise in argentiferous and auriferous galena. And that others had made discoveries of veins of copper, the nickel-bearing pyrrhotite, and gold quartz, as well as galena. They visited the Stobie, the Copper Cliff, and Eyre (now Evans) mines. In each of these locations development is progressing most favourably, and stock fast accumulating for the smelting works, which Dr. Peters hopes to have in running order by November.

The Vermillion Mining Company are now developing three shafts, one in copper and two in gold. At the copper shaft the surface material yields considerable gold, besides some metals apparently of the platinum group, which are also contained in the copper and nickel ore at the bottom. The management are sinking through this deposit which will be developed by drifting at a later date. No. 2 shaft is being enlarged, and a new shaft, No. 3, is being sunk on a very promising vein within a quarter of a mile of No. 2, to the south-east. The vein matter of this shaft yields about \$18 per ton in silver and gold. This company have adopted the praiseworthy policy of permitting prospecting on their property (about 2,000 acres) on payment of a royalty.

In Graham, Chicago parties have been sometime at work, and are now meeting with encouragement. This, we hope, will rapidly develop into a well paying gold quartz.

Many prospectors have returned now that the fly season is past, but there is still room for many more, and we hope to see things assume a more business-like aspect before long.

A statement in some of the daily papers to the effect that the new smelting works to be erected by the Canada Copper Co. will cost \$1,500,000 is contradicted by Mr. R. Hedley in the *World*. He writes:

"In conversation to-day Dr. Peters said he should be very sorry if it cost one-thirtieth of that figure. An instance of the cost of the erection may be cited to show how absurd such statements are. A year ago the Calumet and Hecla finished their new smelting and refining plant at Lake Linden, Mich. They have a complete smelting and refining plant of the most substantial kind. Their buildings are mainly of stone, and no expense was spared to make them perfect in utility and appearance. They include fine docks with every facility for loading and unloading. The cost of this beautiful plant was \$500,000."

#### Port Arthur District.

There has been an unusually large influx of mining men into this region during the past month, the stages to the mines being crowded daily.

The Mining Commission appointed by the Ontario Government are expected to reach Port Arthur on the 19th instant, when a large amount of valuable mining information will be obtained.

Some of the more promising silver finds are quietly changing hands. There have also been a few sales of cheap properties.

There is a large amount of iron lands on Hunters Island being located, and an odd location for gold.

The continued favourable development of the Beaver, Badger, Silver Mountain, Silver Fox, Caribou and Crown Point Silver Mines assures the success of silver mining as a permanent industry.

There is considerable stir in the lead region east of Port Arthur, around Black Bay. Several of the properties are being developed by capitalists who have them bonded with a view to purchase at large figures.

Numerous prospects are being worked on a small scale for silver by private parties of small means, some of which will eventually attract the necessary capital to make them worthy of a name.

The Government are gradually settling the various disputed claims which were up before their Commissioner, and the successful applicants are consequently jubilant.

#### Manitoba and North-West Territories.

Letters patent of incorporation have been applied for by the "Sebaskong Lumber and Mining Company," with a capital of \$22,000 and chief place of business at Rat Portage.

#### British Columbia.

The shipments of coal for the month of July from the twin ports of Nanaimo and Departure Bay, are the largest yet attained in the history of coal mining in the Nanaimo District. The total shipment amounted to 40,158 tons, loaded into 26 vessels. This amount does not include the Provincial trade, such as supplies to the local steamers, and the home consumption of the Province. The value of the exports of coal for the month of July is placed at \$140,553 for custom purposes. This increase in the shipment of coal has caused a corresponding increase in the number of residences erected in Nanaimo and the Wellington settlements.

The news that has arrived by way of Victoria, B.C., of the explorations of Mr. Ogilvie, who, while surveying the far North-west of Canada on behalf of the Dominion Government, wintered on the Yukon, is very gratifying. He explored the Yukon for 700 miles and found it very rich in gold and silver, some of the miners making large sums. This result is only a fresh instance of the fact that the more Canadian territory is explored the richer is it found to be. This is the case even in localities which have been supposed to be most unpromising. The British Columbian "sea of mountains," of which we once heard so much, turns out to be exceptionally rich in minerals, clothed with luxuriant forests, with which fertile agricultural lands are interspersed, while its coasts teem with fish of the most valuable kinds.

#### The Coalfields of Cape Breton.

By E. Gilpin, Jr., F.G.S., F.A.S.C., Inspector of Mines.

The popular idea is that a coal mine is a hole in the ground, and a coal field a section of country uninteresting from heaps of coal refuse, and the unpolished manners of its inhabitants.

A closer survey, however, shows that the "hole in the ground" exercise the highest engineering and technical skill of those who conduct the operations connected with sinking them, and extracting the coal with the minimum of cost. The manners of the miners, if marked with a certain reserve toward strangers, are those of men whose occupation differ from the callings of ordinary humanity; and among themselves they are friendly and charitable and ever ready to dare the dangers of the mine if a comrade calls for help. When the figures of the statistician show that the power and wealth of a nation is directly measured by the number of tons of coal produced and consumed, the subject acquires a general and vivid interest. Coal fields seem to be a special gift of Providence to nations, and curiously enough the English-speaking races have the lion's share of coal fields, and have well availed themselves of their privileges.

The extraction and exportation only of coal however is not a permanent source of wealth. The treasures of the mine resemble more those of the forest, than the treasures of the field and of the sea. Every ton of coal when it leaves the country represents, in most cases it is presumed, a certain amount of profit, but its removal increases the cost of the extraction of the next ton, and like a tree of the forest it cannot be replaced. It must be used locally to smelt the ore, forge the metal, ply the loom, or to build the multifarious machinery demanded to-day, before its true value is seen. One man can dig a ton of coal, but two must toil before it has yielded up its many items of power, or heat, or light. Take the mother country, did she export all her coal, and close the myriad factories supported by it, her position would be vastly different.

The few introductory remarks I am permitted to make should however be directed rather to the geological than the economic side of my paper.

Could the student carry himself backward, beyond the time of Confederation, to the period of the formation of the Cape Breton coal beds, and take his stand on the granitic hills of Cape Dauphin, at the entrance of the Bras d'Or lake, his eyes would wander over a view widely different from that of the present day. Instead of the rolling hills covered with spruce undergrowth, and occasional ridges of hardwood which now stretch eastwardly from Sydney to the shores of

the ever-encroaching Atlantic, he would see, mile upon mile, a dead monotonous level, with here and there dull sluggish reaches and swamps of dark peaty waters, while overhead the rays of a sun warmer than that now allotted to us, could scarce dissipate the clouds of vapor it kept drawing from the heated water and steaming soil.

On a nearer approach, this uninteresting country, which we would compare to some of the tidal marshes of the Bay of Fundy, is found to be covered with the densest of vegetation. No modern forest, tropical or temperate, reproduces the curious scene. A closer study, however, would detect some trees bearing a fanciful resemblance to plants now growing in the earth. There was one tree specially beautiful, its towering stem sometimes nearly one hundred feet in height, was fluted like a temple column, and crowned by magnificent fern-like fronds, a mysteriously-developed tree fern. Its roots descending into the marshy ground radiated, divided and sub-divided until they could suck nourishment rapidly for the great tree above with its quick growth and frequent branch-making.

There is also another tree with peculiarities now characteristic of the "club mosses," but its branches were flung wide in the air, and it appeared to the casual observer like a mighty pine.

Yet another curious plant recalls our "mare's tail," but its fluted bamboo-like stems were often forty feet high.

In those pre-historic forests of twenty millions of years ago, there was scarce a temptation for the little children to wander as Babes in the Woods, for nature, rioting in luxuriant growth, did not deign to captivate by the exhibition of the fleeting colors and fragrances which poets have sung and nations admired. In vain would search have been made for any plant now called national: the rose, the thistle, and even the humble emblem of our Province, all were wanting, and perchance only the mosses and fungi relieved the sombre colors of that "Dismal Swamp."

In vain would the hunter, so far as the records of the rocks inform us, have searched for his prey, in the air, or by land, or by sea. Locusts, beetles, scorpions, nondescript frogs or newts, all labored in their task of subduing, consuming and consolidating the great masses of vegetation. However, it must be said that these remarks are based on negative evidence only, the plants and insects from which our imagination has reconstructed so curious a page in the history of mother earth, are few in number, and owe their preservation as fossils to peculiar circumstances. There may have been many other organized helpers in the great scheme on the hills and highlands surrounding the marshes, and imagination may depicture the graces and beauties and the melodious sounds of an untrodden land.

Such were some of the curious forms that were crowded in the battle of life which left victors and vanquished preserved for our sole benefit. The plants grow and fell, and were buried, the water of the swamps allowing but a tardy decomposition, until a deep peaty mass accumulated. The sub-soil, a clay or loam, was filled with rootlets until perhaps no further mineral nourishment of silica or of potash, etc., was available. Long years this swamp, devoid of living vegetation, lay gradually undergoing changes consisting chiefly of elimination of water from the vegetable matter, until some oscillation of level, perchance a change in the current of some by-gone river unannounced and

unsung deposited on its partly hardened surface a layer of silt or mud. This went on until hundreds of feet of sandstone, shale, coal, fireclay, etc., are now presented. The accumulating mass in the slow course of time became firm. Pressure, the internal heat of the earth, chemical laws of change all combined to make the peaty mass a layer of carbon with a small percentage of ash, and of bituminous forming matter: the sand layers were cemented by silica into hard sandstone, the mud into bituminous or carbonaceous shale; and the ancient soil well robbed of its alkali; and silica became fireclay.

Almost without exception every bed of coal the miner explores has immediately below it a bed of fireclay often filled with carbonized roots. The coal bears in its structure the evidence of its vegetable origin, for under the microscope can be seen in it, fruits, flowers, and particles of wood fibre, etc. Above the coal comes the roof usually of shale or sandstone, often bearing in it at the junction with the coal bed, layers of ferns, pressed and preserved as in a herbarium; or a full length tree of that ancient forest showing in its flattened stem clearly and distinctly its species, etc., and recalling with its darkened color the logs found in our peat swamps.

We have now briefly traced the coal seam to its full growth, but had nature gone on adding the coral, the chalk, and all the varied and immense layers of subsequent formations this precious heritage would have been like an estate in chancery, pleasant to think about, but a thing unattainable, for we could not have sunk shafts some four or five thousand feet to provide our fuel.

The process of nature which has laid these stores of fossil fuel close to the surface in Cape Breton is one as yet little understood by geologists, but it is a subject fascinating from its grandeur, and to its operations do we owe all our mines. There have been elevations and depressions in the earth's surface ever since its creation, caused by internal forces, contraction of its crust, accumulation of sediments, or what not, we see the effect, and bless the hand that guided the cause. In the Sydney district it appears that the old, old rocks, the granites and gneisses of Coxheath, Boisdale and St. Ann's were forced slowly and gradually upwards. This motion forced a tilting of the strata holding the coal so that they inclined to the east-ward. This was continued until the "Atlantic" of that date came in upon the land, and had boundaries approximating those of the present day.

(To be continued.)

\*Transactions of the Mining Institute of Scotland, vol. ix, pp. 135-145.

†From "The Carboniferous of Cape Breton:" a series of papers read at Halifax.

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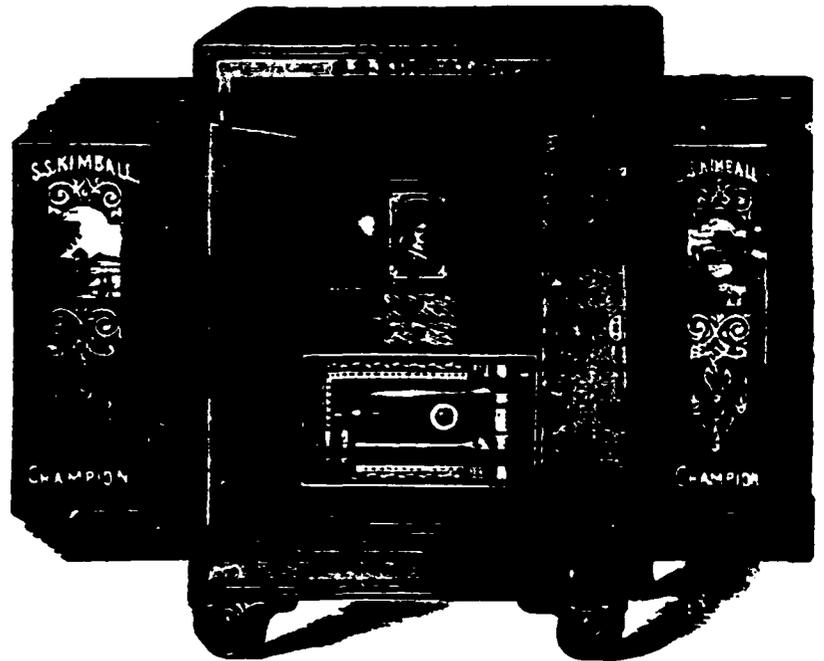
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IN THE TOWNSHIP OF BUCK-  
INGHAM, COUNTY OF  
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1st.—Lot 28, in the 6th range, containing 100 acres, in addition to the salina of the lake.

2nd.—North half of lot 23, in the 5th range, containing 100 acres.

3rd.—Nine acres of lot No. 28, in the 5th range, with water privileges thereto appertaining, being site of mill dam, etc., etc.

The property formerly belonged to the Montreal Plumbago Mining Company, and was worked successfully for several years, until the company's mill was destroyed by fire, but the mill dam remains almost uninjured, and there are on the property several houses, sheds, etc., built for various purposes when mining operations were carried out.

**The Plumbago Deposits**

upon the property are regarded as amongst the richest and most extensive in the Dominion. As to the quality of the Plumbago, it has been extensively used in the manufacture of crucibles, lubricating leads, stove polish, etc., etc., and given unbounded satisfaction. This is established by the experience of consumers, and by a certificate from the celebrated Battersca Crucible Works, London, England, a copy of which is open for inspection.

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has also been discovered in quantities.

The lands are in the Phosphate region, and recent prospecting has disclosed a rich and extensive deposit of this mineral. There are unrivalled facilities for transporting the ore to and from the mines by the Ottawa River and C. P. Railway. Distance from mines to Railway Station 6 miles. Good road.

All that is required to make these valuable mines handsomely remunerative is a little capital and enterprise.

The Title is Indisputable.

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**TOWNSHIP OF ASCOT.**

- 1st. Clark Mine, Lot 11, R. 7 Ascot ..... 187 acres
- 2nd. Sherbrooke Mine, part Lots 12 and 13,  
R. 7 Township of Ascot..... 329 "
- 3rd. Belvidere Mine, part Lots 9 and 10, R.  
9 and 10, R. 8 Ascot ..... 292 "
- 4th. Mining Rights in same vicinity on..... 250 "

All of the above properties lie within 1½ miles of the Village of Lennoxville, at the junction of the Grand Trunk, Canadian Pacific and Passumpsic Railways, and have been developed to a considerable extent, and veins opened 6 to 20 feet in width, yielding 3 to 5 per cent. of copper, also silver, and 35 to 40 per cent. of sulphur. These mines are only 2½ to 3 miles distant from the City of Sherbrooke, and evidently are of the same class of ores found at Copelton, only four miles distant, owned and worked by the Orford Copper and Sulphur Company, and by Messrs. G. H. Nichols & Co., of New York, which have proved so remunerative.

**TOWNSHIP OF ORFORD.**

5th. Carbuncle Hill Mine, Lots 2 and 3 R. 14, and 2, 3, 4 R. 15, 718 acres. Same class of ore as is found in the Ascot properties above described, but yielding a higher percentage of copper.

**TOWNSHIP OF CLEVELAND.**

6th. St. Francis Mine, ¼ Lot 25 R. 12, 50 acres, with dwelling houses, smith's shop, ore sheds and office, large winding and pumping steam engine, with boiler, winding and pumping gear, and about forty fathoms Cornish lifting pumps complete, railway tracks, ladders, etc., situated three miles from Grand Trunk Railway. A considerable amount of mining work has been done at this mine. A well defined vein richly charged with vitreous purple and yellow sulphurets of copper traverse the entire length of the property, five feet in thickness, yielding 8 to 40 per cent. metallic copper.

**TOWNSHIP OF GARTHBY.**

7th. Fifty-six lots of land, 2,938 acres. This property for the most part is unexplored, but copper is found on the greater part of the property. On one of the lots a vein about twenty feet in width has been found. Samples of the ore have yielded as much as 22 per cent. of copper, being also rich in sulphur. Other samples of pyrites from the same property, free from copper, have yielded as high as 48 per cent. of sulphur. The only drawback to this property is in its distance from the railway, it being about four miles from Garthby Station, Quebec Central Railway. A new line is chartered, however, which, when built, will run directly through the property.

**TOWNSHIP OF ACTON.**

8th. The Acton Mine, 100 acres, with engine, boiler, pumps and appliances. Within three years after this mine was first opened it produced nearly \$500,000 worth of copper. It is situated about half a mile distant from the stations of the Grand Trunk and South Eastern Railways.

9th. Brome Mine, part Lots 2 and 3 R. 4, 50 acres.  
10th. Bolton Mine, two miles from Eastman Station, Waterloo & Magog Railway, 400 acres.

The above properties formerly belonged to the Canadian Copper and Sulphur Company, and were acquired by the present owner at sheriff's sale, giving an indisputable title thereto.

The whole or any portion of the property will be sold at reasonable prices.

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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 contains 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 same 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 each 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, or collected under the provisions of the Adulteration Act, or is transmitted to the chief analyst for analysis.

If the fertilizer is put up in packages, every such package intended 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 sample of the same shall have been transmitted to the Minister of Inland Revenue and the provisions of the foregoing sub-section 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 inspectors 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 or 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 entitled, "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, as well as a copy of a Bulletin which it is proposed to issue in April, 1888, concerning the fertilizers

**E. MIALL,**  
15th Dec., 1887. Commissioner.

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General Offices, Ottawa.

**Centennial Exposition**

—OF THE—

**Ohio Valley and Central States,**  
**CINCINNATI,**  
July 4th to Oct. 27th, 1888.

The Province of Ontario will be represented at this great Exposition with an exhibit of its Minerals and Mining Products, embracing the

**Precious Metals, Economic Minerals, Building and Monumental Stones, etc., etc., etc.**

All expenses of freight and exhibition will be borne by the Government, and as the time for making a suitable collection of articles is short it is hoped that persons interested in the display of the Province will co-operate in making it as large and full as possible.

Owners or managers of mines, quarries and reduction or manufacturing works are invited to communicate with the undersigned at Toronto, by whom full instructions respecting the exhibits will be given.

Articles intended for the Exposition should reach Toronto not later than the 20th of June, when they will be examined and classified for shipment to Cincinnati.

**A. BLUE,**  
Commissioner for Ontario.  
Department of Agriculture,  
Toronto, 8th May, 1888.



**INDIAN LANDS**

LANDS IN THE UNDERMENTIONED localities are offered for sale to actual settlers through the following Indian Agents: On the Great Manitoulin Island, Lake Huron, Ontario; Mr. J. C. Phipps, of Manitowaning, is the Agent for the sale of lands in the following Townships on this Island: Assiginack, Bidwell, Howland, Shequandah, Billings, Campbell, Carnarvon, Allan, Tehkummah and Sandfield, and in the Townships of Shequandah, Manitowaning and Shaftsbury (commonly called Little Current). Mr. B. W. Ross of Cockburn Island, is the Agent for the sale of lands on that Island and in the Townships of Gordon, Mills, Burpee and Barrie Island, and in the Township of Gore Bay as well as for those in the Townships of Robinson and Dawson, on Manitoulin Island. Leading roads have been constructed throughout the Great Manitoulin Island.

On the Saugeen Peninsula, Ontario, the land in the Townships Amabel, Albemarle, Keppel, Eastnor, Lindsay and St. Edmunds; as well as several Townships in the Peninsula, are offered for sale through Mr. William Simpson, Indian Lands Agent at Wiarton, County of Bruce, Ontario.

On the Garden River Reserve, Ontario, Mr. William Van Abbott, of Sault Ste. Marie, is the Agent for the sale of lands within this tract, and which are situated in the Townships of Macdonald, Laird and Meredith; also for lands within the tract commonly known as the Batchewara Bay Indian Reserve, and comprised in the Townships of Aweres, Fenwick, Kars, Pennefather, Dennis, Herrick, Fisher, Tilley, VanKoughnet, Tupper and Archibald. There is a leading road through these lands which affords ready communication with other parts of the country to intending settlers.

The condition of sale in respect to the lands within the Townships above described can be ascertained on application to the respective Agents.

(Signed) **L. VANKOUGHNET**  
Deputy Supt. General of Indian Affairs.

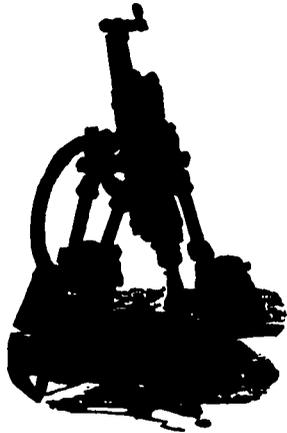
Department of Indian Affairs,  
Ottawa, February, 1887.

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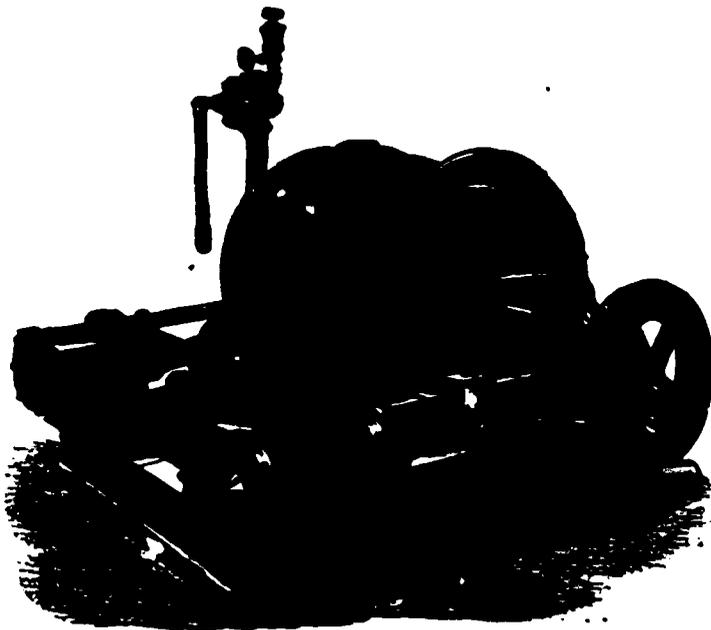
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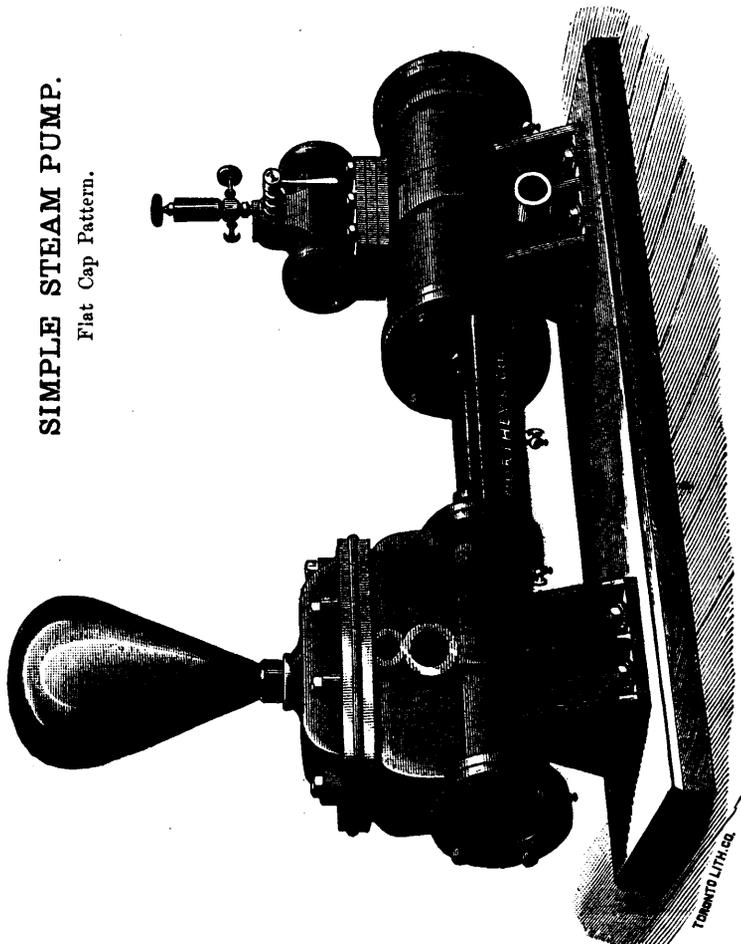
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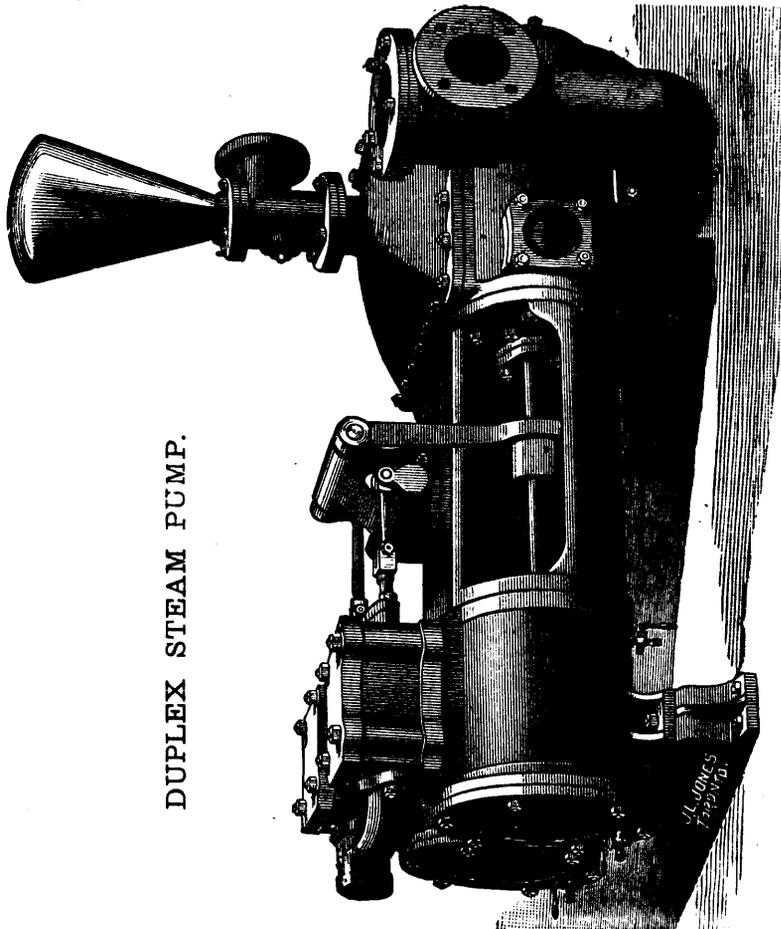
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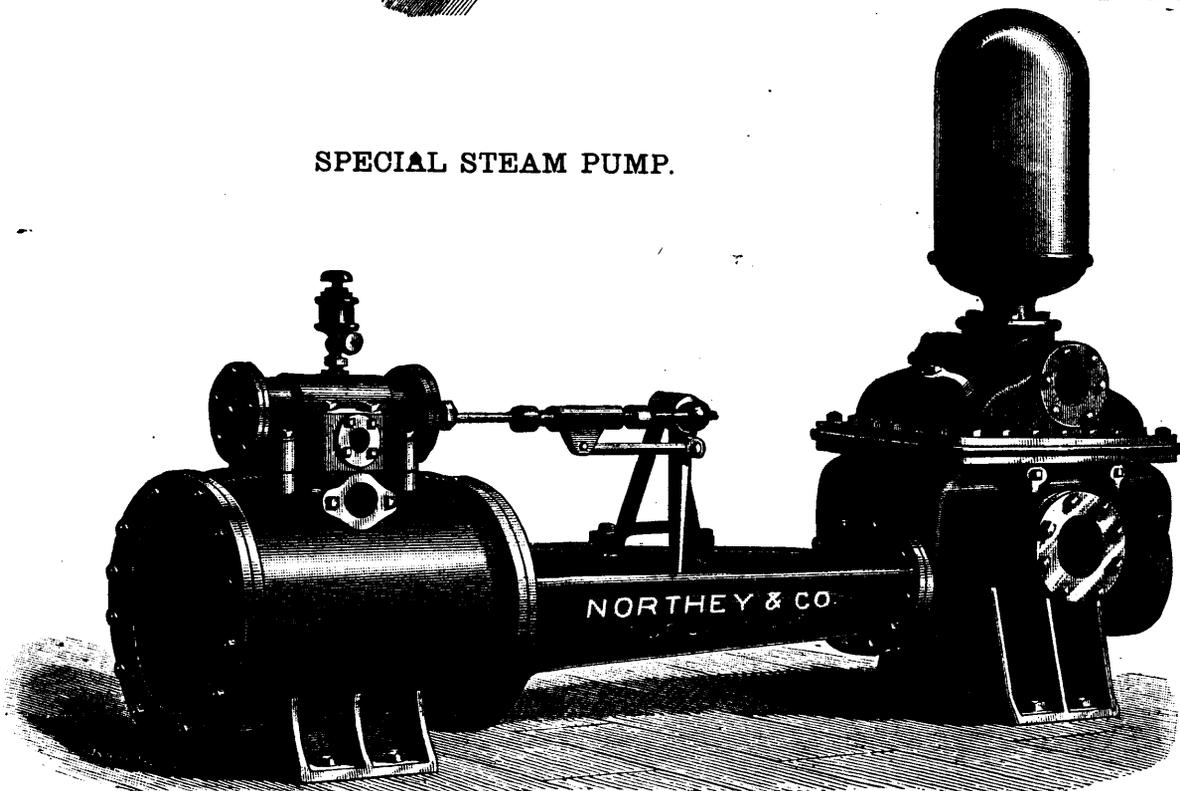
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# Mining Regulations

TO GOVERN THE DISPOSAL OF

## Mineral Lands other than Coal Lands, 1886.

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

Any person may explore vacant Dominion Lands not appropriated or reserved by Government for other purposes, and may search therefor, 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 a 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 Mining.

Any person having discovered a mineral deposit may obtain a mining location therefor, in the manner set forth in the Regulations which provides 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 Land Office for the district in which the location is situated, a declaration or oath setting forth the circumstances of his discovery, and describing, as nearly as may be, the locality and dimensions of the claim marked out by him as aforesaid; and shall, along with such declaration, pay to the said agent an entry fee of FIVE DOLLARS. The agent's receipt for such fee will be the claimant's authority to enter into possession of the location applied for.

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

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

No more than one mining location shall be granted to any individual claimant upon the same lode or vein.

### IRON.

The Minister of the Interior may grant a location for the mining of iron, not exceeding 160 acres in area, which shall be bounded by north and south and east and west lines astronomically, and its breadth shall equal its length. Provided that should any person making an application purporting to be for the purpose of

mining iron 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 of August, 1886, be re-marked and re-entered in conformity with the Regulations without payment of new fees in cases where no existing interests would thereby be prejudicially affected.

### PLACER MINING.

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

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

The Regulations apply also to

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

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

### THE SCHEDULE OF MINING REGULATIONS

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

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

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

**A. M. BURGESS,**

*Deputy Minister of the Interior.*

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